

## PROCEEDINGS OF THE SOCIETY

### Minutes of Meeting

#### Boston Society of Civil Engineers

February 16, 1972:— The regular monthly meeting of the Society was held jointly with the Hydraulics Section of the Society at the Red Coach Grill, 43 Stanhope Street, Boston. This was the annual John R. Freeman Lecture. The members gathered for cocktails at 5:30 P.M., and dinner of London Broil or Baked Schrod was served at 6:30 P.M. Ninety-six attended the dinner.

At 7:15 P.M. President Ernest A. Herzog called the meeting to order.

The President declared that the Minutes of the January 19, 1972 meeting would be published in a forthcoming issue of the Journal and that the reading of those Minutes would be waived unless there was objection from the floor.

The President called upon the Secretary for any business that he may have. Secretary Dunkerley moved, it was seconded and voted "that the Board of Government of the Boston Society of Civil Engineers be authorized to transfer a sum not to exceed \$8,000.00 from the Principal of the Permanent Fund to the Current Fund to meet Current Expenditures".

President Herzog called upon the Secretary for any announcements. The Secretary stated that applications to membership had been received from the following:

Robert L. Plum, Medway, Mass.  
 Hubert De Biche, Braintree, Mass.  
 Joseph D. Guertin, Jr., Reading, Mass.  
 Dean K. White, West Brookfield, Mass.\*  
 Richard S. Cook, Hingham, Mass.\*  
 Herman R. Weinberg, Stoughton, Mass.\*

\*Transfer from Junior

The Secretary then informed the members present that the Board of Government had met earlier in the afternoon. At that meeting the following had been elected to Membership in the Society:

*Grade of Member:* Thomas C. Anderson, Hector Zayan-Bazan, Richard E. Bender, George R. Bird, Domenic T. Bua, Rich-

ard F. Desrosiers\*, Paul A. DiPietro, Robert E. Germain, Joseph A. Handziak, Gino L. Mastrobattista, Albert B. Pincince\*. Christian A. Wethe\*.

*Grade of Junior:* Arnold F. Thibault, John F. McFarland, James W. Weaver

*Grade of Student:* Paul J. Trudeau, Thomas L. Brown

\*Transfer from Junior

President Herzog declared that the business portion of the Society meeting was ended and turned the meeting over to Mr. Albert G. Ferron, Chairman of the Hydraulics Section to conduct any necessary business for that Section. Mr. Ferron informed the membership that this was the Annual Meeting for that Section. A slate of officers was presented and elected.

President Herzog introduced Prof. Leslie J. Hooper, Chairman of the John R. Freeman Fund Committee. Prof. Hooper informed the membership that this was the seventh Annual John R. Freeman Memorial Lecture and that the Committee had selected Prof. Ven Te Chow of the University of Illinois an acknowledged authority on this subject to prepare a paper for presentation to the Society at this meeting. Prof. Hooper introduced Dr. Chow to the membership.

Dr. Chow presented an interesting and timely dissertation on the various techniques which had been used for hydrologic modeling. The paper had been submitted for publication in a forthcoming issue of the Journal.

Following the formal presentation there was a brief question and answer period.

One hundred members and guests were present at the meeting following the dinner.

The meeting adjourned at 9:40 P.M.

Paul A. Dunkerley  
 Secretary

March 22, 1972:— The 124th Annual Meeting of the Boston Society of Civil Engineers was held today in the Morse Auditorium, Science Museum, Science Park, Boston, Mass., and was called to order at 4:10 P.M. by President Ernest A. Herzog.

President Herzog stated that the minutes of the January and February 1972 meetings would be published in a forthcoming issue of the Journal. He declared that the minutes of the March, May and June 1971 meetings had been published in the Journal.

President Herzog called upon the Secretary for announcements. The Secretary announced that at the Board of Government Meeting held March 20, 1972, the following had been elected to membership:

*Grade of Member:* Hubert DeBiche, Joseph D. Guertin, Jr., Robert L. Plum, Herman R. Weinberg\*, Dean K. White\*

\*Transfer from Junior

The Secretary further announced that application for membership had been received from the following:

Gerald F. Conklin\*, Hyde Park, Mass.  
Richard S. Cook\*, Hingham, Mass.  
Charles H. Horstmann\*, Yarmouth, Maine  
William P. Kennedy, Lexington, Mass.  
James J. O'Reilly, Chelmsford, Mass.

\*Transfer from Junior

The annual reports of the Board of Government, Treasurer, Secretary and Auditors was presented. Reports were also made by the following committees: Publication, Hospitality, Library, John R. Freeman Fund, Ralph W. Horne Fund, Subsoils of Boston, Membership, Advertising, Joint Legislative Affairs, Public Relations, B.S.C.E.—A.S.C.E. Relations, and B.S.C.E. Quarters Committee.

