American Journal of Computational Linguistics *Microfiche 37*

THE FINITE STRING

NEWSLETTER OF THE ASSOCIATION FOR COMPUTATIONAL LINGUISTICS

VOLUME 13 - NUMBER 1 FEBRUARY 1976

A combined alphabetic list of members of the Association and persons mentioned in the 1974 and 1975 sets of AJCL, both contributors and authors of abstracted papers, is in preparation. A new scheme of topical categories is being prepared by cluster analysis of responses from members, and will be used as headings on a set of index guide cards which will list articles, abstracts and members by topic. The whole package will be distributed about a month after this issue.

AMERICAN JOURNAL OF COMPUTATIONAL LINGUISTICS is published by the Center for Applied Linguistics for the Association for Computational Linguistics.

EDITOR: David G. Hays, Professor of Linguistics and of Computer Science, State University of New York, Buffalo.

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ASSISTANT: David Hoffman.

PRODUCTION AND SUBSCRIPTION ADDRESS: 1611 North Kent Street, Arlington, Virginia 22209.

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BIOGRAPHICAL NOTE

STANLEY R. PETRICK

1976 PRESIDENT OF A C L

Dr. Petrick works on syntactic and semantic analysis for transformational grammars; he has been employed in this field since 1967 as a member of the Theoretical and Computational Linguistics Group at the IBM Thomas J. Watson Research Center His doctoral dissertation (Linguistics, MIT, 1965) was A *Recognition Procedure for Transformational Grammars;* it was one of the original systems to go beyond phrase structure.

Dr. Petrick programmed the Ordvac Computer in 1953 and went on to study digital computation at MIT as a student officer in the Air Force. From 1958 to 1967, the was a research mathematician in the Applied Mathematics Branch of the Air Force Cambridge Research Laboratory. His research was on truth function minimization, speech recognition, and formal language theory.

He was chairman of the ACM Special Interest Group on Symbolic and Algebraic Manipulation, 1969-1971, program chairman of the 1968 ACL meeting, and vice president of ACL in 1975.

PERSONAL NOTES

BRUDERER HERBERT To Finkenweg 3, 3110 Munsingen/Berne, from Haslerstrasse 12, Berne.

DE MEY, MARC T. M. To Department of Psychology, University of Tilburg, Hogeschoollaan 225, Tilburg, Netherlands, from Gent, Belgium.

DOBREE, NICK To Rose Cottage, Hindon, Wiltshire, England, from Beirut, pending the cessation of hostilities.

RAMEH, CLEA To School of Languages and Linguistics, Georgetown University, from a year in Brazil. Rameh is chairman of the 1976 Round Table on Languages and Linguistics.

REDDY, D. RAJ Guggenheim fellowship for studies in the computer processing of speech.

WALTER, JOHN PAUL To 1746 Curtis Avenue, Manhattan Beach, California 90266

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GEORGETOWN UNIVERSITY ROUND TABLE
ON
LANGUAGES AND LINGUISTICS 1976
"Semantics: Theory and Application"
March 11, 12, 13, 1976

The theme of the Georgetown University Round Table on Languages and Linguistics 1976 is semantics. There will be two types of meetings: (1) fourteen Interest Group Sessions on Thursday afternoon, March 11; and (2) four Plenary Sessions on Thursday evening, on Friday morning and afternoon, and on Saturday morning, March 11-13. On Friday evening, Georgetown University will host a buffet reception for those attending the Round Table.

* * *

The Interest Group Sessions will provide an opportunity for informal discussion of various related topics. These sessions will be chaired and their topics will be introduced by scholars in the various fields. A limit of 25 participants for each Group should provide a manageable interchange of ideas. Acceptance for each group will depend on early preregistration. On the form below participants should indicate their preferred Interest Group and list any specific topic they desire discussed. Those not registering until the Round Table itself cannot be guaranteed participation in an Interest Group.

The Plenary Sessions will explore the relationship of semantics to various theoretical viewpoints in linguistics, to problems in applied linguistics and to problems in language teaching. The Plenary Sessions will also discuss the relationships of semantics to anthropology, computer science, philosophy, and psychology.

Interest Group Sessions / March 11, 1976

2:30—5:30 p.m.

TOPICS AND CHAIRMEN

1 ***TEFL: English for Special Purposes***
James Alatis, Georgetown University

2 ***Communication Strategies and Modern Language Teaching***
Frederic Bosco, Georgetown University

3 ***The Semantics of Tense and Aspect in English***
Walter A. Cook, S.J., Georgetown University

4 ***Semantics, Cognition, and the Brain***
William Orr Dingwall, University of Maryland

5 ***Linguistics, Psychoanalysis, and Dynamics of Language in Groups***
Robert DiPietro, Georgetown University

6 ***Semantics and the Teaching of English to Speakers of Other Dialects***
Ralph Fasold, Georgetown University

7 ***Linguistics and Early Reading***
Robert Lado, Georgetown University

8 ***Semantics and Computer Science***
R. Ross Macdonald, Georgetown University

9 ***Literature for Basic Language Skills***
Marzieh Samii, Ferdowsi (Meshed) University

10 ***Acquiring Meaning in a Second Culture***
Muriel Saville-Troike, Georgetown University

11 ***Historical Semantics***
Shaligram Shukla, Georgetown University

12 ***Sign Language, Semantics, Semiotics***
William C. Stokoe, Gallaudet College

13 ***Bilingual Education***
F. LeRoy Walser, Office of Bilingual Education, USOE

14 ***Comprehension in Reading***
Rose Marie Weber, Cornell University

Plenary Sessions / March 11-13, 1976

HALL OF NATIONS, WALSH BUILDING, 36TH AND N STREETS, N.W.

March 11, 7:30—10:00 p.m.
Semantics: Some Synchronic and Diachronic Aspects
Dwight Bolinger, Palo Alto, California
Winfred P. Lehmann, University of Texas, Austin

March 12, 9:00—12:00 noon
Semantics and Linguistics
Jorge E. Hankamer, Harvard University
Ray S. Jackendoff, Brandeis University
Geoffrey Leech, University of Lancaster
Barbara Hall Partee, University of Massachusetts

March 12, 2:00—5:00 p.m.
Semantics and Other Disciplines
Oswald Werner, Northwestern University
Charles Rieger, University of Maryland
Gilbert Harman, Princeton University
Alfonso Caramazza, Johns Hopkins University and Concordia University

March 13, 9:00—12:00 noon
Semantics and Language Pedagogy
Frances M. Aid, Florida International University
Milton M. Azevedo, University of Colorado
Christopher N. Candlin, University of Lancaster
Ragnhild Soderberg, University of Stockholm

GEORGETOWN UNIVERSITY
SCHOOL OF LANGUAGES AND LINGUISTICS

Preregistration for the Round Table will close March 8. The preregistration fee is $6.00; the registration fee is $8.00. Early preregistration should guarantee participation in the Interest Group desired, but since participation is limited, preregistrants should indicate the order of their preference and list any specific topic they desire discussed.

Make checks payable to GEORGETOWN UNIVERSITY.

MAIL TO: Clea Rameh, *Chairman*
Georgetown University Round Table on Languages and Linguistics 1976
GEORGETOWN UNIVERSITY
WASHINGTON, D.C. 20057
Telephone: (202) 625-3021

NAME: _____
LAST (*please print or type*) FIRST MIDDLE INITIAL

ADDRESS: _____

_____
(*zip code*)

PROFESSIONAL AFFILIATION: _____

INTEREST GROUP
PREFERENCE: (1) ____, (2) ____, (3), ____ (4) ____

SUGGESTIONS FOR TOPICS OF DISCUSSION:

_____

_____

_____

_____

_____

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Science and Our Expectations: The Reach and the Grasp

Annual Meeting
Boston
18-24 February 1976

American Association for the Advancement of Science

PROGRAM EXCERPTS

EXTRATERRESTRIAL INTELLIGENCE

Extrasolar systems, origins of life, Ozma search, beacons, Soviet searches, extragalactic systems, long-range strategies.

CARL E. SAGAN, FRANK D. DRAKE, GEORGE D. GATEWOOD, LESLIE E. ORGEL, PATRICK PALMER, BEN M. ZUCKERMAN, ALAN H. BRIDLE, P. A. FELDMAN, N. S. KARDASHEV, PHILIP MORRISON

THE INTEGRATION OF THE NATURAL AND SOCIAL SCIENCES

Philosophy, humanism, normative factors

EDGAR TASCHDJIAN, ERVIN LAZLO, ALFRED KUHN

TELECOMMUNICATION, TRANSPORTATION. AND URBAN DEVELOPMENT

Substitutions for travel, urban growth, alternatives.

JACK M. NILLES, RICHARD C. HARKNESS, JERRY D. WARD, A. QUINCY JONES

MAN-COMPUTER RELATIONS: WHAT WILL THEY BE?

Automatic speech, computer programming, offices, home terminals, brain-computer hookups.

JOHN D. GOULD, WILLIAM A. WOODS, PATRICIA GOLDBERG, JERRY I. ELKIND, JOHN MCCARTHY, ADAM REED

THE PERISHING PUBLISHING PROSPECT FOR SCIENTIFIC AUTHORS

Economics and a resourceful technology are eroding the comfortable system by which post-World War II scientists have gained credit for results of their research. Existing arrangements for citation and indexing for reference and retrieval are similarly threatened. This Symposium will attempt to alert scientific authors to trends, opportunities, and dangers they must face in the next decade, as foreseen by knowledgable communicators with experties and occupational mandates to define and predict the future. Emphasis in all presentations will be on the impact of imminent changes on individual authors rather than on specialized problems in technical and scientific information transfer.

ARRANGED BY HAROLD F. OSBORNE, ASSISTANT FOR INFORMATION, DEPARTMENT OF MEDICINE AND SURGERY, VETERANS ADMINISTRATION

SCIENTIFIC JOURNALS: AN ENDANGERED SPECIES

Robert A. Day, Managing Editor, American Society for Microbiology

THE PUBLISHING OUTLOOK FOR 1985 AND BEYOND

Robert A. Harte, Executive Officer, American Society of Biological Chemists

THE CITATION OUTLOOK FOR 1985 AND BEYOND

Ben H. Weil, President, National Federation of Abstracting and Indexing Services

TRENDS IN TECHNOLOGICAL INNOVATION FOR SCIENTIFIC COMMUNICATION

Seldon W. Terrant, Head, R&D, Books and Journals Division, American Chemical Society

ELECTRONIC ALTERNATIVES TO PAPER-BASED COMMUNICATION

H. E. Bamford, Program Director for Access Improvement, Office of Science Information Service, National Science Foundation

AMERICA: THE FIRST INFORMATION SOCIETY?

Information sector, information as a commodity, location decisions, productivity, international trade, market aspects, mass production

PAUL POLISHUK, EDWIN B. PARKER, MARC U. PORAT, ANTHONY G. OETTINGER, YALE BRAUNSTEIN, HERBERT DORDICK, FRANK BERNSTEIN, VINCENT GIULIANO, LAWRENCE DARBY, ROBERT FANO

SCIENTIFIC COMMUNICATIONS AND THE ADVANCEMENT OF SCIENCE

Information is both the input of raw material and the output of scientific and engineering activities. Communications services are the means by which scientists and engineers are able to build upon the results of prior work even though that work may have been done at a distant place or in a different discipline. Many prestigious committees and study groups have analyzed the information problems of scientists and engineers and offered a broad range of recommendations for improvement. But very little has changed. This symposium will review the problems with, and needs for, communications services by the scientific community and suggest new approaches to the problem of maintaining an economically viable and user responsive scientific and technical communications enterprise in the U.S. Speakers will deal with a variety of specific questions including: What is the role of information in science and engineering? How much progress have we made in improving information services during the last 10 years? What are the current problems in financial support, organization, and management of the scientific communication enterprise? What can be done to improve the existing situation and enhance the value of scientific and technical information services to users engaged in scientific research?

ARRANGED BY RUTH M. DAVIS, DIRECTOR, INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY, NATIONAL BUREAU OF STANDARDS, AND JOEL D. GOLDHAR, PROGRAM DIRECTOR FOR USER REQUIREMENTS, OFFICE OF SCIENCE INFORMATION SERVICE, NATIONAL SCIENCE FOUNDATION

PROGRESS IN IMPROVING COMMUNICATIONS AMONG SCIENTISTS

Alvin M. Weinberg, Director, Institute for Energy Analysis

THE ECONOMIC CONDITION OF THE SCIENTIFIC COMMUNICATIONS ENTERPRISE

Fritz Machlup, Professor of Economics, New York University

THE ROLE AND IMPORTANCE OF COMMUNICATIONS IN THE ADVANCEMENT OF SCIENCE

J. Herbert Hollomon, Director, Center for Policy Alternatives, MIT

COMMUNICATING ABOUT SCIENCE TO THE PUBLIC

Edwin D. Canham, Editor Emeritus, Christian Science Monitor

NEXT STEPS--A PLAN OF ACTION FOR IMPROVING COMMUNICATIONS SERVICES IN SCIENCE AND ENGINEERING

Lewis M. Branscomb, Chief Scientist, IBM Corporation

COMPUTERS AND MEDICAL KNOWLEDGE: EXTENDING THE AVAILABILITY AND USE OF KNOWLEDGE IN MEDICINE

The symposium explores new directions of development extending the use of medical knowledge via computer-based systems. In one category of such systems, knowledge is extracted automatically from the aggregate of patient records (medical data banks); another category encapsulates and makes available decision making rules of human experts. The program describes the current state of the art in the development of these systems; reviews research in the modeling of clinical decision processes; examines the implications of computer-aided consulting on medical practice and education; and surveys Federal programs which support the training of manpower for biomedical information processing

ARRANGED BY VLADIMIR SLAMECKA, DIRECTOR, SCHOOL OF INFORMATION AND COMPUTER SCIENCE, GEORGIA INSTITUTE OF TECHNOLOGY

USE OF COMPUTERIZED DATA BASES TO AID IN PATIENT MANAGE N DECISIONS

R. A. Rosati, Assistant Professor, Duke University Medical Cente

A PERSPECTIVE ON KNOWLEDGE BASED DECISION SUPPORT SYSTEMS FOR CLINICAL MEDICINE

Harry Pople, Co-Director, Medical Information System Lab., Pitt.

METHODOLOGIES OF RESEARCH IN CLINICAL PROBLEM SOLVI

Albert N. Badre, Information and Computer Science, gia Tech.

