THE FINITE STRING

George E Heidorn has accepted appointment as Editor.of
AJCL   His term begins with the first.issue for 1979

The experiment with a microfiche journal is over.   The
next issue of the journal will be on paper, with possible
microfiche supplement.

The retiring Editor apologizes to the membership for the
long delay in release of the present material for publica-
tion.   Grave personal difficulties interfered with all of
Hays''s routine activities during the period, and voluntary
activities necessarily suffered most

Released for publication March 25, 1979.

American Journal of Computational Linguistics

CONTENTS

ASSOCIATION FOR COMPUTATIONAL LINGUISTICS

MINUTES: 16th Annual Business Meeting
26 July 1978
University of Illinois, Urbana, Illinois
Jonathan Allen, President, presiding

MINUTES OF THE PREVIOUS MEETING

Allen noted that the minutes of the previous meeting had been published
in the Finite String, Volume 14, Number 3, Microfiche 65 of the American
Journal of Computational Linguistics.

FINANCIAL STATUS

Don Walker, Secretary-Treasurer, reviewed the financial status of the
Association, a copy of which is attached to these Minutes. He presented
income and expenses both for 1977 and for 1978 through 21 July. The
balances of $6,332.19 for 1977 and $7,060.63 for 1978 constitute assets
of $13,392.82. However, the major costs for AJCL for the current year
are yet to be incurred, and dues for AFIPS have not yet been billed. At
the same time, the $1,000 advance to cover costs of the TINLAP-2 Meeting
is likely be returned, along with a portion of the excess of income over
expenses, which will be shared with ACM/SIGART.

The indebtedness of the Association to the Center for Applied
Linguistics, which housed the previous Secretariat, has been paid off.
Of the total of $13,486.06, funds from the previous Secretariat provided
$9,913.92; $3,572.14 was taken out of income for 1977.

Walker remarked that the income item from AFIPS for 1977 of $2,365,
which reflected a disbursement of surplus funds from the National
Computer Conference, was unlikely to be repeated again soon. AFIPS is
in the process of creating a new journal, ABACUS, modeled after
Scientific American, and future surpluses probably will be used to
defray or at least to backup the startup costs. The journal is expected
to be self-sustaining, and might eventually show a profit.

The current balance in the TINLAP-1 Account is $109.41; approximately 75
copies remain.

MEMBERSHIP

Walker reported membership figures for 1977 of 500 individual and 201
institutional, for a total of 701. The current figures for 1978,
through 21 July, are 405 individual and 208 institutional, for a total
of 613. A slightly more detailed breakdown is attached to these
Minutes.

EDITOR'S REPORT

Dave Hays, Editor of the AJCL, announced that he was resigning, effective at the end of the year. The next issue will include the TINLAP Proceedings; the final issue of the current year will contain a complete index for the five years of its publication. The Journal was established in 1974 as an NSF-sponsored experiment in microfiche publication. Anticipating the implications of George Heidorn's survey (see below), Hays remarked that this mode of publication is likely to be replaced by microprocessor technology and might never receive a full scale trial.

Allen expressed the gratitude of the Association to Hays for his devotion, his constructiveness, and his tireless efforts in establishing and sustaining the AJCL. This tribute was affirmed by the members. Allen then announced that Heidorn, currently Associate Editor, would replace Hays as Editor in January.

A NEW FORMAT FOR THE AJCL

Heidorn presented the results of his survey of the membership regarding a new format for the AJCL. Of 513 questionnaires mailed (to both current members and to members who paid for 1977 but not yet for 1978); 212 were returned. The responses favored creation of a hard copy edition, similar in format to the Communications of the ACM, with or without an accompanying microfiche version. Most members felt that such a change would encourage a wider readership and an increase in the submission of techical articles. A more comprehensive report by Heidorn is included elsewhere in this issue.

Allen reported that the Executive Committee, after reviewing Heidorn's findings, has decided to issue the Journal in the new format with both hard copy and microfiche versions sent to each member, beginning with the first issue of 1979. The microfiche also may contain appendixes for technical articles, program listings, and other material of interest to the membership but less appropriate for inclusion in hard copy form, like the list of members.