It was VOTED "that these reports be placed on file".

The annual reports of the various sections were read and it was VOTED "that the annual reports of the various Sections be placed on file".

President Herzog stated that the reports from the committees and sections would be published in the April 1972 Journal.

The Tellers of Election, Peter K. Taylor and Samuel E. Rice 3rd, made their report on the results of the ballots, and in accordance therewith the President declared the following had been elected officers for the ensuing year:

|                      |  |
|----------------------|--|
| President            | James P. Archibald                                       |
| Vice-President       | Peter S. Eagleson  |
| Secretary            | Joseph F. Willard  |
| Treasurer            | Robert T. Colburn  |
| Directors            | Charles C. Ladd<br>Charles H. Flavin<br>Leland F. Carter |
| Nominating Committee | Arthur H. Mosher, Jr.<br>Allan Grieve, Jr.               |

President Herzog then made a few announcements concerning the dinner meeting.

Following a 5-minute recess President Herzog delivered the Presidential Address entitled "Transportation — The Development of Minimum Design Functions". Thirty-five members and guests attended the business meeting.

The meeting adjourned at 6:00 P.M., to reconvene following the social hour and dinner.

President Herzog called the adjourned meeting to order again at 8:20 P.M. Following general remarks and the introduction of guests and officers at the head table President Herzog turned the affairs of the meeting to the awarding of prizes.

The Secretary stated that the Ralph W. Horne Fund was established in 1964 by a gift from the Directors of Fay, Spofford & Thorndike, Inc., the income of which would be devoted to a prize or certificate to be awarded annually to a member designated by the Board of Government as having been outstanding in unpaid public service in municipal, state or federal elective or appointive posts; or in philanthropic activity in public interest. The Secretary stated that the recipient of the award this year was Prof. Earle F. Littleton, and asked the recipient to step forward. President Herzog presented Prof. Littleton the Ralph W. Horne Award which was a certificate reading as follows:

RALPH W. HORNE FUND AWARD  
 Presented by the  
 BOSTON SOCIETY OF  
 CIVIL ENGINEERS  
 to  
 EARLE FREDERICK LITTLETON

Devoted educator, dedicated and competent Civil Engineer for his untiring efforts for a period of years in local government and committee work, and more particularly for his outstanding contribution to good government by his diligent service on sensitive state boards, the

Board of Government  
 of the  
 BOSTON SOCIETY OF  
 CIVIL ENGINEERS  
 has elected him to be the  
 Seventh Recipient  
 of the  
 Ralph W. Horne Fund Award

and this certificate is proudly presented to him March 22, 1972.

Paul A. Dunkerley                      Ernest A. Herzog  
 Secretary                                      President

The Secretary announced the endowment conditions for the prizes which would be awarded and called upon each of the recipients to step forward to receive the prize awards as follows:

April 26, 1972:— The monthly meeting of the Boston Society of Civil Engineers was held jointly with the Transportation and Geotechnical Sections at the Red Coach Grille, 43 Stanhope Street, Boston, Mass. The meeting followed a social hour and dinner.

The meeting was called to order at 7:30 P.M. by Chairman Robert T. Tierney of the Transportation Section. After conducting the business of the Section, Mr. Tierney called upon Mr. Edmund Johnson, Chairman of the Geotechnical Section to conduct any business of his section. There being none, the meeting was briefly turned over to

| <i>Award</i>     | <i>Recipient</i>                   | <i>Paper</i>  |
|------------------|------------------------------------|---|
| Clemens Herschel | Eliahu Traum<br>Waclaw P. Zalewski | “An Analogy to the Structural Behavior of Shear Wall Systems” |

|  |   |
|--|---|
| William P. Morse<br>Scholarship<br>Desmond FitzGerald<br>Scholarship | James A. Stern<br><br><br>Patricia Curran |
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President Herzog then introduced the guest speaker of the evening, Mr. Bradford H. Washburn, Director Science Museum. Mr. Washburn gave a most interesting illustrated talk on the Mapping of the Grand Canyon. Following the talk President Herzog presented the retiring Secretary, Paul A. Dunkerley, with a certificate of appreciation for his services as Secretary of the Society. President Herzog then turned the meeting over to President-Elect James P. Archibald who presented the retiring President Ernest A. Herzog, with a certificate of appreciation for services rendered.

The meeting adjourned at 9:00 P.M.

One-hundred thirty-four members and guests attended the dinner and meeting.

After the meeting members and guests were conducted through the Planetarium and then adjourned at 10 P.M.

Joseph F. Willard  
 Secretary

President James R. Archibald.

President Archibald stated that the minutes of the 124th Annual Meeting of the Society held on March 22, 1972 would be published in the Journal and that the reading of those minutes would be waived unless there was objection. No objection was heard.