IMPLICATIONS OF COMPUTER-AIDED MEDICAL CONSULTING

Ralph L. Engle, Jr., Medicine and Public Health, Cornell University

THE EDUCATION OF BIOMEDICAL INFORMATION/COMPUTER SCIENTISTS AND PROFESSIONALS: FEDERAL TRAINING PROGRAM

Roger W. Dahlen, Chief, Division of Biomedical Medicine, NIH

APPLICATION DEADLINES

NATIONAL ENDOWMENT FOR THE HUMANITIES

MARCH -- OCTOBER, 1976

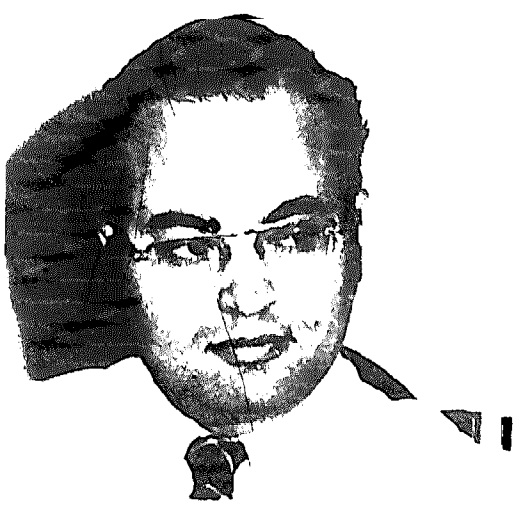
MARCH 1	FELLOWSHIPS Summer Seminars for College Teachers, 1976
MARCH 8	RESEARCH GRANTS Centers of Research, beginning after December 1, 1976
MARCH 15	EDUCATION PROGRAMS Education Project Grants, beginning after December 1
APRIL 1	EDUCATION PROGRAMS Consultants Grants (beg. 6/15); Planning Grants (12/1)
APRIL 15	YOUTHGRANTS Projects beginning after October 1, 1976
MAY 3	RESEARCH GRANTS Research Tools and Editing, beginning after Jan. 1, 1977
MAY 17	PUBLIC PROGRAMS Projects beginning after October 1, 1976
JUNE 1	FELLOWSHIPS Fellowships for Independent Study and Research, 1977-78
	RESEARCH GRANTS General Research, beginning after January 1, 1977
JULY 1	EDUCATION PROGRAMS Program Grants (1/1/77); Consultants Grants (9/15/76)
AUGUST 1	EDUCATION PROGRAMS Development Grants, beginning after May 1, 1977
AUGUST 2	PUBLIC PROGRAMS Projects beginning after January 1, 1977
OCTOBER 1	EDUCATION PROGRAMS Consultants Grants, beginning after December 15, 1976
OCTOBER 6	RESEARCH GRANTS Centers of Research, beginning after July 1, 1977

SCIENCE AND GOVERNMENT: RALSTON TO SPEAK

The scientist has prerogatives, duties, and obligations in government, and so do professional societies. Anthony Ralston, president of AFIPS and past president of ACM, will speak on this theme at a plenary session of the 1976 NCC.

Federal commissions on privacy and electronic fund-transfer systems are among the developments he cites that raise questions of professionalism, codes of ethics, good conduct, measures of proficiency, public protection, and social and political awareness.

Dr. Ralston is professor and chairman of Computer Science in the State University of New York at Buffalo.



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SECOND WORKSHOP ON COMPUTER ARCHITECTURE FOR NON-NUMERIC PROCESSING

GAINESVILLE, FLORIDA, JANUARY 22-23, 1976

SPONSORED BY ACM SIGIR, SIGMOD, SIGARCH

Stanley Y. W. Su and G. Jack Lipovski, Co-Chairmen

PROGRAM

FILE OPERATIONS IN A STREAMING PROCESSOR
B. W. Jordan, Jr., Northwestern University
K. J. King, Digital Equipment Corporation
G. D. Miller, Bell Telephone Laboratories

ARCHITECTURE OF A NONNUMERICAL ACCUMULATOR
Yaohan Chu, University of Maryland

HIERARCHICAL MICROPROCESSOR ORGANIZATION
David R. Smith, SUNY, Stony Brook

A GENERAL APPROACH TO FUNCTIONALLY DISTRIBUTED COMPUTER ARCHITECTURE
A. Reszka, Teletype Corporation
M. J. Gonzalez, Jr., Northwestern University

A STUDY OF MACHINE ARCHITECTURES FOR SPECIALIZED INFORMATION RETRIEVAL COMPUTERS
B. J. Hurley and Duncan Lawrie, University of Illinois, Urbana

A SPECIALIZED COMPUTER ARCHITECTURE FOR HIGH-SPEED TEXT SEARCHING
David C. Roberts, Central Intelligence Agency

AN ARCHITECTURE FOR THE EFFICIENT COMBINING OF LINEARLY ORDERED LISTS
Lee A. Hollaar, University of Illinois, Urbana

A MULTIPLE ASSOCIATIVE MEMORY ORGANIZATION FOR PIPELINING A DIRECTORY TO A VERY LARGE DATA BASE
P. Bruce Berra and Ashok K. Singhania, Syracuse University

A TWO-LEVEL ARCHITECTURE FOR A LARGE DATA BASE

Tomas Lang, University of California, Los Angeles
Ezatollah Nahouraii, IBM

PERFORMANCE EVALUATION OF A RELATIONAL ASSOCIATIVE PROCESSOR

E. A. Ozkarahan, S. A. Shuster, and K. C. Sevcik
University of Toronto

A VIRTUAL MEMORY SYSTEM FOR A RELATIONAL ASSOCIATIVE PROCESSOR

S. A. Schuster, E. A. Ozkarahan, and K. C. Smith
University of Toronto

IMPLEMENTATION OF A CONTEXT-ADDRESSED PIPELINE^3 SIMD ARCHITECTURE

S. J. Ackerman, A. Eman, G. J. Lipovski, and S. W. Su
University of Florida

SOFTWARE ASPECT OF THE CASSM SYSTEM

Ahmed Emam, Stanley Y. W. Su, and G. J. Lipovski
University of Florida

AMERICAN SOCIETY FOR INFORMATION SCIENCE

PRESIDENT 1976

MELVIN S. DAY

The deputy director of the National Library of Medicine was formerly head of the Office of Science Information Service, National Science Foundation.
He was chairman of the White House Committee on Scientific and Technical Information; is chairman of the Federal Library Committee s executive committee, a member of the UNISIST advisory committee, and chairman of the Panel on Environmental Quality Information of the Organization for Economic Cooperation and Development

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ANNUAL MEETING OF THE ASSOCIATION FOR

L I T E R A R Y & L I N G U I S T I C C O M P U T I N G

UNIVERSITY OF AMSTERDAM

DECEMBER 13, 1975

Computer-controlled sampling for bilanguage dictionary compilation
R. D. BATHURST, UNITED KINGDOM

Les activites du Lexique Intellectuel Europeen - traitement electronique des textes d'auteurs
T. GREGORY, ITALY

On lexicographical computing - some aspects of the work for a Mexican Spanish dictionary
L. F. LARA, MEXICO

The recognition of finite verbs in French texts
BENTE MAEGAARD, DENMARK

Address

1976 ANNUAL CONFERENCE
NATIONAL FEDERATION OF ABSTRACTING AND INDEXING SOCIETIES
CHRISTOPHER INN COLUMBUS, OHIO, MARCH 9-10

INFORMATION
Dilemmas, Decisions, Directions

TUESDAY MARCH 9, 1976

8:00 A.M. – 5:00 P.M. – REGISTRATION

THEME SESSION I: Current Research Projects Related to Abstracting and Indexing
9:00 A.M. – 11:45 A.M.
Chairman Lee G. Burchinal (NSF OSIS)
Session Note: The development of new technologies has created the potential for improvements in information systems. The NSF OSIS has taken a leading role in supporting research to contribute to increased national productivity through the use of scientific and technical information. Reports of some current basic research projects related to abstracting and indexing will be presented.

LUNCH
(Attendees to make own arrangements)

THEME SESSION II: Changing Patterns of Primary Sources 2:30 P.M. 5:00 P.M.
Chairman A. Hood Roberts (CAL)
Session Note: Not only is the quantity of primary literature requiring indexing and abstracting increasing, but also the format of the primary sources is changing. These new formats include the review journal, the synoptic journal, microforms and videotape. These new directions have a definite impact on the abstracting and indexing community.

5:00 P.M. – 6:00 P.M.
FEDERATION ASSEMBLY BUSINESS MEETING

6:00 P.M. – 9:00 P.M.
CONFERENCE-WIDE RECEPTION
at
The Center of Science and Industry
Sponsored by Chemical Abstracts Service

WEDNESDAY MARCH 10, 1976

30 A.M. 2:00 P.M. – REGISTRATION

THEME SESSION III: Indexing in Interactive Systems – 9:00 A.M. 11:45 A.M
Chairman Marvin Wilson (NTIS)
Session Note Information dissemination centers utilize both data bases created by the abstracting and indexing community and software created by the center This combination of resources creates both problems and enrichment in the transfer of information in the interactive mode. The identification of these dilemmas will promote new discussion and directions for improved dissemination of information.

MILES CONRAD MEMORIAL LECTURE
Presented by Frederick G. Kilgour (OCLC)

CONFERENCE LUNCHEON
12:30 P.M. – 2:00 P.M.

THEME SESSION IV; New Directions in User Education – 2:00 P.M. - 4:30 P.M.
Chairman Roger K. Summit (Lockheed Aircraft Corp.)
Session Note: User education involves many segments of the information community and often leads to fragmentation of the knowledge needed to utilize the resources and services available. Real needs must be identified and content provided in new modes that enable the multiple users in the information chain to maximize their understanding of materials provided.

BIBLIOGRAPHY

ISTITUTO PER GLI STUDI SEMANTICI E COGNITIVI

FONDAZIONE DALLE MOLLE

17 RUE DE CANDOLLE

1205 GENEVE, SWITZERLAND

The new address is in effect since January 1, 1976.

A list of reports was printed on Microfiche 22:46. Abstracts can be located through the index.

18. Semantics, preference, and inference. A full description of a system and a program. To appear.
19. Frames, planes, and nets. Greg Scragg. SF40 HC, SF5 MF.
20. A structure for actions. Greg Scragg. SF40 HC, SF5 MF.
21. On understanding German noun clusters. Wolfgang Samlowski SF 20 HC, SF2.50 MF.
22. A brief on case. Eugene Charniak. SF 30 HC, SF 4 MF.
23. A process to implement some word-sense disambiguations. Philip Hayes. February 1976.
24. On the referential attributive distinction. Eugene Charniak. February 1976.

25. Several ways to be suggestive. Margaret King. February 1976.

26. Pragmatic aspects of noun cluster understanding in German. SF20 HC, SF2.50 MF.

Prices of older reports in Swiss Francs:

No	HC	MF
1	5.00	
3		2.50
4		10.00
5		4.00
6.	2.50	
7.	5.00	2.50
8.	5.00	2.00
9.	5.00	2.00
10.	5.00	4.00
11.		4.00
12.	5.00	
13.	2.50	
14.	2.50	
	25.00	

American Journal of Computational Linguistics

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Petrarch Translated by Computer

SUNY Binghamton linguist finds computer a major time-saver in work on Petrarch's early letters

A work some consider to be essential to a firm grasp of Humanism and the Renaissance, the cultural movements that mark the beginning of modern times, has been translated with the assistance of the computer by *Dr. Aldo S. Bernardo* professor of Italian and comparative literature at SUNY Binghamton. The project was made possible through funding from the SUNY/Research Foundation Awards Program, and with the cooperation of Binghamton's Computer Center.

COMPUTER PRINTOUTS were a constant reference source as Dr. Aldo S. Bernardo of SUNY Binghamton dictated his translation of Petrarch s "Rerum Familiarium Libri, a collection of some 350 letters written by the famous Renaissance poet to a variety of correspondents. The work has been published by the SUNY Press.

The *Rerum Familiarium Libri* comprises about 350 Latin prose letters written by Francesco Petrarch to a number of correspondents: classical, contemporary, and some even fictitious. Dr. Bernardo's translation was recently published by State University of New York Press.

The translation began in early 1969 when the definitive edition of the Latin prose letters by Rossi and Bosco was keypunched with pagination and paragraphing into Binghamton's computer. By that summer an alphabetical word list of unique forms was ready to be translated into English.

With a team of five Latinists, Dr. Bernardo entered as many as seven meanings for each form on special printout sheets. The alphabetical listing was then converted into a chronological ordering of the forms, starting with the first word of the first letter. Using these he then translated the first eight books, or 124 letters, which this volume includes.

A concordance of the entire col lection was produced as a sort of by-product. This is to be published by SUNY Press shortly, according to Dr. Bernardo.

Dr. Bernardo believes the computer is a great time-saver in translations of this kind. Never have we had individual Renaissance Latin forms in so much context, with five or six Latin words before and after each key word. The very meter of Renaissance Latin can be studied now because of the huge context these printouts offer," he says.

A major undertaking in humanistic research the translation is the first attempt in English to make available all of Petrarch s earliest and perhaps most important collection of prose letters.

The SUNY Research Foundation Awards granted Dr. Bernardo included a $15,300 Joint Awards Council Award in 1967 (under a special program lasting for only one year) and a $3200 combination grant-in aid and fellowship awarded in 1969.

Bebe Landry
Public Information Office
SUNY Binghamton

From Chronica, Published by the Research Foundation of the State Universtiy of New York

Computer-Aided Transcription of Stenotype

Stentran Systems, Inc , located at 380 Maple Avenue, West, in Vienna, Virginia 22180, has "developed a program for the computer translation of stenotype into English," according to Michael E. LaBorde, Director of Linguistics. Experience with their system was described in two 1975 issues of the publication of the National Shorthand Reporters Association by Gilbert Frank Halasz. The Association has a Committee on Computer-Aided Transcription; their chairman is Doris O. Wong, 30 Milk Street, Boston 02109.

A news release from Stentran, dated 1975, states that their system can provide, besides the transcription, "an overview of the information arranged in conceptual fashion"

"After analysis of the semantic or legal road map which has been prepared for him," the release goes on, "the attorney is then in a position to demand additional litigation support from Stentran in the form of key words, phrases, dates, conjunctive recall of concepts or ideas, or any verbal patterns which he feels can asist him in reaching legal conclusions."

DREXEL LIBRARY QUARTERLY COVERS CURRENT ISSUES IN SERIALS LIBRARIANSHIP

PHILADELPHIA--The Drexel Library Quarterly, Volume 11, no.3, examines "Current Issues in Serials Librarianship." Serials librarians often have difficulty identifying up-to-date sources of information directly related to their work. The upcoming issue deals with these difficulties which are affecting on-the-job librarians.

The articles, selected for their timeliness, often emphasize the manner in which serials librarians can have impact upon the issues under discussion.