NEXT MEETING

Allen stated that a decision about the time and place of the 1979 meeting had not yet been made. Asilomar, near Monterey in California, is being considered, possibly around the time of the next International Joint Conference on Artificial Intelligence, which will be held in Tokyo from 20 to 24 August. In the discussion, members expressed concern that the choice should not discourage attendance by graduate students.

For 1980, the Executive Committee recommended that a third TINLAP meeting be held. The President, Vice President, and Secretary-Treasurer constitute an interim committee to investigate this possibility and to negotiate with SIGART, as appropriate. Allen also remarked that an offer already had been received from Aravind Joshi to host TINLAP-3 at the University of Pennsylvania.

NOMINATIONS FOR OFFICERS FOR 1979

Aravind Joshi, reporting for the Nominating Committee (Joshi, Petrick, and Chapin), announced the following nominations for officers for 1979:

Nominating Committee: Jonathan Allen, MIT.
Executive Committee: Stanley Rosenschein, RAND
Secretary-Treasurer: Donald Walker, SRI International
Vice President: Bonnie Lynn Webber, University of Pennsylvania
President: Ronald Kaplan, Xerox Palo Alto Research Center

No additional nominations were received from the floor. Allen called for a vote, which was unanimous, and the slate was declared elected.

NEW BUSINESS

Carol Lane presented a resolution supporting the ratification of the Equal Rights Amendment to the U.S. Constitution. After extensive discussion and after motions to amend and to table were defeated, the members affirmed the following substitute resolution by a vote of 20 to 13:

WHEREAS, inclusion in the Constitution of these United States is the basic unalienable right of every citizen;

WHEREAS, the Association for Computational Linguistics views as intolerable the selective exclusion of over one-half the population of this country;

WHEREAS, the Equal Rights Amendment, writing women into the Constitution, must be ratified by three-fourths of the states (38) prior to its incorporation

THEREFORE, BE IT RESOLVED, that all future conventions, meetings, and conferences of the Association for Computational Linguistics will, for the duration of time during which the Equal Rights Amendment is under consideration by the several states of the United States, be held only in those states that have ratified the Equal Rights Amendment.

RESOLUTIONS

Having set out in advance the syntax of his report for the Resolutions Committee, Ron Kaplan expressed the gratitude of the Association to Dave Waltz, his session organizers, and the University of Illinois for the organization and conduct of the meeting; to the National Science Foundation, and particularly to Carol Ganz Brown, for its financial support; to the current officers for their constructive-efforts during the first part of their elective term (and with encouragement to continue these efforts for the rest of the year); to the retiring members of the AJCL Editorial Board--Robert Barnes, Fred Damerau, Gary Martins, John Olney, and Naomi Sager--for five years of effective service; to Dave Hays for his countless hours and fruitful endeavors in

realization of the <u>AJCL</u>; and to George Heidorn for his willingness to become the new editor.

Dave Hays called attention to the efforts of Martin and Iris Kay in the preparation of the <u>AJCL</u> Bibliography, and they were duly included in the list of resolutions.

The members affirmed these sentiments enthusiastically, and Allen directed the Secretary-Treasurer to express the appreciation of the Association formally to Dave Waltz.

The meeting adjourned.

Donald E. Walker
Secretary-Treasurer

Attachments: Financial Status, Membership Status, Officers for 1979

ASSOCIATION FOR COMPUTATIONAL LINGUISTICS

Secretary-Treasurer's Report
(as of 21 July 1978)

FINANCIAL STATUS	1977	1978
Income:		
Dues	$13285.74	$11337.73
Back Issues	1790.00	825.00
Meetings	1395.00	
AFIPS	2365.00	
Mailing Labels	62.40	107.75
Interest	352.13	246.58
TINLAP-1 Account	435.00	52.50
	————	————
	$19685.27	$12569.16
Expenses:		
AJCL Production	$ 4125.20	$ 1110.76
AJCL Bibliography	1412.50	1084.67
AJCL Editorial	208.61	385.33
Meeting Expenses	390.65	1000.00
AFIPS Dues	500.00	
Secretariat Services	1538.26	1046.00
Postage	839.60	675.62
Supplies	370.02	55.27
Printing	83.60	143.28
TINLAP-1 Account	312.50	7.50
Center for Applied Linguistics	3572.14	
	————	————
	$13353.08	$ 5508.53
Balance:	$ 6332.19	$ 7060.63
Assets:		
Savings		$11207.54
Checking		2153.25
Petty Cash		32.03
		————
		$13392.82

