CHANNEL

COMPUTERS AND INFORMATION SYSTEMS NEWSLETTER

Center for Information Studies, Graduate School of Management, University of California, Los Angeles

Spring 1976

R. Clay Sprowls
Director, Center for Information Studies

Bennet P. Lientz
*Chairman, Computers and Information
Systems Curriculum Committee*

E. Burton Swanson
Newsletter Editor

Barbara Beerstein
*Secretary and Assistant Newsletter
Editor*

With this second issue of the newsletter — the first was issued in Summer, 1974 — we continue our effort to disseminate information about C.&I.S. area activities in the Graduate School of Management to interested individuals and organizations. As before, comments and suggestions will be welcomed.

FACULTY ACTIVITIES

Professor BENNET P. LIENTZ is currently serving as Chairman of the Computers and Information Systems Curriculum Committee, and has been active in addition as Advisor on Scheduling and Information Systems to the Office of the Chairman of the Graduate School of Management. He is Chairman of the Computer Advisory Committee and served on the FTE Allocation Committee.

Professor Lientz has authored or co-authored a variety of papers which have been published (or accepted for publication) in recent months. These papers include "A Comparative Evaluation of Versions of BASIC" (Communications of the ACM), "An Operations Research Approach for the 'Design to Cost' of a Complex Radar System" (Israel Journal of Engineering), "Evaluation of Security Measures in a Computer Network" (with Ira Weiss, to appear in Computer Networks), "Modified Bayesian Approach to Reliability Testing" (chapter in Reliability Methods), "System Evaluation Techniques for Error Detection" (chapter in Minicomputers and Networks), "Computer Network Usage - Cost/Benefit Analysis" (chapter in Data Management and Computer Networking), "A Model for the Analysis of Computer Networks" (with J. Schenck and I. Weiss, submitted to Computer Networks), and "Computer Security: The Problems vs. SAS No. 3" (with I. Weiss, submitted for publication). His book entitled Computer Applications in Operations Analysis is in its third printing. He is currently working on three other books. One of these deals with the systems approach applied to humanities and will have a forward by the science fiction writer Ray Bradbury.

He is the Principal Investigator on a recently awarded Office of Naval Research Contract in the amount of $25,000, for research in system development and computer networks and data security. Working with him on this research are Burt Swanson and Gerry Tompkins.

Among other activities, Professor Lientz is an Associate Editor of the new journal Computer Networks, and a consultant to the Advisory Panel for Los Angeles County Data Processing and Atlantic Richfield Company. He is listed in Contemporary Authors, Who's Who in the West, and Biography of Western Leaders.

During the past year he has given several addresses to the Operations Research Society, IEEE, EDP Auditors Association, and Association for Computing Machinery. He has given a seminar on distributed processing at a conference held in Rio de Janeiro, Brazil. A presentation on computer security has been given at the International Conference on Computing in London, England.

Finally, he has recently written a program with Jim Schenck to assist faculty in selecting between retirement programs options.

Professor Lientz' position with the University was converted to Associate Professor (with tenure) in the summer of 1975. He received an accelerated merit promotion in 1976.

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Professor RICHARD O. MASON is presently completing a two-year leave of absence, serving with the National Science Foundation as Program Manager in the Advanced Productivity Research Division. He returns to the Graduate School of Management this coming fall.

While with NSF, Professor Mason has presented several invited papers at meetings of professional societies. "The Role of Dialogue in the Measuring Process" was presented at a meeting of the American Society for Cybernetics," in Philadelphia, during the fall of 1974. "Opposing Forces in Public Administration -- An Academic's Perspective" was given at the Fifth Annual Conference of the National Capital Area Chapter, the American Society for Public Administration, Washington, D.C., in November, 1974. "External Demands on Schools of Management" was presented to the Western Division of the Academy of Management, in Las Vegas, during March, 1975.

Professor Mason is the co-author of two recent books: Introduction to Enterprise: A Systems Approach (with Paul Kircher) and World Modeling: A Dialogue (with C. West Churchman).

Professor EPHRAIM R. McLEAN, on sabbatic leave during the fall and winter quarters (1975-76), has been active in three major areas: interactive computing for management, the application of computers to health care delivery, and computers and planning.