Benita M Weber, Serials Librarian of Montgomery County (Pa.) Community College, and Toni Carbo Bearman, Executive Director of the National Federation of Abstracting and Indexing Services, are guest editors for the issue

Articles included in the issue are: "The Serials Librarian As Activist" by David C. Taylor; "Main Entry for Serials" by Joseph J. Howard, "ISBD(S) and Title Main Entry for Serials" by C. Sumner Spalding; "International Cooperation in Serials" by Joseph W. Price; "National Serials Data Program" by Mary Sauer; "The CONSER Project" by Paul Vassallo; "CONSER Inter-Relationships" by Lawrence G. Livingston; "Serials: Costs and Budget Projections" by F.F. Clasquin; and "Education of Serials Librarians" by Benita M. Weber.

Copies of Vol. 11, no 3, "Current Issues in Serials Librarianship," are available for $4 each (outside the USA and Canada) from the Drexel Library Quarterly, Graduate School of Library Science, Drexel University, Philadelphia, Pa. 19104. Telephone: 215-895-2483.

American Journal of Computational Linguistics *Microfiche 37 : 23*

A Computer Simulation of American Sign Language

HARRY W. HOEMANN, VICKI A. FLORIAN, AND SHIRLEY A. HOEMANN

Bowling Green State University
Ohio 43403

Stokoe (1960) has designed a model of the structure of the American Sign Language (ASL) which is amenable to computer simulation. He has proposed that signs comprising the ASL lexicon are composed of three basic aspects, location (TAB), hand configuration (DEZ), and movement (SIG). He has identified a finite number of each of these elements, and he has proposed that they may be combined in various ways to constitute recognizable and meaningful signs. Recent reformulations have ventured some modifications (e.g., Stokoe, 1972), but the basic approach remains the same.

Such a conceptualization of ASL implies that if a computer were furnished a set of each of these types of elements, it ought to

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be able to compile the signs that are composed of the features in its repertoire It needs to be emphasized that such a computer simulation is not merely a matter of cartooning, although this lies within the capability of computer graphics to portray.

METHOD

APPARATUS. Our principal apparatus was an Owens-Illinois Digivue Plasma Display Unit attached to a Nova 1220 minicomputer. The Digivue Display Unit is an electronic device with a gas-filled display matrix and activating circuitry. An electrical signal is passed through each of two very fine wires at right angles to one another. When the gas is activated, it lights up at the point of intersection. There are 512 grid lines in each direction, making a total of 262,144 addressable points. Points can be written or erased at the rate of 50,000 dots per second.

The program language used was Graphic Basic, a version of Data General Corporation's time-shared BASIC, modified for use with the Digivue Display Unit (Fulton, 1974). Access to the computer was gained through the Digivue keyboard and through a teletypewriter. Paper tape output from the teletypewriter provided permanent storage of previously written programs.

PROCEDURE. As a concession to storage limitations, the project was, at first, limited to one-handed signs located on or near the face. An oval shape with stylized browline, nose, and mouth was stored in memory and served as the reference for any

sign which the computer was required to generate

Hand configurations (DEZ) were constructed by joining coordinate points with line segments. The points were stored in the memory of the computer, and graphic commands were issued to form the line segments.

As a program was fed into the computer, it stored in memory information about the DEZ and the initial TAB while the face was drawn on the screen. Another series of subroutines drew the DEZ in its initial TAB and moved it to another TAB so as to represent a movement (SIG). If the sign required a change of DEZ, the program could call the new DEZ up from memory and place it in the sign's final position.

VALIDATION. The adequacy of the simulated signs rests with their intelligibility. Deaf and hearing persons who were fluent users of ASL were tested to verify that the graphic display yielded signs that could be recognized as part of the ASL lexicon.

RESULTS AND DISCUSSION

Thus far 11 DEZ, 8 TABs, and 7 SIGs have been programmed and stored on a single paper tape. If disc storage and the necessary interface were added to our Nova, it is likely that we could represent all 12 TABs, 19 DEZ, and 24 SIGs identified by Stokoe as primes of his model. Meanwhile, the subset of structural features programmed thus far constitute a suitable feasibility

study of a computer simulation of ASL. The following results have been achieved

It has been verified that the features of ASL identified by Stokoe as structural elements may also function as distinctive features. The same DES and SIG executed with different TABs may result in signs with different meanings (*father* and *mother*, *summer* and *dry* in our data). The same TAB and SIG executed with different DEZ may also result in signs with different meanings (*who* and *lipread* in our data). Finally, the same DEZ and TAB with different SIGs may also result in signs with different meanings (*summer* and *wise*, *face* and *who* in our data).

Secondly, if any one of these aspects (TAB, DEZ, or SIG) of a sign is altered, the resulting sign compiled by the computer is likely to be "nonsense" in ASL. In our data, the 11 DEZ, 8 TABs, and 7 SIGs yield potentially 11 x 8 x 7 or 616 signs. Over 600 of them are nonsense. This indicates that most signs in ASL differ from one another in more than one distinctive feature. Also, since many signs change DEZ and involve more than one SIG, there is a low probability of confusing one sign with another, even when the signs are presented out of context.

Finally, our data indicate that the orientation of the hands also constitutes a distinctive feature in ASL. Inappropriate hand orientation can disrupt intelligibility even when the other three aspects are compiled correctly. Stokoe's model seems to

be sufficiently robust to assimilate the required revision without altering his basic approach.

This computer simulation of ASL was limited to the structural features of individual signs, and it corresponds to a study of the phonological structure of spoken languages. (Stokoe refers to his analysis as CHEROLOGY after the Greek *cheir* or *hand*.) No attempt was made in this simulation to present the signs in a linguistic context or to represent the structure of AS sentences Future studies are planned in which the graphic display of individual signs will be subject to systematic distortion to discover whether TAB or SIG aspects of signs are perceived categorically by native users of ASL.

REFERENCES

Fulton, D. L. A Plasma-Panel interactive graphic system. *Proceedings of the Society for Information Display* 15(2):74-80, 1974.

Stokoe, W. C., Jr. Sign Language structure: An outline of the visual communication system of the American deaf. *Studies in Linguistics, Occasional Papers 8.* University of Buffalo Press 1960.

Stokoe, W. C. Jr. *Semiotics and human sign languages.* Mouton, The Hague, 1972.

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P L A T O N -- A New Programming Language for Natural Language Analysis

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ABSTRACT

PLATON (Programming LAnguage for Tree OperatioN) - ne facilities of pattern matching and flexible backtracking, l. The language is developed to simplify writing analysis programs l language The pattern matching process has the facility to extract sub- from the input sentence and invoke semantic and contextual checking fu Int actions between syntactic and other components are easily obt =. If processing results in a failure, a message which expresses t: se of failure will be sent up. The control will be modified accord Thi enables us to write fairly complicated non-deterministic prog in manner. An example of structural analysis using PLATON is als ed

I Introduction

In this paper we describe a new programming language which is designed to facilitate the writing of natural language grammars. A simple structural analysis program using this language is given as an example. There are two key issues in analyzing natural language by computer: 1) how to represent knowledge (semantics, pragmatics) and the state (context) of the world, and 2) how to advance the programming technology appropriate for syntactic-semantic, syntactic-contextual interface. The point in designing a programming language is to make this kind of programming less painful.

Traditional systems which represent grammars as a set of rewriting rules usually have poor control mechanisms, and flexible interaction between the syntactic and other components is not possible. Systems in which rules of grammars are embedded in procedures, on the other hand, make it possible to intermix the syntactic and semantic analyses in an intimate way. However, these systems are apt to destroy the intelligibility and regularity of natural language grammars, because in these systems both rules and their control mechanisms are contained in the same program.

Recently various systems for natural language analysis have been developed T. Winograd's (1971) "PROGRAMMAR" is a typical example of procedure oriented systems. In this system the syntactic and other components can interact closely in the course of analyzing sentences. However, details of the program are lost in the richness of this interaction. LINGOL, developed by V. Pratt (1973) at MIT, is a language appropriate to syntax-semantics interface and in which it is easy to write grammars in the form of rewriting rules. The TAUM group at Montreal University (1971) has evolved a programming language named System-Q in which expressions of trees, strings and lists of them can be matched against partial expressions (structural patterns) containing variables and can be transformed in any arbitrary fashion.

The augmented transition network (ATN) proposed by W Woods (1970) from our point of view gives an especially good framework for natural language analysis systems. One of the most attractive features is the clear discrimination between grammatical rules and the control mechanism. This enables us to develop the model by adding various facilities to its control mechanism.

The ATN model has the following additional merits:

1. It provides power of expression equivalent to transformational grammars.

2. It maintains much of the readability of context-free grammars.

3. Rules of a grammar can be changed easily, so we can improve them through a trial-and-error process while writing the grammar.

4. It is possible to impose various types of semantic and pragmatic conditions on the branches between states. By doing this, close interactions between the syntactic and other components can be easily accomplished.

However ATN has the following shortcomings, especially when we apply it to the parsing of Japanese sentences:

1. It scans words one-by-one from the leftmost end of an input sentence, checks the applicability of a rule, and makes the transition from one state to another. This method may be well suited for English sentences, but because the order of words and phrases in Japanese sentences is relatively free, it is preferable to check the applicability of a rule by a flexible pattern-matching method. In addition, without a pattern-matching mechanism, a single rewriting rule of an ordinary grammar is often to be expressed by several rules belonging to different states in Woods ATN parser.

2. An ATN model essentially performs a kind of top-down analysis of sentences. Therefore recovery from failures in prediction is most difficult.

Considering these factors, we developed PLATON (a Programming LAnguage for Tree-OperatioN), which is based on the ATN model and has various additional capabilities such as pattern-matching, flexible backtracking, and so on. As in System-Q and LINGOL, PLATON's pattern-matching facility makes it easy to write rewriting rules. Moreover, it extracts substructures from the inputs and invokes appropriate semantic and contextual checking functions.

These may be arbitrary LISP functions defined by the user, the arguments of which are the extracted substructures.

A backtracking mechanism is also necessary for language understanding as in other fields of artificial intelligence. During the analysis, various sorts of heuristic information should be utilizable. At any stage, analysis based on criteria which may relate to syntactic, semantic or contextual considerations taken separately may be unreliable. The result which fulfils all the criteria, however, will be a correct one. The program should be designed such that it can choose the most satisfactory rule from many candidates according to the criteria at hand. In further processing, if the choice is found to be wrong by other criteria, the program must be able to backtrack to the point at which the relevant decision was made. In PLATON we can easily set up arbitrary numbers of decision points in the program. Then, if subsequent processing results in some failure, control will come back to the points relevant to the cause of the failure.

II. Pattern-matching

Before proceeding to the detailed description of PLATON, we will explain the representation schema for input sentences and parsed trees. The process of analyzing a sentence, roughly speaking, may be regarded as the process of transforming an ordered list of words to a tree structure, which shows explicitly the interrelationships of each word in the input sentence. During the process, trees which correspond to the parts already analyzed, and lists which have not been processed yet, may coexist together in a single structure. We therefore wish to represent such a coexisting structure of trees and lists. A list structure is a structure in which the order of element is not changeable. On the other hand, a tree structure consists of a single

root node and several nodes which are tied to the root node by distinguishable relations. Because relations between the root and the other nodes are explicitly specified, the order of nodes in a tree is changeable except for the root node which is placed in the leftmost position. Different matching schemas will be applied to trees and lists.

The formal definition of such coexisting structures is as follows. <structure> is the fundamental data-structure into which all data processed by PLATON must be transformed. Hereafter we refer to this as the "structure" The formal definition of <structure> is:

<structure> ::= <tree> | <list>

<list> ::= (* <structures>)

<structures> ::= |<structure> < structures >

<tree> ::= < node> | (<node> < branches>)

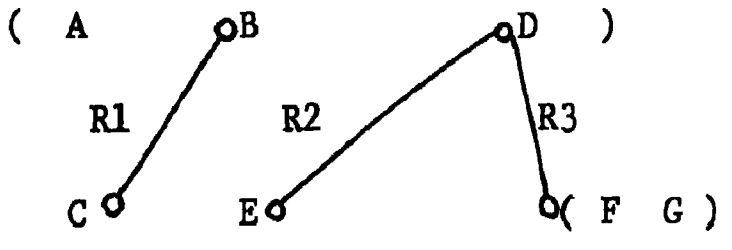
<branches> ::= <branch> | < branch> < branches >

<branch> ::= (< relation> <tree>)

< node> ::= <list> | ARBITRARY LISP-ATOM

< relation > ::= ARBITRARY LISP-ATOM

A simple example is shown in Figure 1.



Coexisting Structure of Trees and Lists

(* A (B ,(R1 C)) (D (R2 E)
(R3 (* F G))))

Corresponding Expression in PLATON

Figure 1 Expression of Structure in PLATON

Two lists which have the same elements but different orderings (for example, (* A B C) and (* A C B)), should be regarded as different structures. On the other hand, two tree structures such as (A (R1 B) (R2 C)) and (A (R2 C)(R1 B)) are regarded as identical. Besides the usual rewrite rules which treat such strings, structural patterns which contain variable expressions are permitted in PLATON. The PLATON-interpreter matches structural patterns containing variable expressions against the structure under process and checks whether the specified pattern is found in it. At the same time, the variables in the pattern are bound to the corresponding substructures.

Variables in patterns are indicated as :X (X is an arbitrary LISP atom). The following can be expressed by variables in the above definition of <structure> .