Center for Applied Linguistics Account

Debt (as of 3-14-77)	$13486.06
Paid (out of 1976 funds)	9913.92
(out of 1977 funds)	3572.14

	0.00

TINLAP-1 Account

Current Balance	$109.41

MEMBERSHIP STATUS	1977		1978	
Individual	500		405	
US		364		300
Foreign		136		105
Institutional	201		208	
US		92		109
Foreign		109		110
Special		19		19
TOTALS	701		613	

ASSOCIATION FOR COMPUTATIONAL LINGUISTICS

Officers for 1979

Dr. Ronald M. Kaplan
Xerox Palo Alto Research Center
3333 Coyote Hill Road
Palo Alto, CA 94304

President
415:494-4416

Professor Bonnie Lynn Webber
Computer and Information Science
The Moore School
University of Pennsylvania
Philadelphia, PA. 19104

Vice President
215:243-8540

Dr. Donald E. Walker
Artificial Intelligence Center
SRI International
Menlo Park, CA 94025

Secretary-Treasurer
415:326-6200x3071

Dr. Jerry R. Hobbs
Artificial Intelligence Center
SRI International
Menlo Park, CA 94025

Executive Committee
(1977 - 1979)
415:326-6200x2229

Dr. Bertram C. Bruce
Bolt Beranek and Newman
10 Moulton Street
Cambridge, MA 02138

Executive Committee
(1978 - 1980)
617:491-1850

Dr. Stanley J. Rosenschein
Rand Corporation
1700 Main Street
Santa Monica, CA 90406

Executive Committee
(1979 - 1981)
213:393-0411

Dr. Stanley R. Petrick
IBM Watson Research Center
P.O. Box 218
Yorktown Heights, NY 10598

Nominating Committee
(1977 - 1979)
914:945-2175

Dr. Paul G. Chapin
Linguistics Program
National Science Foundation
Washington, DC 20550

Nominating Committee
(1978 - 1980)
202:254-6326

Professor Jonathan Allen
Electrical Engineering
MIT, 36-575
Cambridge, MA 02139

Nominating Committee
(1979 - 1981)
617:253-2509

Dr. George E. Heidorn
IBM Watson Research Center
P.O. Box 218
Yorktown Heights, NY 10598

Editor, AJCL
914:945-2776

OFFICERS
ASSOCIATION FOR MACHINE TRANSLATION AND COMPUTATIONAL LINGUISTICS (1963-1968)
ASSOCIATION FOR COMPUTATIONAL LINGUISTICS (1968-1979)

	1963	1964	1965	1966
President	Yngve	Hays	Lehmann	Garvin
Vice-Pres	Hays	Alt	Garvin	Oettinger
Sec-Treas	Josselson	Josselson	Josselson	Josselson
Executive	Rhodes	Sebeok	Sebeok	Sebeok
Committee	Garvin	Garvin	Hockett	Hockett
---------	Lehmann	Lehmann	Kuno	Prendergraft
Editor (FS)	Roberts	Roberts	Roberts	Roberts
Nominating	See	Yngve	Yngve	Yngve
Committee	Oettinger	Oettinger	Hays	Hays
---------	Lamb	Lamb	Lamb	Lieberman

	1967	1968	1969	1970
President	Kuno	Walker	Kay	Plath
Vice-Pres	Walker	Mersel	Plath	Friedman
Sec-Treas	Josselson	Josselson	Josselson	Josselson
Executive	Satterthwait	Satterthwait	Satterthwait	Wall
Committee	Hockett	Fromkin	Fromkin	Fromkin
---------	Pendergraft	Pendergraft	Montgomery	Montgomery
Editor (FS)	Roberts	Roberts	Roberts	Roberts
Editor (MTCL)	Yngve	Yngve	Yngve	Yngve
Nominating	Garvin	Garvin	Garvin	Kay
Committee	Hays	Kuno	Kuno	Kuno
---------	Lieberman	Lieberman	Walker	Walker