President Archibald then called upon the Secretary for announcements. The Secretary announced that the following had been elected to membership in the Society at the meeting of the Board of Government on April 20, 1972:

*Grade of Member:* Gerald F. Conklin\*, Richard S. Cook\*, Charles H. Horstmann\*, William P. Kennedy, James J. O'Reilly

\*Transfer from Junior

There being no further business to transact, Chairman Tierney introduced the speakers for the evening:

Mr. Walt Hansen, Boston Transportation Planning Review

Mr. William Wachter, Howard, Needles, Tammen & Bergendoff

Mr. Stiles Stevens, Charles A. Maguire Associates, Inc.

Mr. Morse Klubock, Perini Corporation, Marine Division

These gentlemen made an excellent presentation on the subject "The Proposed Third Harbor Crossing", which reviewed the various need studies as well as construction, location, and other problems associated with the subject. Following the presentation by the panelists there was a question and answer period in which the audience showed considerable interest.

Fifty-two members and guests attended the meeting, which was adjourned at 9:00 P.M.

Respectfully submitted,  
Joseph F. Willard  
Secretary

#### COMPUTER SECTION

February 2, 1972:— Gerald Woodland, Meeting Chairman, called the 4th Annual Meeting of the BSCE Computer Section, meeting with the ASCE Local Section, to order at 7:40 at the Playboy Club of Boston. Sixty-five members and guests were present. Gerry first urged that the questionnaire on meeting, places, time and topics handed out to each person present be returned either at the meeting or to Al Rimer.

The meeting was then turned over to Al Rimer for conduct of section business. Al then called upon Gerry Woodland for the report of the nominating committee which consisted of the three past and present chairmen of the section. Gerry then presented the nominations from the nominating committee as:

Chairman Robert D. Logcher

M.I.T.

Vice-Chairman David Hellstrom

Arthur D. Little Co.

Clerk Charles Shaker

Fay, Spofford & Thorndike, Inc.

John Christian, M.I.T.

Jekabs Vittands, Metcalf & Eddy  
Al Rimer, Camp Dresser & McKee

Al asked for nominations from the floor and when none was offered asked and received a motion to close the nominations. He then asked Gerry Woodland to cast a single vote for the slate.

The annual report was then presented by the Section Chairman. Al reported that in this 4th year of the Section, the impending merger with ASCE has been anticipated and has tempered progress by its delay. In reviewing activities Al described a survey of time sharing and batch processing vendors which is currently underway. The results of this survey are to be made available to all Society's friends and members and possibly published in the ESNE Newsletter or the Society's Journal. The questionnaire is currently under final review. Plans are also underway to computerize some of the Society's records, billings, mailing list, etc.

The meeting chairman then called upon the chairman-elect, who presented on behalf of the Section, a token of the esteem held by the members toward the past and present chairman of the Section for establishing and building the Section into a viable communication mechanism in a field so important to all society members.

Gerry Woodland then introduced speakers of the evening. Introducing a panel of vast technical and management experience including:

William Theon — from a structural engineering firm.

Joseph Heney — from an environmental consulting firm.

Edwin Cameron — from an engineering design & constructor.

Joseph Heney from Camp Dresser & McKee was then introduced. Mr. Heney began by describing his firm. With 470 people working in the environmental engineering field, his firm was a partnership until the start of 1971 at which time it became a corporation. In breaking down the operation of CDM, Mr. Heney mentioned the existence of a computer department and an advisory committee on computers. The advisory committee has broad membership from all aspects of the firm and advises on activities of the computer department. CDM's hardware consist of a 16K IBM 1130 with RJE and plotting capabilities. Systems currently on line include payroll with printed checks and government forms, accounting including labor distribution and job cost accounting, also excess deficit reporting which compares profit/cost to fee and profit sharing and retirement record keeping. Many small tasks such as telephone list are also maintained with the aid of the computer. Some CPM work is also done. The computer group is currently working on additional accounting functions which include account payable, account receivable and personnel records.

Bill Theon of LeMessurier Associates was introduced next. Mr. Theon, in explaining that he would describe his firm's use of computers for job control, described LeMessurier Associates as a small firm interested in using computers at a human level. As consultant to architects on buildings and foundations, they considered their primary computer use to be associated with engineering.

Typical time curve on job costs shows a typical job profile. Job expectations could then be plotted and compared against data collected for an actual job. This task was first performed by hand and has for the past four years been computerized. Exception reporting based on progress by 10% increments brings progress to management's attention.

Also with 300 active jobs in the office at one time, manpower projection is a real problem. For each job week by week a cumulative record of the job is developed. Such records have led to the typical job profile with information collected by type,

size and architect involved in the project. With the job profile and phasing this can be integrated over all jobs to project manpower for the next 12 months on work in hand. Typical results of these projections were presented and evaluated. Cumulative accuracy was found to be within 7%. Such a system is being used to project manpower and work needs. Cash flow can also be discerned from such reports.