(1) arbitrary numbers of <structures> , that is to say, list elements in the definition of <list> (Figure 2, Ex. 1). We can also specify the

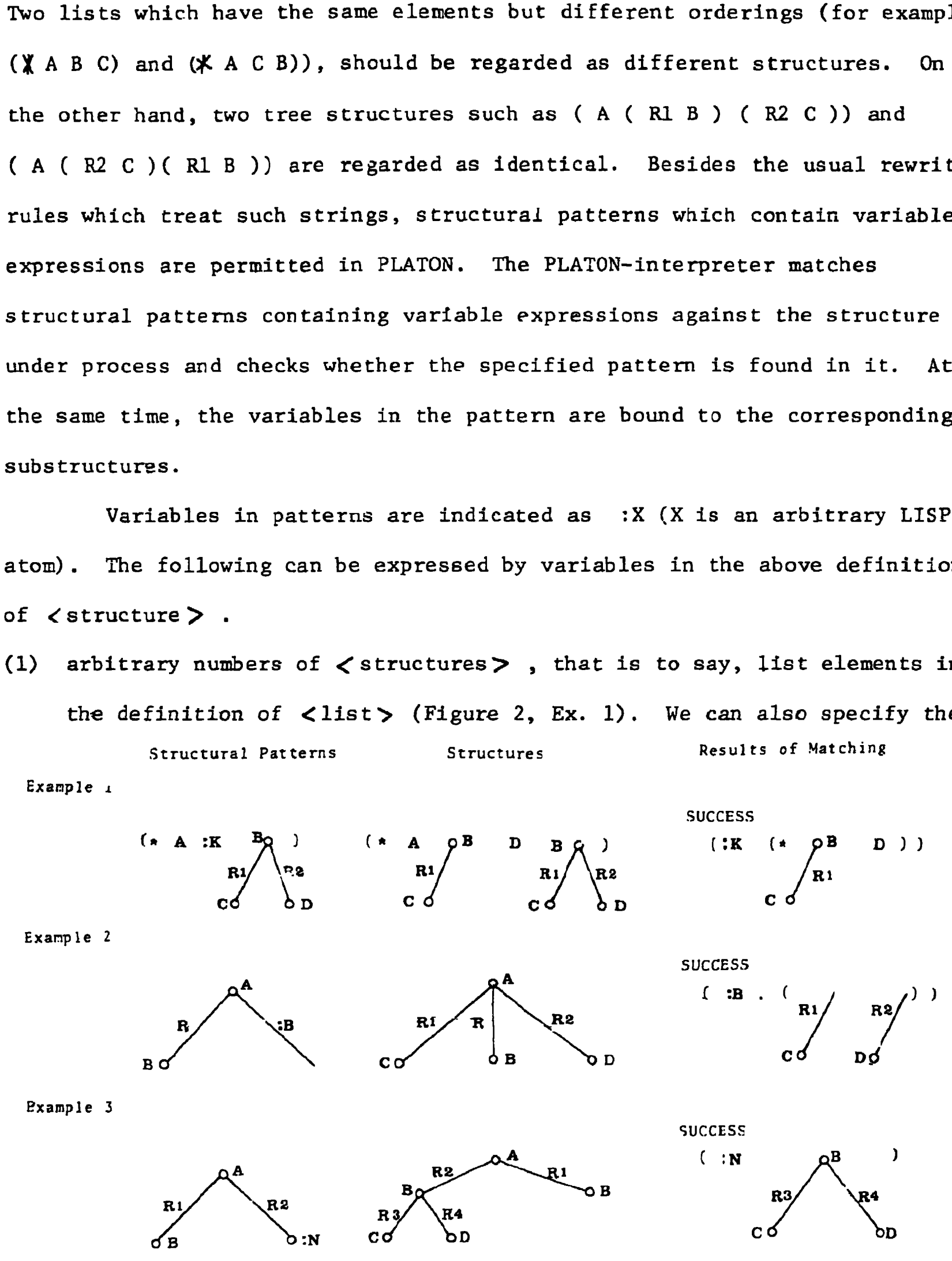


Figure 2 Illustration of Matching

number of list elements by indicating variables as :X+number. For example, the variable :D2 will match with two elements in a list.

(2) arbitrary numbers of <branches> , in the definition of <tree> (Figure 2, Ex. 2).

(3) <tree> in the definition of <branch> (Figure 2, Ex. 3).

We shall call such structural patterns <structure-1 > . By using the same variable several times in a pattern, we can express a structure in which the same sub-structure appears in two or more different places. The character '!' in a list indicates that the next element following the character is optional.

III Basic Operations of PLATON

A grammar, whether generative or analytical, is represented as a directed graph with labeled states and branches. There is one state distinguished as the Start State and a set of states called Final States. Each branch is a rewriting rule and has the following elements:

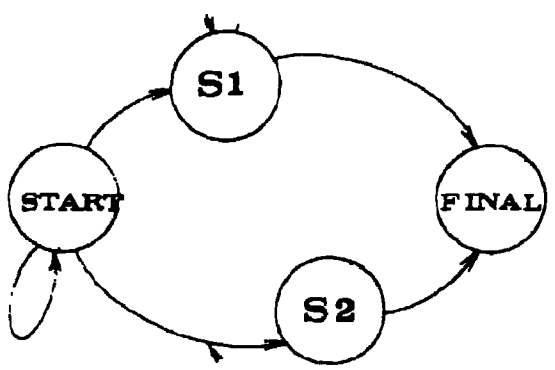
(1) applicability conditions of the rule, typically represented as a structural pattern

(2) actions which must be executed, if the rule is applicable

(3) a structural pattern into which the input structure should be transformed.

Each state has several branches ordered according to the preference of the rules. When the control jumps to a state, it checks the rules associated with the state one-by-one until it finds an applicable rule. If such a rule is found, the input structure is transformed into another structure specified by the rule and the control makes the state transition.

In addition to the above basic mechanism the system is provided with push-down and pop-up operations. The push-down operation is such that in the process of applying a rule, several substructures are extracted from the whole structure by variable binding mechanisms of pattern-matching. Then each is analyzed from a different state. The pop-up operation is such that after each substructure is analyzed appropriately, control comes back to the suspended rule and execution continues. Using these operations, embedded structures can be handled easily (See Figure 3).



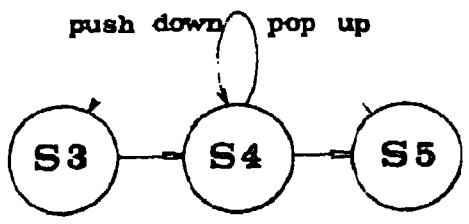


Figure 3 State Diagram

Table 1 shows the formal definition of a grammar of PLATON (See following page). It shows that branches or rewriting rules in an ATN parser correspond to six-tuples (i.e., <pcon> , <strx> , <con> , (<trans>), (<acts>), <end>). <strx> corresponds to the left side of a rewriting rule and describes the structural pattern to which a rule is applicable. <strx> is, by definition

(1) / or

(2) structure-1

TABLE 1 Formal Definition of Grammar in PLATON

```
<grammar>  :: = ( <states> )

<states>   :: = <state> | <state> <states>

<state>    :: = ( <state-name>  <rules> )

<rules>    :: = |<rule> <rules>

<rule>     :: = ( <pcon> <strx> <con> ( <trans> )( <acts> ) <end> )

<trans>    :: = | <transit><trans>

<transit>  :: = (( <state-name> <structure-2> { <register-name> | <variable-name> }) <errorps>

<errorps>  :: = | <errorp> <errorps>

<errorp>   :: = ( <failure-message> <act> <pros> )

<pros>     :: = <pro> | <pro> <pros>

<pro>      :: = (EXEC <trans> ) |(TRANS ( <state-name> <stry> ))

<end>      :: = (NEXT <state-name> <stry> )
                |(NEXTB <state-name> <stry> )
                |(POP <stry> ) | (FM <failure-message> )

<acts>     :: = | <act><acts>

<act>      :: = <form> | (SR <register-name> <form> )
                | (SU <register-name> <form> )
                |(SD <register-name> <form> )

<strx>     :: = <structure-1> | /

<stry>     :: = <structure-2> | /

<pcon>,<con>:: = <form>

<form>     :: = (GR <register-name> ) | (GV <variable- name> )
              |(TR <structure-2> ) |(TR /) | ARBITRARY LISP FORM

<variable- :: = :X (X is an arbitrary LISP atom)
 name>

<register- :: = /X (X is an arbitrary LISP atom)
 name>
```

shows that a rule is applicable no matter what the structure under process is The variables used in < structure-1 > are bound to corresponding substructures when matching succeeds. The results of Example 1 (See Figure 2) indicate that the variable :K is bound to the substructure (* (B (R1 C)) D)

The scope of variable binding is limited to within the realm of the particular rule. The same variable name in different rules has different interpretations. In this sense, :X-type variables in <structure-1> are called Local Variables. On the other hand, we can store certain kinds of results from the application of rules in registers and refer back to them in different rules. These constitue variables which we call registers. They are represented by the symbols /X (X is an arbitrary LISP atom).

Besides the pattern-matching, <pcon> and <con> can also check the applicability of a rule. Certain parts of the results from the application of previous rules are contained in registers, not in the structure. We can check the contents of these registers by using <pcon>-part functions like GR, GU, etc. (these functions are listed in Table 2) and other LISP functions defined by the usual LISP function, DEFINE. (See following page for Table 2.)

Semantic and contextual co-ordination between substructures can be checked by using appropriate functions in the <con>-part of a rule. Semantic and contextual analyses cannot be expressed in the form of simple rewriting rules. These analyses have differing requirements such as lexical information about words which may in turn represent knowledge of the world and contextual information which may express the state of the world. We can use arbitrary LISP-forms in the <con>-part, according to what semantic and contextual models we choose.

TABLE 2 Functions of PLATON

Function	Argument	Effect	Value
SR	<register-name> LISP - <form>	SR stores the result of the evaluation of the 2nd argument in the register.	the result of the evaluation of the 2nd argument
SV	<variable-name> LISP - <form>	SV stores the result of the evaluation of the 2nd argument in the variable	the result of the evaluation of the 2nd argument
GR	<register-name>	GR get the content of the register	the content of the register
GV	<variable-name>	GV gets the value of the variable	the value of the variable
TR	<structure-2> or /	TR transforms the variables and registers in the structural pattern into their values.	the transformed structure
SU	<register-name> LISP - <form>	SU sets the reigster of the higher level processing	the result of the evaluation of the 2nd argument
SD	<register-name> LISP - <form>	SD sets the register of the lower level processing.	the result of the evaluation of the 2nd argument
GU	<register-name>	GU gets the content of the register of the higher level.	the content of the register
PUSHR	<register-name> LISP - <form>	PUSHR is defined as the following. (SR <register-name> (CONS <form> (GR <register-name>)))	the result of the evaluation of the 2nd argument

For example, suppose

strx = (ADJ (TOK :N))(N(TOK :N1)) :I)

con = (SEM :N :N1)

Here TOK is the link between a word and its part of speech. :N and :N1 are the words of an input sentence. SEM is a function defined by the user which checks the semantic co-ordination between the adjective :N and the noun :N1. By this function SEM, we can search, if necessary, through both lexical entries and the contextual data bases.

With this approach, if a certain syntactic pattern is found in the input structure, it is possible for an appropriate semantic function to be called. Hence the intimate interactions between syntactic and semantic components can be obtained easily without destroying the clarity of natural language grammars.

Arbitrary LISP-forms can be also used in < act > -portion. They will be evaluated when the rule is applied. If necessary, we can set intermediate results into registers and variables by using the functions listed in Table 2

< end > comprises four varieties, and rules are divided into four types according to their < end > types.

1. NEXT-type: The < end > is in the form (NEXT <state-name> <stry>). The <stry> corresponds to the right side of a rewriting rule, and represents the transformed structure. A rule of this type causes state-transition to the <state-name> , when it is applied.
2. NEXTB-type: This rule also causes state-transition. Unlike with the NEXT-type, state-saving is done and if further processing results in some failures, control comes back to the state where this rule is applied. The environments, that is, the contents of various registers will be restored, and the next rule belonging to this state will be tried

3. POP-type: The <end> -part of this type is in the form (POP <stry>) When it is applied, the processing of this level is ended and the control returns to the higher level with the value <stry> .
4. FM-type: The <end >-part of this type is in the form (FM <failure-message >). The side effects of the processing at this level, that is, register settings and so on, are cancelled (see section 4).

In <stry > we can use two kinds of variables, that is, the variables used in <strx > and registers. We find this structural pattern, called <structure-2 > , more suitable for writing transformational rules than Woods BUILDQ-operation. By way of illustration consider the following:

input string	= (* C D E (A (R1 (* B))) F G)
strx	= (* :I (A (R1 :N)) :J)
stry	= (* (A (R1 (* :I :N))(R2 /REG)) :J)
the content of /REG	= (G (R3 H))

As the result of matching, the variables :I, :N and :J are bound to the substructures (* C D E), (* B) and (* F G) respectively. The result of evaluating the < stry > is

(* (A (R1 (* C D E B))(R2 (G (R3 H)))) F G).

If the rule is a POP-type one, then this structure will be returned to the higher level processing. If it is NEXT- or NEXTB-type, then the control will move to the specified state with this structure.

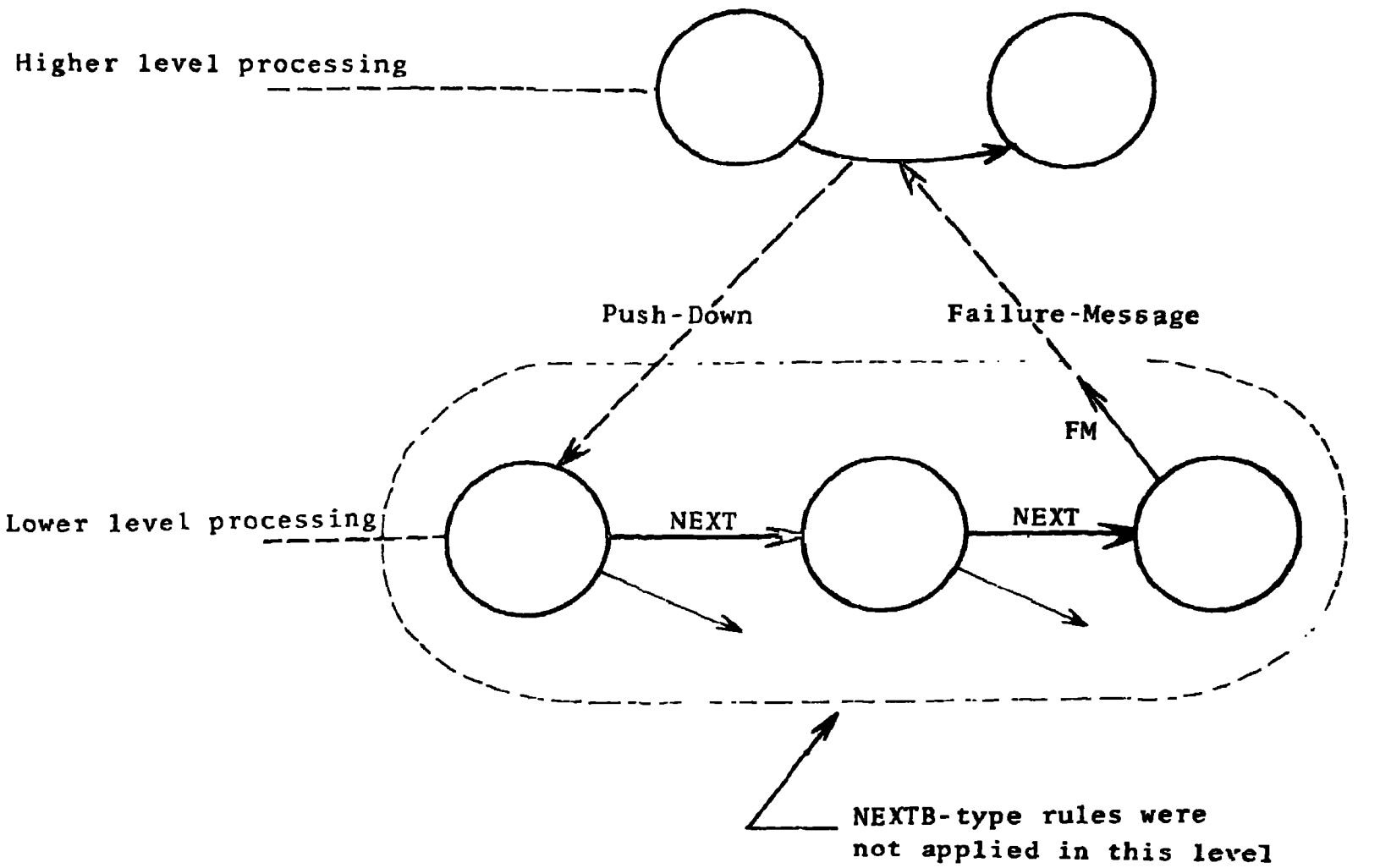
IV Push-down and Pop-up Operations

By means of NEXTB-type rules, we can set up decision points in a program. We can also do this by using push-down and pop-up operations. A rule in PLATON finds particular syntactic clues by its structural description