Since the introduction of interactive computing to UCLA in 1970, Professor McLean has played a major role in its adoption and use by the Graduate School of Management. Together with Professor Ken Siler and, more recently, Professor Burton Swanson, he has taught each of the incoming M.B.A. classes in the use of the computer and the programming language APL. In recognition of this, he was given a major grant by the IBM Corporation last summer to conduct a two-week course on "Interactive Computing for Management Educators." This program, drawing together business school faculty members from across the country, offered an extensive workshop in the use of APL for management purposes. As an indication of the interest in the program, nearly 200 application requests for the 24 openings were received. Ken Siler and Jim Schenck assisted Professor McLean in offering the course. As a part of the program, each of the participants wrote an APL program appropriate to his or her discipline and these programs are to be published as a GSM monograph under the title Management Applications in APL.

In the second area, computers in support of health care, Professor McLean has been working with Paul R. Torrens, M.D., of the UCLA School of Public Health. One of the results of this collaboration is the recently approved M.B.A. - M.P.H. concurrent degree program. This new program allows a student to obtain both the M.B.A. and M.P.H. (Master of Public Health) degrees in a period of three years rather than the four it would otherwise take if pursued separately. A second joint effort is the new program in Health Information Systems. This program, although located within the School of Public Health (and leading to an M.P.H. degree), draws heavily upon the Computers and Information Systems curriculum within GSM. It is designed to prepare information systems specialists in pro-

blems of health and health care delivery. Upon returning from sabbatic leave, Professor McLean was officially names as GSM's liaison to the School of Public Health.

In the third area, computers and planning, Professor McLean is attacking the issue involved from two sides, i.e., planning for computer systems and using computers to plan. As an outgrowth of the McKinsey-UCLA Conference in 1974 on Long-Range Planning for Information Systems, he has co-authored a book, Strategic Planning for MIS (Wiley Interscience, 1976), with John Soden of McKinsey & Co., Inc., co-chairman at the Conference. He will also be giving a paper of the same title at the National Computer Conference in New York in June. On the other side -- computer-based systems for planning -- he has begun a large study under the sponsorship of Planmetrics (On Line Decisions, Inc.) of Chicago. This study is aimed at measuring the extent of use of such systems within major American companies, whether the systems are purchased from vendors or developed in-house. It is hoped that the results will be ready by the fall of this year.

Professor McLean has also been busy with writing and making presentations to professional societies and management groups. In the last year or so, he participated in the ACM/ASM Spring Systems Seminar in Los Angeles and the ONR/Wharton Conference on Interactive Information and Decision Support Systems in Philadelphia. He also gave papers at the National Computer Conference in Anaheim and the ORSA/TIMS Joint National Meeting in Las Vegas. Finally, he continues to participate in the GSM Executive Program, giving a double session on information systems for management, as well as giving similar presentations to other management groups on a consulting basis.

Professor McLean was advanced to associate professor (with tenure) in the summer of 1975.

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PUBLICATIONS (SINCE JUNE 1974)

1. Swanson, E. Burton. "The System Realization Process," DMG-DRS Journal: Design Research and Methods, April-June 1974. Reprinted in CEDR Quarterly (Quarterly Publication of the Center on Evaluation Development and Research, Phi Delta Kappa), Winter, 1974.

2. Swanson, E. Burton. "An MIS Story," IEEE Transactions on Engineering Management, August, 1974.

3. Mitroff, Ian I., and Mason, Richard O. "On Evaluating the Scientific Contribution of the Apollo Moon Missions via Information Theory: A Study of the Scientist-Scientist Relationship," Management Science, Vol. 20, No. 12, August 1974, pp. 1501-1513.

4. McLean, Ephraim R. "An Appraisal of Computerized Life Insurance Estate Planning," The Journal of Risk and Insurance, Vol. 41, No. 3, September 1974, pp. 497-509.

5. Swanson, E. Burton. "Management Information Systems: Appreciation and Involvement," Management Science, Vol. 21, No. 2, October 1974, pp. 178-188.

6. Boulden, James B., and McLean, Ephraim R. "An Executive's Guide to Computer-Based Planning," California Management Review, Vol. 17, No. 1, Fall 1974, pp. 58-67.

7. Mitroff, Ian I., Nelson, John, and Mason, Richard O. "On Management Myth-Information Systems," Management Science, Vol. 21, No. 4, December 1974, pp. 371-382.

8. Swanson, E. Burton. "System Heroes," General Systems: Yearbook of the Society for General Systems Research, December, 1974.

9. Lientz, Bennet P. "A Stochastic Method of Allocation of Components to Maximize Reliability," IEEE Transactions on Reliability, 15, 91-97 (1974).