	1971	1972	1973	1974
President	Friedman	Simmons	Barnes	Woods
Vice-Pres	Simmons	Fromkin	Woods	Wall`
Sec-Treas	Josselson	Roberts	Roberts	Roberts
Executive	Wall	Wall	Martins	Martins
Committee	Robinson	Robinson	Robinson	Joshi
---------	Montgomery	Chapin	Chapin	Chapin
Editor (FS)	Roberts	Roberts	Roberts	
Editor (AJCL)				Hays
Nominating	Kay	Kay	Simmons	Simmons
Committee	Plath	Plath	Plath	Barnes
---------	Walker	Friedman	Friedman	Friedman

	1975	1976	1977	1978
President	Joshi	Petrick	Chapin	Allen
Vice-Pres	Petrick	Grimes	Allen	Kaplan
Sec-Treas	Roberts	Roberts	Walker	Walker
Executive	Martins	Diller	Diller	Diller
Committee	Rieger	Rieger	Hobbs	Hobbs
---------	Nash-Webber	Nash-Webber	Nash-Webber	Bruce
Editor (AJCL)	Hays	Hays	Hays	Hays
Assoc Editor			Heidorn	Heidorn
Nominating	Simmons	Joshi	Joshi	Joshi
Committee	Barnes	Barnes	Petrick	Petrick
---------	Woods	Woods	Woods	Chapin

	1979	1980	1981	1982
President	Kaplan			
Vice-Pres	Webber			
Sec-Treas	Walker			
Executive	Rosenschein	Rosenschein	Rosenschein	
Committee	Hobbs			
---------	Bruce	Bruce		
Editor (AJCL)	Heidorn			
Assoc Editor				
Nominating	Allen	Allen	Allen	
Committee	Petrick			
---------	Chapin	Chapin		

FS = <u>The</u> <u>Finite</u> <u>String</u>
MTCL = <u>Machine</u> <u>Translation</u> <u>and</u> <u>Computational</u> <u>Linguistics</u>
AJCL = <u>American</u> <u>Journal</u> <u>of</u> <u>Computational</u> <u>Linguistics</u>

N S F   Support for Computational Linguistics

Paul G. Chapin, Director of the Linguistics Program of the
National Science Foundation, announced the following grants
for research of obvious relevance to computational linguistics.

Language Universals Archiving Project

Charles A. Ferguson and Joseph Greenberg
Stanford University - $49,200 - 13 months

Computer Studies in Formal Linguistics

Joyce Friedman
University of Michigan - $40,000 - 24 months
(The Intelligent Systems Program of NSF awarded the same amount)

Computational Complexity of Grammar & NL Recognition Problems

William Rounds
University of Michigan - $44,600 - 24 months

American Journal of Computational Linguistics

N S F   Support for Computational Linguistics

During the Fiscal Year 1978, the Division of Science Information
of NSF issued at least the following grants for support of
research relevant to computational linguistics.

Correlation of Language Structure with Information
Zellig S. Harris
University of Pennsylvania - $163,329 - 29 months

Integrated Man/Machine Interface for Network Resource Utilization
Martha E. Williams
University of Illinois - $174,432 - 24 months

High-level Language Subcommittee

The Microprocessor Standards Committee of the IEEE formed a
subcommittee to work on standsrds for the five high-level
languages widely used in microprocessor applications: Basic,
Fortran, Cobol, PL/M, and Pasqal. The object foreseen was the
identification and endorsement of appropriate standards. The
first meeting was called in October by Bruce Ravenel of Language
Resources, 1311 Lombard Street, San Francisco, CA 94109.

Manpower Survey in Linguistics

What fields need linguists or persons with some linguistic know-
ledge? What are the "demands and perspectives" of present and
possible employing institutions? Anyone with information
relevant to these issues can correspond with Dr. Walther Kindt,
Fakultät für Linguistik und Literaturwissenschaft, Universitat
Bielefeld, Postfach 8640, 4800 Bielefeld 1, Germany.