< strx > ; and at the same time, extracts substructures from the input string From the structural description it is predicted that the substructures may have particular constructions, that is, they may comprise noun phrases, relative clauses or whatever. It is necessary to transfer the substructures to states appropriate for analyzing these constructions predicted and to return the analyzed structures back into the appropriate places In PLATON, these operations can be described in the < trans > -part of a rule. For example, suppose the < trans > -part of a rule is

(((S1 :K :K)) ((S2 (* :I :J)/REG)))

When the control interprets this statement, the substructures corresponding to the variable :K and (* :I :J) are transferred to the states S1 and S2 respectively If the processings starting from these states are normally completed (by a POP-type rule), then the results are stored in the variable :K and the register /REG. In this manner, by means of the push-down and pop-up mechanisms, substructures can be analyzed from appropriate states. Processing from these states, however, may sometimes result in failure. That is, predictions that certain relationships will be found among the elements of substructures may not be fulfilled. In such instances the pushed down state will send an error-message appropriate to the cause of the failure by an FM-type rule. An FM-type rule points out that a certain error has occurred in the processing. If NEXTB-type rules were used in the previous processing at this level, control will go back to the most recently used NEXTB-type rule. If NEXTB-type rules were not used at this processing level, the error-message specified by the FM-type rule will be sent to the < trans > part of the rule which directed this push-down operation (see Figure 4)



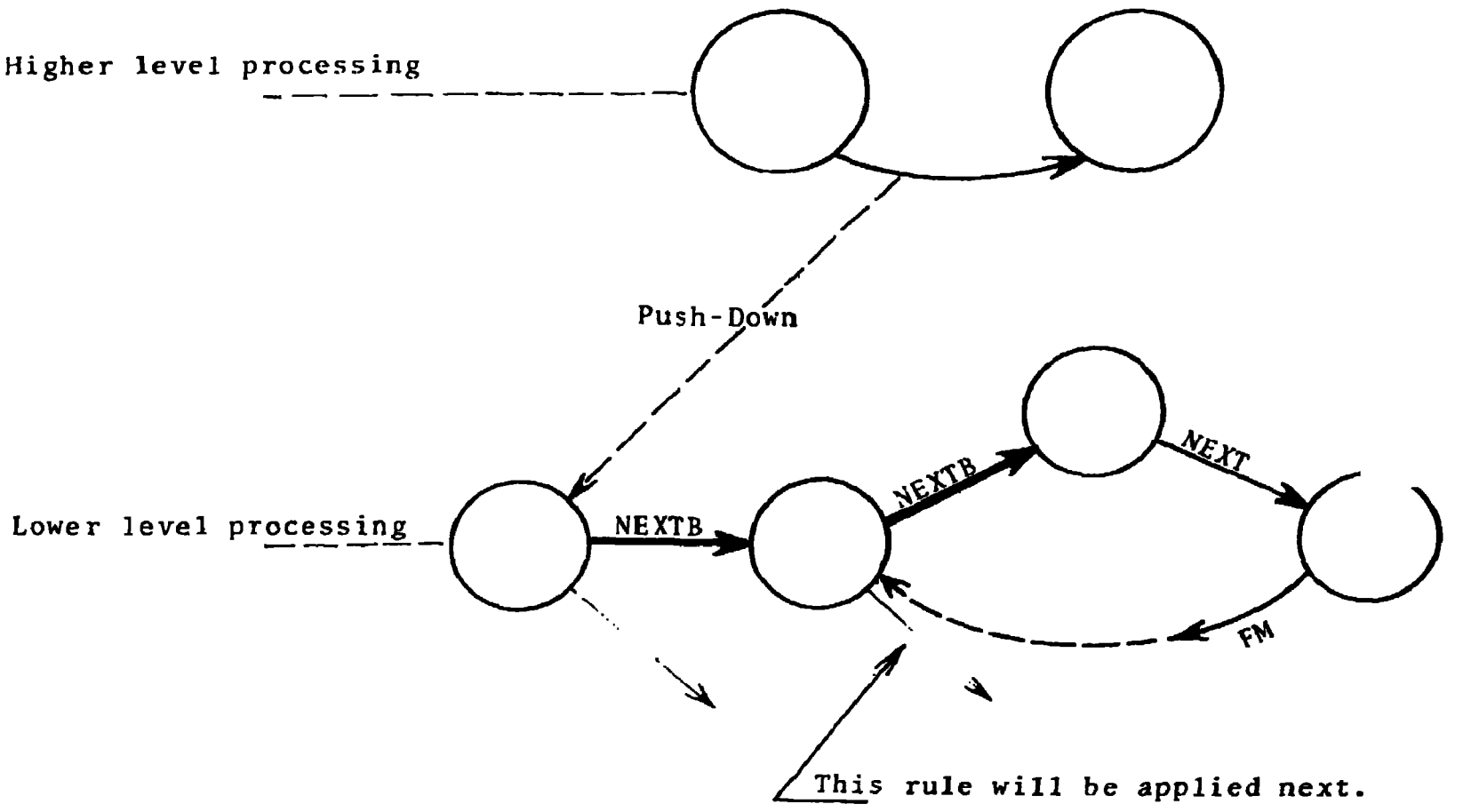


Figure 4 Illustration of Backtracking

According to these error-messages, control-flow can be changed appropriately. For example, we can direct processings by describing the < trans > -part in the following way.

```
( (( S1 :K :K )( ERR1 ( EXEC (( S5 :K :K )) (( S6 (* :I :J ) /REG ))))
                    ( ERR2 (TRANS ( S8 /)))
    ((S2 (* :I :J )  /REG ))  )
```

In the above example, the processing of the substructure :K from the state S1 will produce one of the following three results. According to the returned value, the appropriate step will be taken:

(1) Normal return: the processing of :K is ended by a POP-type rule. The result is stored in the variable :K and the next push-down performed, that is (* :I :J) will be transferred to the state S2.

(2) Return with an error-message: the processing of :K results in a failure and an FM-type rule sends up an error-message. If the message is ERR1, then :K and (* :I :J) will be analyzed from the states S5 and S6 respectively (EXEC-type). If it is ERR2, the interpreter will give up the application of the present rule, and pass the control to another state S8 (TRANS-type). If it is neither ERR1 nor ERR2, the same step as (3) will be taken

(3) Return with the value NIL: the processing from the state S1 will send up the value NIL if it runs into a blind alley, that is, there are no applicable rules. The interpreter will give up the application of the present rule and proceed to the next rule attached to this state.

Mechanisms, such that control flow can be appropriately changed according to the error-messages from lower level processings are not found in Woods ATN parser. We can obtain flexible backtracking facilities by combining these mechanisms with NEXTB-type rules.

V A Simple Example

We are now developing a deductive question-answering system with natural language inputs -- Japanese sentences. The internal data-base is assumed to be a set of deep case structures of input sentences. We adopted and modified Fillmore's (1968) case grammar to analyze the input of Japanese sentences. Japanese is a typical example of an SOV-language in which the object and other constituents governed by a verb usually appear before the verb in a sentence. A typical construction of a Japanese sentence is shown in Figure 5.

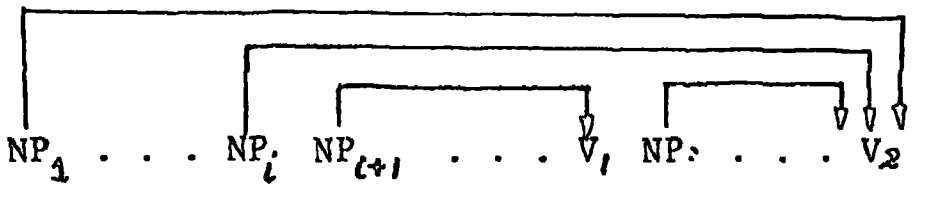


Figure 5 Typical Construction of a Japanese Sentence

A verb may govern several noun phrases preceding it. A relative clause modifying a noun may appear in the form -- verb + noun -- The right boundary of the clause is easily identified by finding the verb. The left boundary is often much more difficult to identify. In Figure 5, the noun phrase NP_{i+1} is a case element of the verb V On the other hand, the noun phrase NP_i is governed by the verb V_2 Because the rule of projections holds in Japanese as in other languages, all the noun phrases between NP_{i+1} and V are governed by V , and the noun phrases before NP_i are governed by V_2 However, in the course of analysis, such boundaries cannot be determined uniquely. The analysis program fixes a temporary boundary and proceeds to the next step in processing If the temporary boundary is not correct, the succeeding processing will fail and the control wil come back to the point

at which the temporary boundary was fixed.

Now we will show a simple example of structural analysis by PLATON The example explains how the backtracking facility is used in analyzing Japanese sentences. Because we want to visualize the operations of PLATON without bothering with microscopic details of Japanese sentences, we will take an imaginary problem as an example. The parser which is written in PLATON is described in another paper by M Nagao and J. Tsujii (1976)

An input string is assumed to be a list. The elements of the list are integers and trees are in the form of (X (SUM 0)). Here 'X' may be regarded as a term modified by 'SUM 0' These two kinds of elements are arranged in an arbitrary order, except that the last element is the tree (X(SUM 0)). The following is an example of an input string:

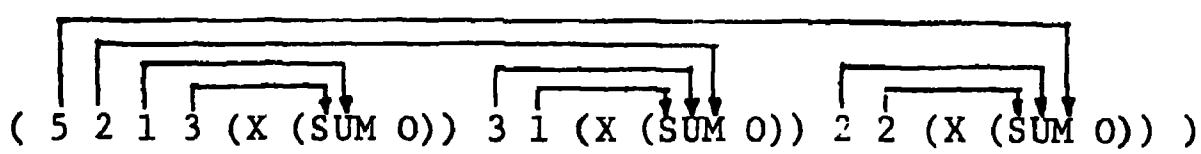
(5 2 1 3 (X (SUM 0)) 3 1 (X (SUM 0)) 2 2 (X (SUM 0)))

Figure 6 An Example String to be Analyzed

The result of the transformation is expected to be in the following form:

((X (SUM 4)) (X SUM 6)) (X (SUM 9)))

This result is regarded as representing the following relationships between integers and 'X'.



The number associated with an 'X' by the relation 'SUM' shows the sum of the integers which are governed by the 'X'. We can look upon the relations between integers and an 'X' as the relations between noun phrases and the verb in Japanese sentences. The result of the analysis is assumed to satisfy the following conditions.

(1) Governor-governed relationships between integers and an 'X' must obey the projection rule (i.e., clauses do not overlap).

(2) As a simulation of a semantic restriction, we attach a condition that the sum of the integers governed by an 'X' should not exceed ten.

(3) As a simulation of a contextual restriction, we attach the condition that a result (* (X (SUM num-1)) (X (SUM num-2)) . . . . (X (SUM num-N))) should maintain the relation, num-1 $\leqq$ num-2 $\leqq$ . . . . $\leqq$ num-N.

A set of rules is shown in the following. The corresponding state-diagram is shown in Figure 7.