10. Lientz, Bennet P. Computer Applications in Operations Analysis. Englewood Cliffs, N.J.: Prentice-Hall, 1975.

11. Lientz, Bennet P., "Cost Trade-Offs Between Local and Remote Computing," 469-480, Computer Communication Networks, Grimsdale, R.L. and Kuo, F. F., (Eds.), Nordhoff-Leyden Publishing, 1975.

12. Kircher, Paul and Mason, Richard O. Introduction to Enterprise: A Systems Approach, Melville Publishing Co., 1975.

13. Sprowls, R. Clay. "Data Base Education for Students of Management," Proceedings, 1975 National Computer Conference, pp. 907-911.

14. Sprowls, R. Clay. "On Teaching about Data Base Management Systems," Proceedings, IFIP Conference on Computers in Education, IFIP, North Holland Publishing, 1975, pp. 609-614.

15. McLean, Ephraim R., Mason, R. O., and Foote, S. "Behavioral, Organizational Aspects of Computers, Allied Technology," Data Base, Vol. 6, No. 4, Spring 1975, pp. 15-26.

16. McLean, Ephraim R. "A Comparative Evaluation of Automated Medical History Systems," AFIPS Conference Proceedings, 1975 National Computer Conference, Vol. 44, AFIPS Press, Montvale, New Jersey, May 1975, pp. 733-738.

17. McLean, Ephraim R., Foote, S., and Wagner, G. "Medical History Questionnaires: A Bibliography of Manual, Automated, and Computer-Processed Techniques," Methods of Information in Medicine/Methodik der Information in der Medizin, Vol. 14, No. 3, July 1975, pp. 150-163.

18. Levy, N.S. and Lientz, Bennet P. "An Operations Research Approach for the 'Design to Cost' of a Complex Radar System," Israel Journal of Engineering, January 1976.

19. Siler, K. "A Socioeconomic Study of Publically Dispatched Ambulance Demand in a Large Metropolitan Area," Health Services Research, Winter 1976.

20. Siler, K. "A Stochastic Evaluation Model for Database Organizations in Data Retrieval Systems," Communications of the ACM, Vol. 19, No. 2, February 1976, pp. 84-95.

21. Lientz, Bennet P. "A Comparative Evaluation of Versions of BASIC," Communications of the ACM, April 1976.

22. Lientz, Bennet P. "System Evaluation Techniques for Error Detection," 115-118, Minicomputers and Networks, University of Liege Press, 1976.

23. Sprowls, R. Clay. "Data Base Education for Students of Management," DATA BASE, 1976.

24. Churchman, C. West and Mason, Richard O. (eds.) World Modeling: A Dialogue, North-Holland, 1976.

25. Sprowls, R. Clay. Management Data Bases, Santa Barbara, Wiley/Hamilton, 1976.

26. Swanson, E. Burton. "Computer Application System Development: Some Implications for Programming Practice," Data Management, May 1976.

27. McLean, Ephraim R., and Soden, John V. "Strategic Planning for MIS: A Conceptual Framework," AFIPS Conference Proceedings, 1976 National Computer Conference, 45, AFIPS Press, Montvale, New Jersey, (June 1976).

28. Lientz, Bennet P. "Modified Bayesian Procedures in Reliability Testing," in C. Tsokos (ed.), Bayesian and Nonparametric Methods in Reliability. (in press)

29. Lientz, Bennet P. and Weiss, Ira R. "Evaluation of Security Measures in a Network Setting," Computer Networks, (in press).

30. Swanson, E. Burton. "Information System Approaches: Directions for Research and Practice," Management Datamatics, (to appear).

31. Swanson, E. Burton. "The Application of Function Descriptors to the Development of an Information System Typology," Journal of the American Society for Information Science, (to appear).

32. Siler, Kenneth F. "Evaluating Operational Characteristics of an Emergency Ambulance System," Health Services Research (accepted for publication).