Computational Proofreading

The detection of orthographic errors in keyboarding of Swedish
text is the topic of work undertaken by Rolf Gavare, Department
of Computational Linguistics, Göteborgs Universitet, Norra
Allegatan 6, S-413 01 Göteborg, Sweden, who invites correspondence.

MT: English and Thai via Montague Grammar

The work of Joyce Friedman is being applied in work on transla-
tion. Kurt Godden, 1408 E. 27, Lawrence, KS 66044, invites
contact.

ASSOCIATION FOR WOMEN IN COMPUTING.

AWC was founded in 1978 to promote communication, professional development and advancement, and education.. Membership is open without restriction. The Correspondent of AWC is Anita Cochran, 5A137 Bell Laboratories, Murray Hill, NJ 07974; 201-582-7817.

SPELLING CORRECTION

A program to check spelling in English text has been written by Ralphe E. Gorin, AI Laboratory, Computer Science Department, Stanford University, CA 94305, with additions by William Plummer and Jerry Wolf of BBN and Richard Johnsson and Philip Karlton of Carnegie Mellon University.

ONLINE BIBLIOGRAPHY IN SIGN LANGUAGE AND RELATED AREAS

The Syracuse Information Retrieval Experiment system has been adapted by Jim Bourg of the Gallaudet College Library and is being used by William C. Stokoe, Linguistics Research Lab, Gallaudet College, Kendall Green, Washington, DC 20002, for a pscyho- and sociolinguistic bibliography. Anyone with a console may inquire about access; no charge is levied at present.

Request for reprints

ANNUAL REVIEW OF INFORMATION SCIENCE AND TECHNOLOGY

Volume 14 of ARIST is in preparation. Authors of chapters need help in finding relevant recent publications. They will appreciate receiving offprints from authors at their respective addresses.

If the appropriate chapter writer is not apparent, write to

> Martha E. Williams
> Editor, ARIST
> R.R. No. 1
> Monticello, Illinois 61856

CHAPTER TOPICS AND WRITERS

COMPUTER ARCHITECTURE FOR NATURAL LANGUAGE AND IR APPLICATIONS

Professor P. Bruce Berra
 (& Ellen Oliver)
Syracuse University
Syracuse, New York 13210

RETRIEVAL TECHNIQUES

Professor Michael McGill
School of Information Studies
113 Euclid Avenue
Syracuse University
Syracuse, New York 13210

COST ANALYSIS OF SYSTEMS AND SERVICES

Mr. Colin Nick
Applied Communication Research
P.O. Box 5849
Stanford, California 94305

LIBRARY AUTOMATION

Ms. Mary Jane Probst Reed
Associate Director for
 Research and Planning
Washington State Library
Olympia, Washington 98504

Mr. Hugh Vrooman
Illinois State Library
Centennial Building
Springfield, Illinois 62706

INFORMATION SYSTEMS IN LATIN AMERICA

Professor Tefko Saracevic
School of Library Science
Case Western Reserve University
Cleveland, Ohio 44106

> (Additional authors for this
> and following chapters on
> next frame.)

INFORMATION SYSTEMS IN LATIN
AMERICA (continued)

Gilda Braga
Instituto Brasileiro de infor-
 macao em Ciencia e Technologia
Av. General Justo 171; 4º
Rio de Janeiro, Brazil

Alvaro Quijano Solis
Biblioteca Daniel Cosio
 Villegas
El Colegio de Mexico
Camino Al Ajusco No. 20
Apartado Postal 20-671
Mexico 20, D.F.
Mexico

INFORMATION SYSTEMS FOR
CONSUMER CONCERNS

Professor Vivian Sessions
School of Library Science
McGill University
3459 McTavish Street
Montreal, Quebec H3A 1Y1
Canada

COMPUTERS AND PUBLISHING

Mr. David Staiger
American Institute for Aero-
 nautics & Astronautics
1290 Avenue of the Americas
New York, New York 10019