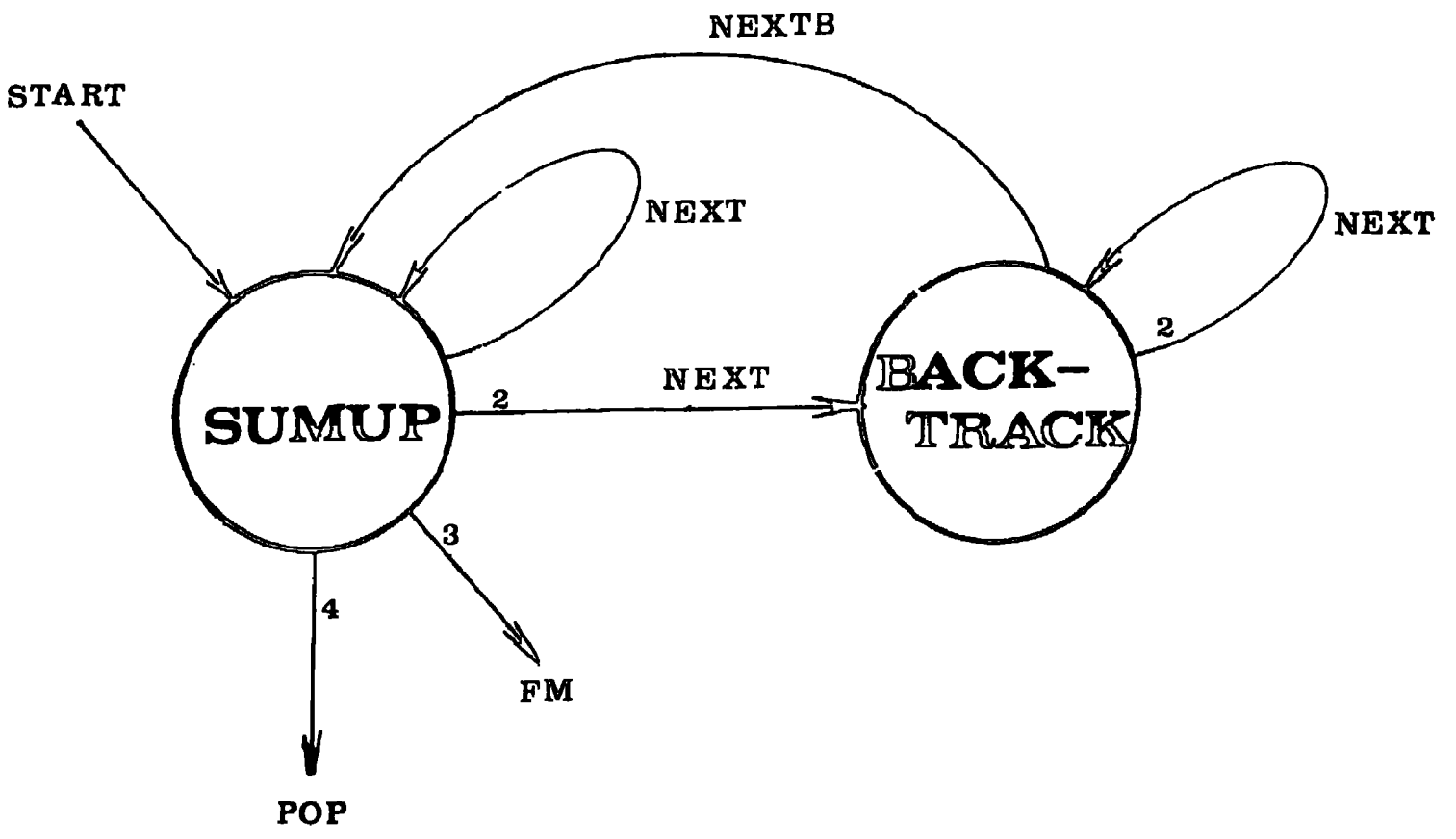


Figure 7 State Diagram of a Simple Example

```
SUMUP -1-  strx: = (*  :I :I1 (X (SUM :N)) :J)
           con:  = ( GREATERP 10 (PLUS :N :I1))
           act: = ( (SV :N (PLUS :N :I1 ))
                    (PUSHR  /REG :I1) )
           end: = (NEXT SUMUP (*  :I (X (SUM :N)) :J) )
      -2-  strx : = (*  :I (X (SUM :N)) :J)
           con: = (CONTEXTCHECK /RESULT (TR (X (SUM :N))))
           act: = NIL
           end: = (NEXT BACKTRACK /)
      -3-  strx: = (*  :I (X (SUM :N)) :J)
           con: = T
           act: = NIL
           end: = (FM-ERROR)
      -4-  strx: = (* )
           con: = T
           act: = ( (SR /RESULT (CONS 'X /RESULT )) )
           end: = (POP /RESULT)
BACKTRACK
      -1-  strx: = (*  :I (X (SUM :N)) :J)
           con: = T
           act: = ( (SR /REG NIL)
                    (SR /RESULT (APPEND /RESULT ( TR (X (SUM :N))))) )
           end: = (NEXTB SUMUP (*  :I :J ))
      -2-  strx: = (*  :I (X (SUM :N)) :J)
           con: = T
           act: = ( (POPR /TEMP /REG)
                    (SV :N (MINUS :N /TEMP)) )
           end: = (NEXT BACKTRACK (*  :I /TEMP (X (SUM :N)) :J) )
```

The input string is the list shown in Figure 6. Since the start state is SUMUP, the first rule attached to this state is applied. This rule will find the leftmost 'X' and an integer just before the 'X' (by SUMUP -1-, strx). The variable :I1 is bound to this integer. This integer is added to the sum of the integers, :N, if the total does not exceed ten (SUMUP -1-, con). PUSHR, used in the < act > -part, is a PLATON function which puts the second argument on the head of the first argument (SUMUP -1-, act) After this rule is applied, the control will enter the state SUMUP again (SUMUP -1-, end). That is, this rule is applied until there are no integers before the first 'X' or the sum of the integers exceeds ten. As the result, the environment is the following:

structure under processing

= (* 5 (X (SUM 6)) 3 1 (X (SUM 0)) 2 2 (X (SUM 0)))

relationship temporarily fixed between integers and 'X'

= (5 2 1 3 X 3 1 X 2 2 X)

content of /REG

= (2 1 3)

The second rule of SUMUP will be applied next. This rule checks by its < con> part whether the result at hand satisfies the third condition, that is, the contextual restriction. Because the content of /RESULT is NIL, the function CONTEXTCHECK returns the value T (SUMUP -2-, con). So this rule is applicable. Control makes the state-transition to the state BACKTRACK (SUMUP -2-, end) Because the first rule of BACKTRACK is a NEXTB-type rule, state-saving is performed. That is, the following environment is saved:

content of /REG = (2 1 3)

content of /RESULT = NIL

structure under processing =

(* 5 (X (SUM 6)) 3 1 (X (SUM 0)) 2 2 (X (SUM 0)))

By this rules, the registers /REG and /RESULT are set as follows (BACKTRACK -1-, act).

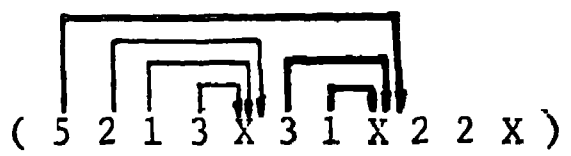
/REG : = NIL

/RESULT: = ((X (SUM 6)))

And the structure is transformed to

(✱ 5 3 1 (X (SUM 0)) 2 2 (X (SUM 0)))

A NEXTB-type rule causes a state transition as does a NEXT-type rule. So control returns to the state SUMUP (BACKTRACK -1-, end). At this state, a process similar to the one described above is performed. As a result, the following governor-dependent relationships are established.



Here the bold lines indicate the newly established relationships. By the first rule of BACKTRACK the following environment is saved.

content of /REG = (5 3 1)

content of /RESULT = ((X (SUM 6)))

structure under processing = (✱ (X (SUM 9)) 2 2 (X (SUM 0)))

And /REG and /RESULT are set as the following (BACKTRACK -1-, act).

/REG: = NIL

/RESULT: = ((X (SUM 6)) (X (SUM 9)))

The transformed structure is (BACKTRACK -1-, end)

(✱ 2 2 (X (SUM 0)))

The control is transferred to the state SUMUP. By applying the first rule of this state repeatedly on the above structure the following structure is obtained.

(✱ (X SUM 4)))

However this result does not satisfy the contextual restriction. So the application of the second rule of SUMUP fails because the function CONTEXTCHECK used in <con> -part returns the value NIL (SUMUP -2-, con) That is:

contextcheck [((X (SUM 6))(X (SUM 9))) : (X (SUM 4))] = NIL

The third rule, therefore, will be applied next. Because this rule is a FM-type rule (SUMUP -3-, end), it causes an error and control comes back to the point at which a NEXTB-type rule was applied most recently. The saved nvironment is restored. This is:

/REG: = (5 3 1)

/RESULT: = ((X (SUM 6)))

structure under processing: = (* (X (SUM 9)) 2 2 (X (SUM 0)))

Then by applying the second rule of BACKTRACK, the governor-governed relationship established lastly in the previous process is cancelled. The structure and the register /REG are changed as below (BACKTRACK -2-, act):

/REG: = (3 1)

structure under processing: (* 5 (X (SUM 4)) 2 2 (X (SUM 0)))

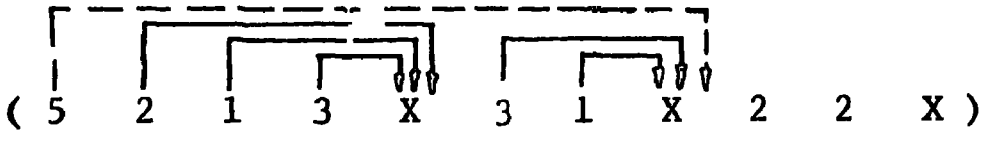
Control enters the BACKTRACK state again. The application of the first rule saves the environment:

content of /REG = (3 1)

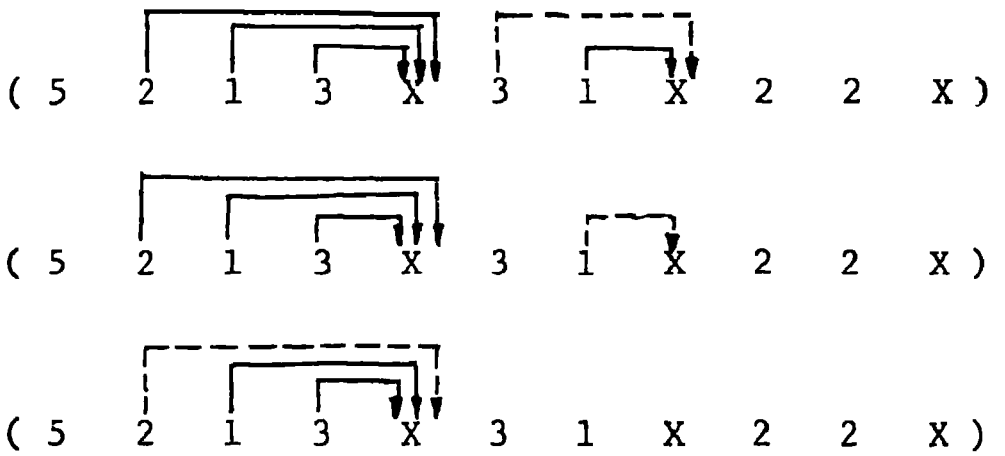
content of /RESULT = ((X (SUM 6))

structure under processing = (* 5 (X (SUM 4)) 2 2 (X (SUM 0)))

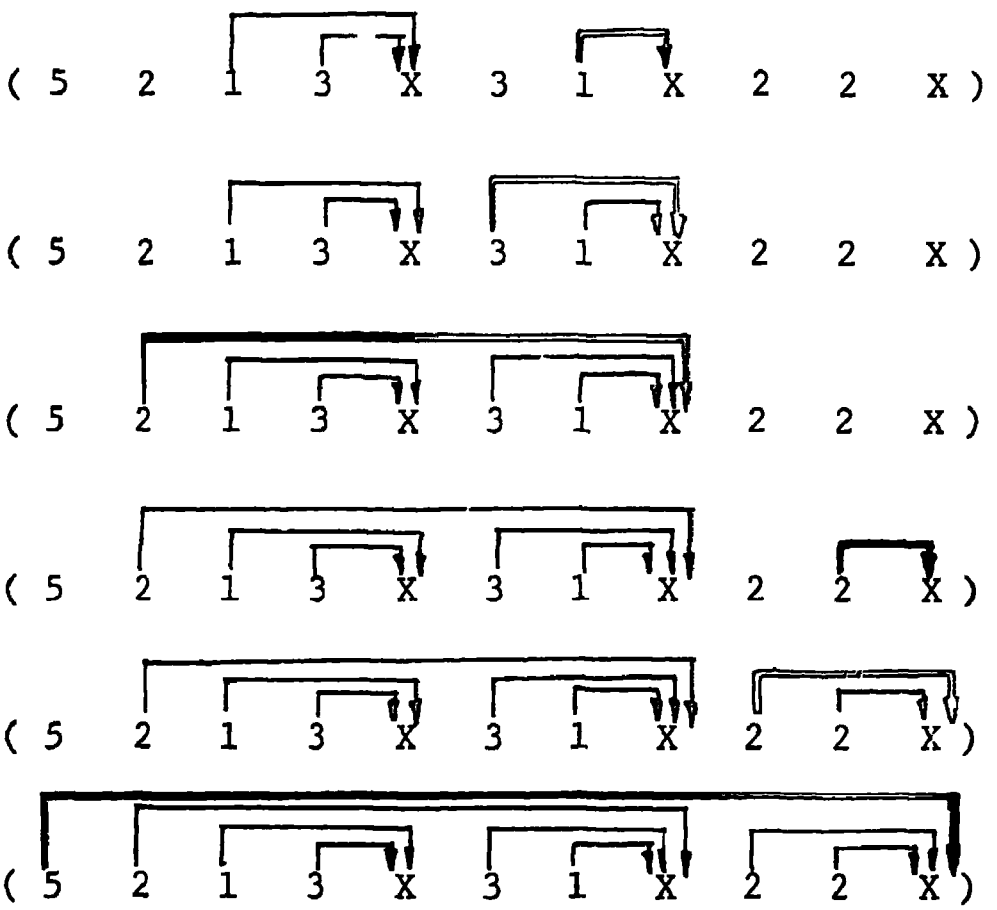
That is, the relationship indicated by the dotted line in the following is cancelled:



Control transits to the state SUMUP (BACKTRACK -1-, end) and a similar process is performed. However, because the governor-governed relationship between the integer 5 and the second 'X' is cancelled, the sum of the integers governed by the first 'X', (2 1 3), is greater than that of the second 'X', (3 1). The contextual condition, therefore, is not fulfilled, and the application of the second rule of SUMUP will not succeed. So the temporarily established relationships will be cancelled one-by-one as follows.



After these relationships have been cancelled, the desired result is obtained by the following sequence.



At the final stage of the processing, the fourth rule of SUMUP a POP-type rule, is applied and returns the value

(* (X (SUM 4)) (X (SUM 6)) (X (SUM 9)))

VI Conclusion

We have described a programming language called PLATON for natural language processing. The language has several additional capabilities beyond the ATN parser of W. Woods.

Grammars written in the language not only maintain clarity of representation but also provide adequately a natural interface between the syntactic component and other components. By means of the pattern-matching facility, we can write grammars in a quite natural manner. And because of the PLATON variable binding mechanism, semantic and contextual LISP functions a easily incorporated in syntactic patterns.

Flexible backtracking mechanisms and push-down operations make complicated non-deterministic processing possible in a very simple way.

We are now developing an analysis program for Japanese using this language. The program can accept fairly complicated sentences in a textbook of elementary chemistry It can utilize the lexical and contextual information of chemistry adequately during the analysis. Such information in our system is expressed in the form of a semantic network similar to that of R. F. Simmons (1973).

Perhaps, PLATON itself must be equipped with more semantics and context-oriented operations such as specified lexical descriptions and functions using them. However, what description method is most efficient, and moreover, what semantic information must be stored in the lexicon, are not yet entirely clear. So, as the first step, PLATON leaves many parts of these problems for

the user to specify by LISP programs. PLATON is written in LISP1.5 and implemented on a FACOM 230-60 at the Kyoto University computing center and a TOSBAC-40 mini-computer in our laboratory. The interpreter of PLATON itself requires only 4.5 K cells.

BIBLIOGRAPHY

D. Bobrow, B. Fraser. "An augmented state transition network analysis procedure", Proc. 1st IJCAI, pp. 557-568, (1969).

A. Colmerauer. "Les systemes-q ou un formalisme pour analyser et synthetiser des phrases sur ordinateur", Project de Traduction automatique de l'Universite de Montreal, TAUM 71, Jan., (1971).

C. J. Fillmore. "The case for case", in Bach and Harms (eds.), Universals in Linguistic Theory, Holt, Rinehart & Winston, pp. 1-90, (1968).

C. Hewitt. "PLANNER: A language for manipulating models and proving theorems in a Robot", in Artificial Intelligence, Washington, D. C , May, (1969)

M. Nagao, J. Tsujii. "Mechanism of deduction in a question answering system with natural language input", Proc. 3rd IJCAI, pp. 285-290, (1973).

M. Nagao, J. Tsujii. "Programming language for natural language processing - PLATON", J.IPSJ, Vol. 15, pp. 654-661, (1974).