WORKING PAPERS (SINCE JUNE 1974)

Number	Author	Title	Date
1-75	Bennet P. Lientz	System Evaluation Techniques for Error Detection	8/74
2-75	Kenneth F. Siler	A Stochastic Evaluation Model for Data Base Organizations in Data Retrieval Systems	8/74
3-75	Kenneth F. Siler	A Cost/Effectiveness Approach to Evaluating Generalized Data Base Management Systems	9/74
4-75	Ephraim R. McLean Stefanie Foote	The Collection and Processing of Medical History Data: A Bibliography of Manual, Automated and Computer Processed Techniques	8/74
5-75	E. Burton Swanson	Computer Application System Development: Some Implications for Programming Practice	11/74
6-75	Israel Spiegler	Computer System Performance Evaluation: Techniques and Technology	11/74
7-75	Bennet P. Lientz Ira R. Weiss	On the Evaluation of Reliability and Security Measures in a Computer Network	11/74
8-75	Kornel Terplan	Reliability and Performance Evaluation of Computing Systems	11/74
9-75	Ephraim R. McLean	A Comparative Evaluation of Automated Medical History Systems	11/74
10-75	Kenneth F. Siler	A Socioeconomic Study of Publically Dispatched Ambulance Demand in a Large Metropolitan Area	2/75
11-75	Bennet P. Lientz	Some Experiments to Improve and Design Communication Networks	2/75
12-75	E. Burton Swanson	Some Data-Based Concepts and Definitions	2/75
13-75	Stanley C. Abraham	How to Appreciate Using a Structure of Feedback Loops: A Set of Instructions	2/75
14-75	Kenneth F. Siler	Computerized Ambulance Location Logic - Version II	5/75
15-75	Lin Gingras	The Psychology of Users and Designers of Information Systems: A Field Study	6/75
16-75	Kenneth F. Siler	A Planning Model for Emergency Medical Delivery Systems	8/75
17-75	E. Burton Swanson	A Sketch for an Executive Information System	9/75
1-76	Eric Flamholtz Ellen Cook Raj Nagaraj	The Cultural Side of Human Resource Accounting	10/75
2-76	E. Burton Swanson	The 'Sub O' Approach to Information System Development	11/75
3-76	Stanley Abraham	Tying Performance to Goals: An Information System Concept for the California Highway Patrol	1/76
4-76	Kenneth F. Siler	A Model for Simulating Complex Emergency Medical Delivery Systems	1/76
5-76	Kenneth F. Siler	Evaluating Operational Characteristics of an Emergency Ambulance System	2/76
6-76	Kenneth F. Siler	A Framework For Locating Emergency Medical Facilities	2/76
7-76	Bennet P. Lientz James W. Schenck	Experiments in Minicomputer Networks	12/76
8-76	Bennet P. Lientz James W. Schenck Ira R. Weiss	A Model for Performing Trade-Offs in Computer-Communication Networks	12/76
9-76	Bennet P. Lientz Ira R. Weiss	Effects of Security Measures on Network Performance	12/76
10-76	Ephraim R. McLean John V. Soden	Strategic Planning for MIS: A Conceptual Framework	1/76
11-76	Bennet P. Lientz	Evaluation of Network Services	2/76
12-76	Ephraim R. McLean	The Use of APL for Production Applications: The Concept of "Throwaway Code"	3/76
13-76	Bennet P. Lientz	A Comparative Evaluation of Versions of BASIC	4/76

ORDERING INSTRUCTIONS

Copies of available working papers may be ordered at the unit costs indicated. Enter the quantities desired from the list below, and mail your order, together with check payable to THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, to:

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9-75	$1.00	_____	9-76	NOT AVAILABLE	
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Dr. KENNETH F. SILER is continuing his intensive research into emergency medical systems. He has presented recommendations based upon his research to various county, state and local agencies at a countywide conference last summer, as well as to the Emergency Medical Care Committee of Los Angeles County. The Emergency Medical Care Division of Los Angeles County's Department of Public Health has adopted several of Dr. Siler's recommendations, based upon the research results. An additional presentation is being made this Quarter in Denver, Colorado, to various public agencies.

Dr. Siler is presently an advisor to the international journal, Information Systems, and has served as a reviewer for Communications of the ACM and several other publications.

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Professor R. CLAY SPROWLS is currently serving as Director of the Center for Information Studies.

A primary research interest of Professor Sprowls is in the area of data base management systems, and in the teaching of these systems in business/management schools. He is author of three recent papers and one book on the subject. The paper "Data Base Education for Students of Management" was given at the National Computer Conference, 1975. "On Teaching about Data Base Management Systems" was presented at the IFIP Congress on Computers in Education held in Marseilles, France, in August, 1975. "Data Base Education for Students of Management" will appear in a forthcoming issue of Data Base.

A review of the teaching approach appears in the February, 1976, Computer Newsletter for Schools of Business edited by Daniel Couger, University of Colorado.