Mr. Edwin Cameron of Stone & Webster was introduced next. He described Stone & Webster as mostly in the power plant business. Engineering and construction was performed on an integrated basis. The firm did design, construction and purchasing, all simultaneously. The development of a single fossil fuel power plant now took approximately 6 years from inception to operation; in a nuclear plant, more than 9 years. Increased complexity and control requirements and problems of supplier and laborer reliability required tighter control by management. Stone & Webster is currently introducing a network base time/cost/manpower system. Mr. Cameron described Stone & Webster as a large size firm producing in 1971 on its work in hand 2 million man hours of design.

Mr. Cameron then described the planning process in Stone & Webster. These involved: Organization - overall planning; Project breakdown structure - assignment of responsibility; Work and resource plans - CDM; Plan/schedule - currently using PMS/360 in batch processing mode.

Management activities were considered hierarchical in the firm. Operating downward from the owner, the design disciplines and the drawing production has led to the need for a series of production control systems. The systems are identified as: Employee Information (resource); Production Management (schedule); Work Flow Management (control). The first of these currently operational.

Mr. Cameron then described the system design process at Stone & Webster involving: Object phase; Design of system; Conceptual definition; Definition in detail; Design (coding); Operational (start up).

System operation was then described involving data entry using tape cassettes,

and on line interactive use, using a system called Ramis operating with a time shared Service Bureau. The employee information system includes: Staff profiles; Experience profiles; Wage profiles; Skill profiles; Personnel profiles; for each employee of the company.

The conceptual phase for the production management system has recently been completed. The following aspects of the system were described: Planning - Scope of work; Plan; Estimates. Control - Status reports; Predictive reports.

The conceptual phase of the work flow management systems will start in 1973. It is envisioned as dealing primarily with documents including documents outside of Stone & Webster's drawings.

Gerry Woodland then opened the meeting to questions from the floor. Al Rimer first asked Mr. Cameron how to educate management on computers. Mr. Cameron described user-oriented education at Stone & Webster which was heavy on network based techniques. One thousand people have been put through a planning, progress, and control course including some of their clients. Ed Morley of Stone & Webster asked Mr. Heney how much development was done in house in their firm. Mr. Feldman, replying for Mr. Heney, described that major packages were contracted with outside firms while staff was being built in house. Now the in house staff does most development. This approach resulted from a desire to modify rapidly any of their software.

Carl Gates asked Mr. Theon the impact on the loss of graphics with computer usage. Mr. Theon replied that 15 minutes of hand plotting needed to be done. He could not justify a plotter for this small amount of work. Bob Feldman then asked Mr. Theon what the historical data source was for manpower projection, only payroll or other sources. Mr. Theon explained that the first pass came from payroll data. The second pass allowed the engineer to override any projections. Mr. Rimer then asked Mr. Theon of the size of the review group reviewing exceptions. This was described as 14 associates and partners in Cambridge. They found BIG BROTHER job monitoring

system to be effective. Joe McCommick of CDM asked Mr. Theon how they dealt with special projects that did not fit their historical profiles. They were described as being dealt with individually with the user utilizing the override capabilities in the system. No network basis was used. Leo Frowley asked Mr. Theon if experience has increased the accuracy and impact on product engineers. Mr. Theon said they were working on improving accuracy. He felt the problem was getting people to use results from such a computer system. Mr. John Crosby from Stone & Webster then asked Mr. Theon for his thoughts on exception reporting. Mr. Theon felt that in a small office broad information access in communication was more of a way of life. Mr. Crosby asked if they could use exception reporting to delegate authority. Mr. Theon felt that a small firm such as his did not have the depth of organization to make this a problem. His type of organization is more parallel. Al Rimer then asked the panel if the system he was describing had impacted value in their firm. Mr. Cameron gave an unqualified "yes" and described an imperative need. Mr. Stelling of Thompson and Lichtner then asked the panel what unforeseen problems they encountered in the use of these systems. Mr. Cameron responded by saying that with a matrix organization, the manager in a problem area sees only the aggregate problem, primarily that with acceptance. Mr. Crosby replied that the computer division at Stone & Webster solves problems by setting up joint task forces. It works with users to gain user acceptance, user experience and promote communication. Mr. John Wells then asked if these firms had a formal computer staff of only engineers, trained for computer work. Gerry Woodland responded that Stone & Webster forecast working needs including the types of talents needed and got specialist, including computer systems people and operations research types. He felt that the key was to get people flexible enough to change to meet needs. Mr. Theon responded that his computer was managed by some trained both as an engineer and a computer specialist.

Gerry Woodland called the meeting to a close at 9:40 P.M.