M. Nagao, J. Tsujii. "Analysis of Japanese Sentences by Using Semantic and Contextual Information". (forthcoming in AJCL-1976)

V. Pratt. "A linguistic oriented programming language", Proc. 3rd IJCAI, pp. 372-381, (1973).

J. Rulifson, et. al. "QA4-A language for writing problem-solving programs", SRI Technical Note 48, November, (1970).

J. Thorpe, P. Bratley, H. Dewar. "The syntactic analysis of English by machine". In Michie (ed.), Machine Intelligence 3, New York, American Elsevier, (1968).

T. Winograd. "Procedures as a representation for data in a computer program for understanding natural language", MIT Thesis, (1971).

W. Woods. "Augmented transition network grammars for natural language analysis", CACM, Vol. 13, pp. 591-602, (1970).

MEMBERSHIP STATEMENT

INDIVIDUAL MEMBERSHIPS IN A C L
BY STATUS AT THE END OF 1975

Members paid through 1976	5
Members paid through 1975	571
Members paid through 1974	121
Exchange and gift subscriptions	47

EDITOR'S REPORT

During 1975, this Journal published 20 contributions through the ordinary channels of review; it also published two microfiches of abstracts from the Varna conference and five microfiches of proceedings of the 1975 Annual Meeting of the Association for Computational Linguistics. A directory of members also appeared.

Early in 1975, the Journal announced an experimental procedure for review of submissions; the author could submit a 600-word summary for distribution to all members of the Editorial Board. Of the last 30 submissions, 15 have used this procedure. Contributors and Board members appear satisfied with the results.

The number of microfiches distributed in the 1975 subscription was 22, up from the 14 distributed to 1974 members. But the number of frames increased from 900 to 1700, roughly; as anticipated, the average number of frames filled is going up

Since the first announcement of the Journal, 86 submissions have been received. Their present status is shown at the top of the following frame.

31 have been published

18 are with the author for minor revision

15 are with the author for major revision

16 have been rejected

3 are in process

2 have been returned as unsuitable or withdrawn

At the end of March, 1975, 10 manuscripts were out for minor revision; 4 of them have been published. Of the 7 then out for major re sion, two have been published. We might thus expect to publish as many as 7 or 8 of the manuscripts now out for revision, making a total of about 36 of 81 received; our ultimate acceptance rate may be around 45%.

The financial support of the National Science Foundation, which continued through 1975, and the unpaid help of both the State University of New York and the Xerox Palo Alto Research Center (the latter is processing bibliographies and indexes) have been most significant in establishing the new Journal. The work of the Editorial Board, editorial aides, and the staff of the Center for Applied Linguistics are also important.

American Journal of Computational Linguistics *Microf.*

SURVEY OF MEMBERS

PRELIMINARY REPORT

The last mailing of the 1975 subscription included a questionnaire about the level and direction of members interests, their use of the Journal, and their preferences among three forms of publication: microfiche, paper, and mixed.

By the end of January, 200 replies had arrived and the rate of arrival had diminished * The present report makes no interpretations or explanations; the figures are here for the Editorial Board, the Executive Committee, and the members to examine. All written comments received in response to the questionnaire are presented following the numerical data.

Members who have strong opinions about the policy the Association should adopt may write to any officer of the Journal or Association; but prompt action is needed in order to permit planning and development of manuscripts for the 1977 volume.

* The issue left the editor on November 7; the questionnaire was to be returned "by December 31!" Due to unforeseen delays, the issue reached readers beginning immediately after Christmas in the Washington area, and late in January in Hawaii and abroad.

RESPONSES TO SINGLE QUESTIONS

1 How many AJCL microfiches have you read?

None	30
One	20
2 to 5	61
6 or more	88
No response	1

2. How can you read a microfiche?

Own a microfiche reader	50
Go to a convenient place	80
Go to an inconvenient place	64
No means available	6

3. How many AJCL opaque cards have you examined carefully or read through?

None	6
1 to 5	18
6 to 10	40
11 or more	135
No response	1

4. How significant is the material in AJCL to you?

Highly significant; I need much of the content of AJCL in my work	32
Fairly significant; I sometimes need information of the kind I have seen published in AJCL	131
Hardly significant; I rarely need anything from AJCL	32
Not significant; nothing I have seen in AJCL would be useful to me	2
No response	3

5. What do you want ACL to supply to you?

Original papers	181	
Survey papers	161	CHECK AS MANY
Bibliography	151	AS APPROPRIATE
News	149	

6. Judging from your own opinion and what you know of your colleagues, does AJCL probably lose contributions to other journals because they are printed and AJCL is on microfiches?

Yes, AJCL's format loses contributions	75
No, AJCL's format probably does not lose contributions	82
No response	43

7. Is a microfiche printer available to you if you want full-size copy?

Yes	86
No	106
No response	8

8. If AJCL offered paper copies of the articles on microfiche, sent by mail at $2 per article (up to 97 pages), how many would you have bought in 1975?

None	88
One	21
2 or 3	64
4 or more	21
No response	6

9. Which of the following plans do you want AJCL to carry out?

Microfiche publication; about 2000 manuscript pages per year	116
Paper publication; about 500 manuscript pages per year without an increase in dues	24
Mixed publication; about 250 manuscript pages per year printed on paper, supplemented by about 1000 manuscript pages on microfiches	44
No response	16

10. If AJCL continues to publish on microfiches, but offers a subscription on paper at a high price as an alternative, would you pay $20 to $30 extra for yourself?

Yes	13
No	181
No response	6

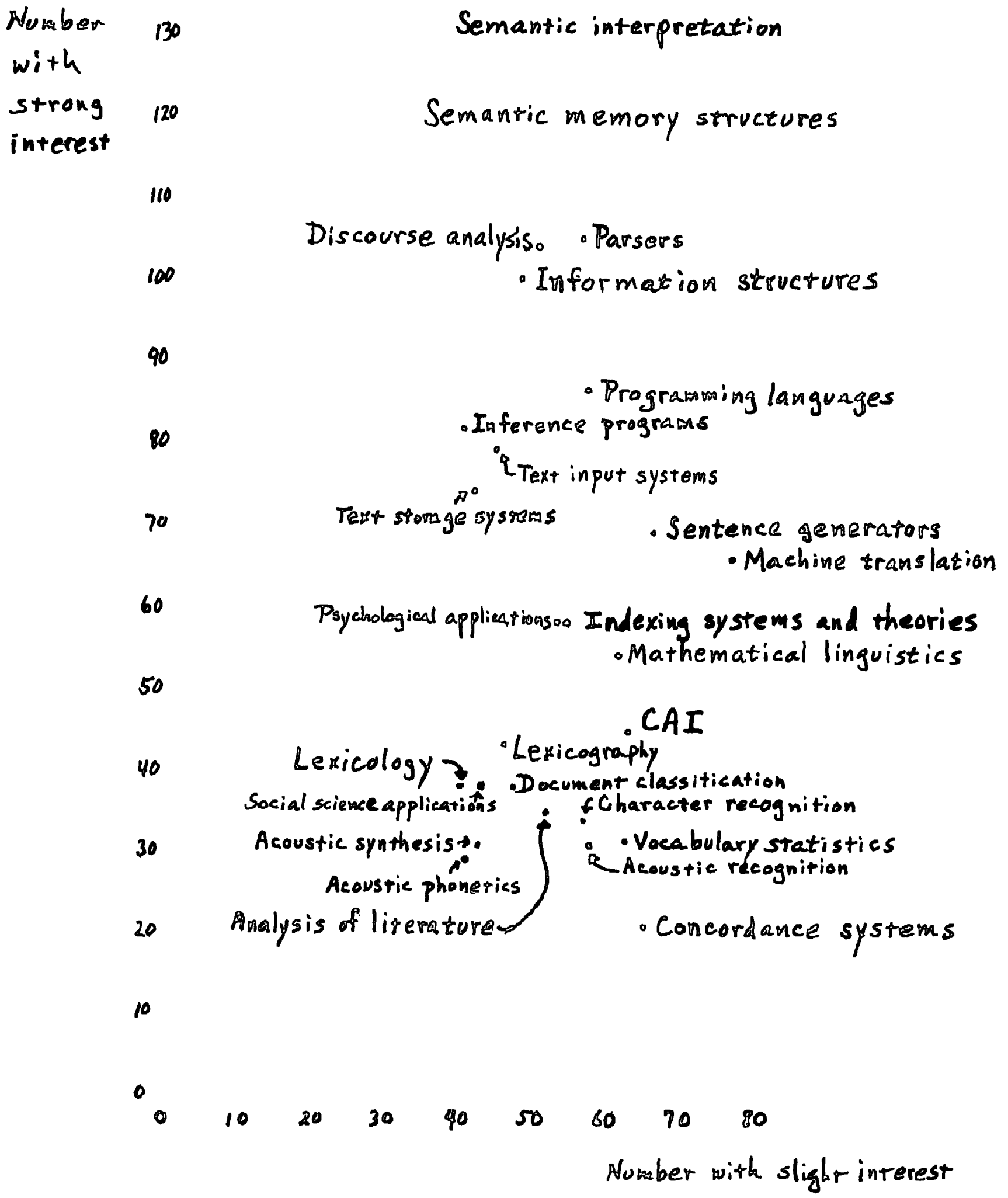
11. If AJCL continues to publish on microfiches, what do you expect to do?

Resign from the Association	10
Pay dues without reading the Journal	18
Buy (or borrow) a reader	33
Continue a satisfactory arrangement for reading fiches	133
No response	6

12. Indicate your range of interests by checking as many boxes as appropriate. Leave blank the topics that do not interest you. (The purpose of this question is guidance for the Editorial Board.)

The answers are tabulated on the next frame and displayed in a graph on the next following frame. Thereafter the cross-tabulation of groups of questions begins.

Topical category	Level of interest	
	Strong	Slight
Acoustic phonetics	29	40
Acoustic recognition	31	57
Acoustic synthesis	31	42
Character recognition	34	56
Text input systems	79	43
Text storage systems	74	40
Parsers	105	54
Sentence generators	69	64
Semantic interpretation	131	33
Discourse analysis	104	48
Semantic memory structures	120	30
Mathematical linguistics	54	60
Lexicography	43	45
Lexicology	38	39
Concordance systems	21	64
Vocabulary statistics	32	62
Inference programs	82	38
Programming languages	87	55
Information structures	100	46
Indexing systems and theories	58	53
Document classification	38	46
Machine translation	66	75
Psychological applications	58	52
Social science applications	38	42
Analysis of literature	35	51
Instructional systems (CAI)	45	62


Number with strong interest
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Semantic interpretation
Semantic memory structures
Discourse analysis.
• Parsers
• Information structures
• Programming languages
• Inference programs
• Text input systems
• Sentence generators
• Machine translation
Text storage systems
Psychological applications
Indexing systems and theories
• Mathematical linguistics
• CAI
• Lexicography
Lexicology
• Document classification
Social science applications
• Character recognition
Acoustic synthesis
• Vocabulary statistics
Acoustic recognition
Acoustic phonetics
Analysis of literature
• Concordance systems
0 10 20 30 40 50 60 70 80
Number with slight interest

RESPONSES BY LEVEL OF SIGNIFICANCE OF AJCL

In these tables, each cell reports the number of members (out of 200) who give specified answers to question 4 (How significant is the material in AJCL to you?) and another question, jointly. In the first table, the number of members who find AJCL fairly significant and have read 6 or more microfiches is 48.

1. How many microfiches have you read?

Significance	Number of microfiches read				
	0	1	2-5	6+	NA
High	2	4	5	20	1
Fair	19	10	43	59	
Low*	9	6	13	9	

*Includes Hardly or Not significant and no response.

2. How can you read a microfiche?

Significance	Method of reading microfiches			
	Own reader	Convenient place	Inconvenient place	No means
High	5	14	12	1
Fair	35	56	37	3
Low	10	10	15	2

3. How many AJCL opaque cards have you examined or read?

Significance	Number of cards read				
	0	1-5	6-10	11+	NA
High		2	4	25	1
Fair	5	6	29	91	
Low	1	10	7	19	

5. What do you want AJCL to supply to you?

Significance	Original papers	Survey papers	Bibliography	News
High	31	29	27	30
Fair	120	103	102	97
Low	30	29	22	22

6. Does AJCL probably lose contributions?

Significance	Does lose	Does not lose	No response
High	17	12	3
Fair	44	58	29
Low	14	12	11

7. Is a microfiche printer available to you?

Significance	Printer available		
	Yes	No	NA
High	13	16	3
Fair	57	71	3
Low	16	19	2

8. How many articles would you buy from AJCL at $2?

Significance	Number of articles				
	0	1	2-3	4+	NA
High	13	2	10	6	1
Fair	57	13	46	11	4
Low	18	6	8	4	1

9. Which plan do you want AJCL to carry out?

Significance	Microfiche	Paper	Mixed	No response
High	19	1	8	4
Fair	77	14	30	10
Low	20	9	6	2

10. If AJCL publishes microfiches, would you pay $20 for paper?

Significance	Yes	No	NA
High	2	29	1
Fair	8	119	4
Low	3	33	1

11. If AJCL continues on microfiches, what will you do?

Significance	Resign	Pay dues, not read	Buy a reader	Continue as now	NA
High		1	8	21	2
Fair	5	12	19	91	4
Low	5	5	6	21	

RESPONSES BY CONVENIENCE OF READING MICROFICHES

In these tables, each cell reports the number of members (out of 200) who give specified answers to question 2 (How can you read a microfiche?) and another question.

1 How many microfiches have you read?

Convenience	Number of microfiches read				
	0	1	2-5	6+	NA
High*	5	8	46	70	1
Low**	25	12	15	18	

* Own a reader or go to a convenient place

**Go to an inconvenient place or have no means

3. How many AJCL opaque cards have you examined or read?

Convenience	Number of cards read				
	0	1-5	6-10	11+	NA
High	3	13	26	87	1
Low	3	5	14	48	

4. How significant is AJCL? (See table above.)

5. What do you want AJCL to supply to you?

Convenience	Original papers	Survey papers	Bibliogrpahy	News
High	118	105	97	94
Low	63	56	54	55

6. Does AJCL probably lose contributions?

Convenience	Does lose	Does not lose	No response
High	32	73	25
Low	43	9	18

7. Is a microfiche printer available to you?

Convenience	Printer available		
	Yes	No	NA
High	65	59	6
Low	21	47	2

8. How many articles would you buy from AJCL at $2?

Convenience	Number of articles				
	0	1	2-3	4+	NA
High	69	16	36	8	1
Low	19	5	28	13	5

9. Which plan do you want AJCL to carry out?

Convenience	Microfiche	Paper	Mixed	No response
High	93	6	24	7
Low	23	18	20	9

10. If AJCL publishes microfiches, would you pay $20 for paper?

Convenience	Yes	No	NA
High	3	125	2
Low	10	56	6

11. If AJCL continues on microfiches, what will you do?

Convenience	Resign	Pay dues not read	Buy a reader	Continue as now	NA
High	1	5	11	112	1
Low	9	13	22	21	5

RESPONSES BY CONVENIENCE AND SIGNIFICANCE

In the following tables, each cell reports the percentage of members who indicate a given degree of significance for the material in AJCL, a given degree of convenience in reading microfiches, and a specified answer to a third question. For example, 91 of 200 members find the material fairly significant and have a convenient means of reading microfiches. Of those 91, 48 have read 6 or more microfiches; 48 constitutes 53% of 91, so the entry in the indicated cell is 53.