A textbook Management Data Bases has been recently published by Wiley/Hamilton. It brings together the ideas presented in different papers to support an organized way to teach the DBMS subject matter.

Professor Sprowls has also initiated our current involvement with the ISDOS (Information System Design and Optimization System) Project, attending the ISDOS User Group Meeting at the University of Michigan in September, 1975. ISDOS is a project under the direction of Professor Daniel Teichroew at Michigan. It is a working system to aid in automated system design. A Problem Statement Language (PSL) is available with which to define the system requirements. A Problem Statement Analyzer (PSA) is available to process the PSL input and record it in a PSL data base as well as check for different kinds of definition errors. Once recorded in the data base, the system requirements can be changed, added to, updated, deleted, and otherwise manipulated by a command language, to build the system specifications interactively with the help of the computer. A variety of PSA reports are available for system documentation.

The Graduate School of Management is now an affiliate of the ISDOS project and has acquired   PSL/PSA for running at UCLA. During the Spring Quarter, Professor Sprowls incorporated the use of PSL/PSA into MGT 224C, Advanced Project in Computers and Information Systems, in an experimental way. He is now revising the course based upon the Spring Quarter experiences and developing further teaching materials for this important new tool to aid in system building.

With the availability of the PSL/PSA system, a number of research activities are being started. These tend to augment the work done by the Michigan ISDOS project staff in the direction of the management side of system building, extending investigations into the use of, rather than enhancements to the system. Three activities that are currently under way are:

1. A study that bridges the gap between system require-
   ment specifications in an automated system building
   environment (PSL/PSA) and implementation in a data
   base management system. Working with Professor
   Sprowls, Israel Spiegler is doing his dissertation as
   part of this study.

2. A study of the effect of PSL automated system build-
   ing aids on design and implementation, where the
   system requirements have already been fully specified.

3. A study of the effective use of alternative output
   reports from the PSL/PSA system by analysts in differ-
   ent design situations.

Professor Sprowls will be Vice Chairman of the Graduate School of Management, beginning this Fall.

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Dr. E. BURTON SWANSON is currently serving as Doctoral Advisor within the Computers and Information Systems Curriculum Committee.

Dr. Swanson joined the faculty in the Fall of 1974 as an Acting Assistant Professor. His primary teaching role has been with the courses MGT 225A, Introduction to Information System; MGT 225B, Information Systems for Planning and Control; and MGT 225C, Measurement in Information Systems.

Dr. Swanson was previously associated for two years with the Studiengruppe für Systemforschung, Heidelberg, Federal Republic of Germany, working in the area of information system design methodology and on the development of an information system typology. Prior to this, he was employed with IBM over a ten year period, working primarily on the development of computer applications. He has taught previously at San Jose State University and California State University, Hayward. His educational background includes a B.S. degree from San Jose State University (in Industrial and Systems Engineering), an M.B.A. from the University of Michigan (in Quantitative Methods), and a Ph.D. (in Business Administration) from U.C. Berkeley.

Working with Professor Lientz, Dr. Swanson is currently investigating problems of application software maintenance, supported by a contract with the Office of Naval Research.

Dr. Swanson is presently a consultant to the National Science Foundation and to the Studiengruppe für Systemforschung, Heidelberg.

As of July 1, Dr. Swanson will become a regular member of the faculty, having accepted an appointment as Assistant Professor.

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Dr. BARRY BOEHM of the TRW Systems Group and Mr. PAUL A. BRUNNER, Systems Research Director at Atlantic Richfield, have also taught courses with us in 1975/76.

STUDENT ACTIVITIES

ISRAEL SPIEGLER is currently completing his dissertation under Professor Sprowls, working on a methodology which links a system analysis package (ISDOS) with a commercially available data base management system (ADABAS). An information processing problem is defined using PSL, transformed into a general data structure form (Codd's relational model) and then translated to statements of ADABAS' data definition language. A gap in the information system life cycle is thus "closed" through computer application.

Mr. Spiegler has recently submitted a paper, "A Meta-Language for Relational Data Bases," for publication. He has accepted a faculty position in the School of Management at Boston University, beginning this fall.

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IRA WEISS has completed his dissertation, "The Implications and Effects of Data Security Measures in a Computer Network Environment," with distinction. He has accepted a teaching position at New York University for the upcoming fall.

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Other doctoral students who have completed, or are in the process of completing their theses are STANLEY ABRAHAM, VICKI CARLEN, and LIN GINGRAS.

Mr. Abraham presented the paper, "Tying Performance to Goals: An Information System Concept for the California Highway Patrol," to the Joint National Meeting of ORSA/TIMS, 17-19 November 1975, in Las Vegas. Mr. Gingras contributed "The Psychology of Users and Designers of Information Systems: A Field Study," to the XXII International Meeting of TIMS, July 24-26, 1975 in Kyoto, Japan.

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Mr. Kwan has been working on several individual projects while preparing his research paper. He has worked with Dr. Swanson on a project for the Studiengruppe für System-forschung, Heidelberg, developing an annotated bibliography on tools for information system development. As an extension of this project, he is working with Dr. Swanson and Mary Culnan on a design for a personalized computer-based bibliographic system.

Mr. Kwan has also worked on a project with Professor William Mitchell of the School of Architecture. The project involved the use of computer graphics to display a proposed oil drilling site in Los Angeles as part of the response to the oil company's environmental impact study filed with the Environmental Protection Agency and the city. Computer generated perspective drawings with hidden-lines removed were employed as a model of the oil site.

Mr. Kwan has worked in addition with Professor Arthur Geoffrion of the Graduate School of Management on the implementation of an analytical model developed as an auxillary model to larger and more expensive mixed integer programming models for facility location problems.

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STEPHEN KWAN, JIM SCHENCK, STEVE HARTMAN, WAYNE YACCO, and RON LEMOS successfully completed the Ph.D. major field examination this fall.

New doctoral students in 1975-76 were MARY CULNAN, LES PORTER, and HARRY FELDMAN. Ms. Culnan and Mr. Porter plan to take the major field examination this fall, as does KWEKU EWUSI-MENSAH.

New doctoral students in 1976-77 will be RANDY COOPER, STEVEN HUG, JAMES SMOOT, ALBERTO BENTO, and ARI SILVA.

Receiving the Burroughs Corporation Fellowship for 1975-76 were MARY CULNAN and STEPHEN HEARN.

VISITORS

A distinguished visitor to the Graduate School of Management in 1975/76 was Ms. ENID MUMFORD of the Faculty of Business Administration, Manchester University. Ms. Mumford contributed several seminars to faculty and students over the few weeks of her visit. She has done important research on aspects of the quality of working life of people involved with computer-based systems, and her stay with us was a most welcome one.

Dr. KORNEL TERPLAN, Head of the Systems Development Department, Computer Center of the Association for the Hungarian Telecommunication Industry, Budapest, Hungary, was also a visitor in 1975/76, pursuing post-doctoral studies in information systems. During his stay, he presented the paper, "Interaction Between Computing Systems Reliability and Performance Control Techniques," at the Eighth Hawaii International Conference on System Sciences.

Professor IAN I. MITROFF of the University of Pittsburgh was another visitor in 1975/76, presenting two seminars to faculty and students over a several-day period.

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Dr. KENNETH E. IVERSON of IBM and Mr. ALLEN J. ROSE of Scientific Time Sharing Corporation both payed brief visits to the Graduate School of Management this past year. Dr. Iverson led an informal discussion on the uses of APL with interested faculty and students. Mr. Rose contributed an APL overview to a special session of Management 433, Computing Laboratory, an introductory course required of all MBA students.

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Professor DANIEL TEICHROEW of the University of Michigan was also a recent visitor, presenting a seminar on the ISDOS Project on Automated System Design. Ms. CARLINE CARNES of Southern California Edison also contributed a presentation related to the use of ISDOS.

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Other guest speakers before C.& I.S. classes this past year have included Mr. DAVID DEL RIO (Software AG); Mr. TOM ROBERTSON (IBM); Mr. M.L. WILSON (IBM); Mr. FRANK KAVANAGH (Program Control Corporation); and Mr. HERBERT SCLAR (Updata).

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Speakers before Professor McLean's Spring seminar on "Information Processing in Support of Health Care Delivery" have been: Dr. ROBERT H. BROOK (UCLA School of Medicine); Mr. PAUL HUPMAN (Technicon Medical Information Systems Corporation); Mr. STUART ROSENTHAL (Meditech); Mr. WILLIAM S. RUSSELL (UCLA Hospital and Clinics); Mr. DAVID EPSTEIN and Mr. STEPHEN WOLFSON (American Medical International); Dr. MORRIS F. COLLEN (The Permanente Medicap Group); Mr. CHRIS WARNER (IBM); and Dr. DANIEL H. NINBURG and Mr. DONALD M. CARREN (Caynon General Hospital).