1. Percentage who have read 6+ microfiches

Significance	Convenience	
	High	Low
High	74	46
Fair	53	27
Low	40	6

3. Percentage who have read 11+ cards

Significance	Convenience	
	High	Low
High	84	69
Fair	67	75
Low	50	53

5. Percentage who want AJCL to publish original articles

Significance	Convenience	
	High	Low
High	95	100
Fair	91	92
Low	85	76

Percentage who want AJCL to publish survey articles

Significance	Convenience	
	High	Low
High	84	100
Fair	81	72
Low	75	82

Percentage who want AJCL to publish bibliography

Significance	Convenience	
	High	Low
High	79	92
Fair	78	77
Low	55	65

Percentage who want AJCL to publish news

Significance	Convenience	
	High	Low
High	95	92
Fair	71	80
Low	55	65

6. Percentage who think AJCL loses contributions

All respondents

Significance	Convenience	
	High	Low
High	32	84
Fair	25	52
Low	15	65

Excluding no response

Significance	Convenience	
	High	Low
High	35	92
Fair	33	78
Low	23	85

7. Percentage who have a printer available

Significance	Convenience	
	High	Low
High	47	30
Fair	48	32
Low	60	24

8. Estimate of number of printed papers that would be purchased, per member in the category; assuming 2.5 papers if the answer is 2 or 3, and 5 papers if the answer is 4 or more.

Significance	Convenience	
	High	Low
High	1.2	2.4
Fair	1.3	1.7
Low	0.5	2.2

9. Percentage who prefer each publication policy

Significance	Convenience					
	High			Low		
	Micro	Paper	Mixed	Micro	Paper	Mixed
High	63	5	21	54		31
Fair	71	4	20	30	25	30
Low	80	5	10	24	47	24

The percentages for the three policies should add to 100 in each category of convenience and significance, but the percentage who did not answer is not shown.

10. Percentage who would pay $20 to $30 extra for paper

Significance	Convenience	
	High	Low
High	5	8
Fair	2	15
Low	0	18

11. Percentage who intend to take each action if AJCL continues to publish microfiches

Convenience	Significance	Resign	Not read	Buy a reader	Continue as now
High	High	0	0	11	89
	Fair	0	5	9	85
	Low	5	0	5	90
Low	High	0	8	46	31
	Fair	12	17	27	35
	Low	24	29	29	18

Each row of the table should sum to 100%, but some did not respond to question 11.

LONG COMMENTS

Here's my survey questionnaire. Anent the decision as to where to go from here, I have a very strong recommendation to make. I think you're in a pioneering position on something very important, and should stick with it, certainly for at least two or three more years if at all possible. The major difficulty and source of objections, I think, is not any of the arguments against microfiche that you outline, but simply the difficulty people have in adopting radically new habits in such a fundamental activity as reading.

Which brings me to the second point. I think that as a pioneer, the Editorial Board of the AJCL has a responsibility to try to make the experiment succeed, and not just sit back and watch. Specifically, I think it's very important to make available to subscribers a microfiche reader which works reasonably well, is not terribly expensive, and most importantly, is easy to acquire. I would bet that if you arranged with a manufacturer or dealer to supply a small, practical reader in the $25-$35 price range, which people could order simply by writing their name and address on an addressed, postage-paid return card included in an AJCL packet, at least a hundred would be sold within a month You would have done your readers a service, and would also have broadened the base of those who are in a position to make use of the microfiche format.

There are a variety of details to be considered in implementing such a plan, for instance, that the supplier should be prepared to make exchanges for defective units, but I'm sure that the members of the Editorial Board are as alert to these as I am. I would appreciate hearing what reaction people have to this suggestion.

Paul G. Chapin
National Science Foundation
Washington, D.C. 20550

I am quite pleased at receiving the AJCL on microfiche and would hope that other organizations to which I belong would at least offer optional microfiche subscriptions to their journals. I find myself inundated with printed publications and am running out of space to store these valuable documents; I do not want my office or my home turned into a library.

When I receive a copy of the AJCL, I read through the opaque cards looking for paper summaries that interest me. When I find such a paper, I use the department's microfiche reader to browse through it. Occasionally I have the library make a paper copy for me so that I can study papers without access to a microfiche viewer.

One service which I think might be useful for AJCL subscribers without such convenient access to hard-copy microfiche machines would be an opaque card which one could use to order paper copies of selected articles.

James R. Rhyne
Department of Computer Science
University of Houston, Texas 77004

The microfiche journal is the best thing ACL has got going for it. In the last couple of years, I've been letting my memberships in a number of organizations lapse. One of the principal reasons is that I simply can't cope with the flood of paper which results from memberships. My house and office get cluttered up with stacks of magazines that can't be chucked because one article in a dozen looks as if it ought to be read some time. It's gotten to the point where new issues go straight from the mailbox to the recyclery. For this "service", one pays extra.

Microfiche solves that; I've got two years' worth of ACL output in a 6" x 6½" metal box, and there's room for two more years. If I ever run out of room for metal boxes, I can cull out selected cards.

By all means, make your "experiment" permanent!

Anonymous

More notes on your questionnaire!

(1) I have been getting IEEE Computer, IEEE Computer Transactions, and IEEE Spectrum since 1969 on microfiche. I no longer have paper copies of these earlier issues. I bought a cheap microfiche reader in 1969.

(2) I bought a Realist (Xerox 320) 1½ years ago.

(3) I also get now AJCL Journal (yours), Scientific American (Bell & Howell), IEEE Software Engineering regularly on microfiche.

(4) I buy selected titles from NTIS and University Microfilms (Micromedia--kids books). I subscribe to NTIS computer weekly abstracts @$30/yr. No company reimbursement.

(5) After a years research I have produced my first amateur microfiche at home which dops on a Bruning. (So I now will be a publisher!)

(6) I am a microfilm/microfiche COM expert in Management Systems at work (only part time). I am a systems analyst on data center management software.

(7) Being an engineer and an analyst AJCL is currently a peripheral area of interest. I would not have joined your organization if your journal was only on paper. I got into microfilming because I was running out of space.

(8) I believe I will be able to keep a tremendously large number of journals, magazines, professional or pleasure reading books if they are on microfiche. By keeping good inventories in a safety deposit box I will have good insurance and replacement in case of fire.

(9) Able to microfilm (fiche) myself I will be able to archive (and back up against fire) any book or paper I work on. It would be easier to correspond and exchange papers with someone around the world or U.S. Lower postage.

(10) I would like to see all hard bound and paper back books, all magazines available on microfiche. The savings for the Library of Congress and copyright office would be tremendous. These fiche should also be available to individuals from the publishers.

(11) I also get the ACM Communications, and ACM Surveys on fiche

I trust I will see the results of your survey, and maybe my letter, in the next AJCL Newsletter.

Neil R. Karl
21425 Duns Scotus
Southfield, Michigan 48075

Your recent questionnaire on the AJCL format invited additional comment I may be biased but I think micropublication of our journal is a superb answer to the twin problems of skyrocketing publication/distribution costs and the need to disseminate more information to students of this growing field.

No serious student or scholar should be without a microfiche reader. Good compact readers from $100 (the Bell & Howell Brief Case reader) to $214 (the Washington Scientific Industries Mini-Cat) are available. Surely a modest investment for a life-time of use.

I do think, however, that you can more effectively package the microfiche for increased user convenience. There are two basic approaches: 1) Bind fiche envelopes and the eye-legible cards together before they are distributed to subscribers or 2) provide subscribers with a convenient microfiche binder file.

Thomas F. Deahl, Microdoc
815 Carpenter Lane, Philadelphia 19119

It is my opinion that far from being a disadvantage, microfiche is a positive advantage. Already a large amount of my home and office space is devoted to storing technical journals which I have saved over the years, and as time passes the problem will only get worse. I only hope that you will continue to distribute AJCL on fiche, and that other journals will follow your example.

I do, however, find the small size of the opaque cards to be inconvenient. Perhaps you could combine all the opaque cards in each issue into one or two 8½x11" sheets, which could be folded when mailed, then spread open and collected in a looseleaf or other book when received.

Norman Haas
35-20 Leverich Street
Jackson Heights, N.Y. 11372

While having the freedom to publish very detailed accounts of large programs is useful I think that a more space conscious medium would encourage more concise descriptions. The freedom to be verbose does not strike me as a good idea in this field!

Also, it is difficult to judge the effect of the microfiche format on soliciting manuscripts because the journal is new and thus has no developed prestige.

Unsigned

Although I do not object to microfiche format, I find the organization of opaque cards and fiche sometimes confusing and easily disordered.

Unsigned

I'd like to see ACL offer--at a good price--a fiche reader. My intuitive requirements are 1) "book-page" size image, 2) stowable, 3) transportable, 4) under $100. Comment?

Peter Z. Ingerman
40 Needlepoint Lane
Willingboro, N.J. 08046

I believe the best alternative would be to 1) continue journal on microfiche, 2) arrange to sell inexpensive readers to subscribers through ACL (or widely publicize where and for how much readers are available) 3) offer hard copy versions of articles by individual order.

Unsigned

I am a computer programmer by profession and my interest in linguistics extends only to those areas which are directly applicable to computers. Even there my interest is more concerned with the practical side rather than with esoteric theory. Since most of what you print can only be considered as future referent material by me, your printing of the journal on microfiche is eminently satisfying to me; in fact, if you switched entirely to paper, I would have to seriously consider my continued receiving of the journal.

Robert D. Kluto
2179 Pacific Avenue
San Francisco, California 94115

SHORT COMMENTS

General

Fiche is good for scanning and storing info where only occasional reference is needed. Paper copy needed for the few papers of frequently needed reference.

It didn't even reach me until Jan. 5, probably due to a poorly registered address label. (I bet a lot don't make it if they're all as bad as mine.)

I am a student and could not afford AJCL publications in printed form.

You might make the microfiche envelope larger (to contain the opaque copy) and use face of envelope to print information on it

You should have asked how long I was a member to interpret this stuff.

Sorry this is late One of my major reasons for subscribing to AJCL is that it is published in microfiche.

For $10 a year I am very satisfied. You might consider negative contrast to ease the eye strain

I haven't found time to read articles but expect to and like the format.

Love fiche.

At this moment I'm not working directly in the field of CL.

PLEASE NOTE: Negative, rather than positive, microfiche provides the clearest and easiest to read copy. An option for negative fiche copy would encourage a great deal of new memberships.

1) Do offer printed copies. 2) Currency is far more important than "prestige" (whose?)

Only major complaint about fiche is that all the readers are lousy on the eyes.

I prefer to be forced to get used to microfiche because paper should not be wasted.

Despite the current inconvenience for me of microfiche publication, I am in favor of continued publication on the grounds that maybe it'll spread and eventually encourage better reader technology.

A lot of good work is being done by people who are not too famous; it's very important that it should be published inexpensively somewhere.

Question 1.

Answer 1: But unrelated to microfiche as medium.
Answer 0: Because "go to inconvenient place".
Plan to buy a viewer as soon as I can afford one.
Answer 6: Parts only.

Question 2.

Answer own a reader: Have 2.
Department.
Recently.
Very recently.
Costs about as much as a small B/W TV set.
Answer go to a convenient place: Buying a reader.
Answer none: But on the way to buying a reader or hopefully going to a convenient place.

Question 3.

Answer 6-10: All received
Answer 11+: All.

Question 4.

Answer highly: Word "much" converted to "some".
Answer hardly: On my job now.

Question 5.

Answer all checked: Papers not accepted submitted elsewhere.

Question 6.

Answer yes: But it gains others who need the pages.
Most likely.
But it is still experimental. Give it a chance.
Loses some but gains others that are too long for publication elsewhere.
Probably. Difficult to be sure since it is a new journal.
At least it would lose mine.
But because of the format, gains others. Balance probably even.

Answer no: Don't know but I suspect not since alternatives are so few.

I feel there is more prestige in microform.

Question 7.

Answer yes: Inconvenient and costly.

But not good.

Probably, I don't really know.

New one. I haven't used it yet, don't know how well it works.

At cost.

But only electrostatic process. Not clear or good type.

At an inconvenient place.

With inconvenience.

Very difficult to access, though.

Question 8.

Answer 1: For use with students.

Answer 2-3: Good idea.

This is the best offer yet--a postcard return to get paper copies of wanted articles only.

No answer: Probably too expensive (postage).

Depends on the article content; question is not very good.

Question 9.

Answer fiche: With option of question 8.

With option of #8, option of Finite String as part of this option, devote several cards of an issue to microfiche readers, their advantages and disadvantages and cost.

(To "mixed") NO! One format only.

Answer mixed: Fiche with option to order hard copy.

Bit depends on which goes where.

Answer other: Either fiche or paper but not mixed.

Either fiche or mixed. No paper.

Paper and mixed. Depends on mix.

Question 10.

Answer no: Would use a library copy and xerox.

Probably not.

Offer on paper only.

Answer ? Yes and no; pay more for the larger journal to continue; prefer microfiche.

Stupid question--depends on question 8 situation. If paper copies of separate articles not available probably so--otherwise not.

Question 11.

Answer continue: Continue a "fairly" satisfactory method.

Would buy "possibly if other material also available."

Continue an "unsatisfactory" arrangement.

Continue a-~~satisfactory~~ arrangement for ...

Continue an "un" satisfactory...

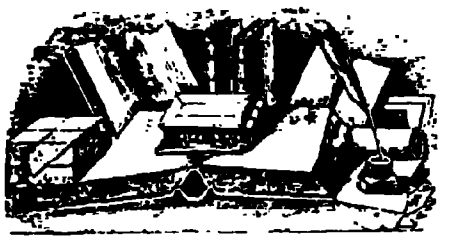
Continue to "look for" satisfactory...

Answer not read: I find microfiche inconvenient but do read articles of great interest.

Answer other: Not read as much as I would if it were on paper."

Question 12.

The following are not suitable topics for ACL to publish on: Psychological applications social science applications, analysis of literature, instructional systems, programming languages, and information structures.



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