EDUCATION AND TRAINING
FOR ONLINE SYSTEMS

Ms. Judy Wanger
1523 Sixth Street, Suite 12
Santa Monica, California 90401

DATA BASE MANAGEMENT SYSTEMS

Dr. Ronald Wigington
 (& Michael A. Huffenberger)
Chemical Abstracts Service
2540 Olentangy River Road
Columbus, Ohio 43202

SYSTEMS DESIGN--PRINCIPLES
AND TECHNIQUES

Dr. Ronald Wyllys
Graduate School of Library
 Science
University of Texas
Austin, Texas 78712

FUNDAMENTAL PRINCIPLES AND
THEORIES OF INFORMATION SCIENCE

Dr. Pranas Zunde
School of Information and
 Computer Science
Georgia Institute of Technology
Atlanta, Georgia 30332

Summer Linguistics at Texas

The University of Texas at Austin announces a special Summer Linguistics Program which will consist of a substantial offering of graduate courses given by our own faculty members and a distinguished list of visiting scholars. In addition to these courses, workshops and seminars (for credit as conference courses by arrangement with individual faculty members) will be available on topics such as syntactic universals, conditions on rule application, opacity and scope, formal vs. substantive explanation in phonology, etc. We invite applications from graduate students in linguistics and allied disciplines such as education, English, foreign languages, psychology, philosophy, anthropology, and others.

The list of courses and instructors will include the following:

LIN 380K Generative Phonology—Robert
T. Harms
LIN 380L Transformational Grammar—
Jorge Hankamer and Ivan Sag
LIN 381M Phonetic Theory—Peter MacNeilage
LIN 384 Outline of Turkish Syntax—Jorge
Hankamer (tentative)
LIN 393 Semantics—Robert E. Wall
LIN 393 Seminar in Phonetics and
Phonology—Björn Lindblom
LIN 393 Seminar in Syntax and Semantics—
Emmon Bach and Barbara Partee
LIN 394 New Directions in Historical
Linguistics—Robert D. King
LIN 396 Seminar in Linguistic
Variation—John Baugh

In addition to the above-listed faculty members, the following scholars will be available for individual consultation: Lee Baker, Peter Cole, David DeCamp, Polly Jacobson, Lauri Karttunen, W. P. Lehmann, Fritz Newmeyer, Susan Schmerling, and others. Several intensive Oriental and European language courses will also be taught as a part of the regular UT summer session.

Low cost accommodations will be available in housing cooperatives. Classes will begin June 13 and exams will end July 20; the Program will thus not conflict with the LSA Linguistic Institute in Salzburg.

Tuition and fees: For Texas residents, the price of summer courses is $64.70 for one three-hour course, $89.90 for two three-hour courses. For out-of-state residents, it is $159.70 for one three-hour course, $304.90 for two three-hour courses. In addition, there is a $10.00 property fee, refundable at the end of the course.

For application materials, please complete the detachable section and mail it to:

Summer Linguistics Program
Department of Linguistics
University of Texas at Austin
Austin, Texas 78712

DEADLINE: May 1, 1979

PHD PROGRAMS IN COMPUTATIONAL LINGUISTICS

During the summer of 1978, Alan K. Melby wrote to many
American universities, asking about the graduate work
in computational linguistics. He has supplied a copy
of his list of affirmative answers, presented here in
the casual format of its compilation. Melby points out
that MIT and Yale did not respond but would be considered
by a student planning work on computers and language.

California

Ken Wexler
School of Social Sciences
University of California
Irvine, CA 92717

   (cognitive science, mathema-
   (tical linguistics

Electrical Engineering Dept.
University of California
Los Angeles, CA 90024

   (some work in AI

Clara Bush
Department of Linguistics
Stanford University
Stanford, CA 94305

   (under Prof. Terry Winograd

Connecticut

David Michaels
Room 230 H.R. Monteith Bldg.
University of Connecticut
Storrs, CT 06268

   (analysis and synthesis of
   (speech--Haskins Laboratory
   (connection

Illinois

G. K. Krulee
Department of Linguistics
Northwestern University
Evanston, IL 60201

   (with Computer Science Dept.

C. C. Cheng
Linguistics
University of Illinois
Urbana, IL 61801

Kansas

David Dinneen
Department of Linguistics
University of Kansas
Lawrence, KS 66045

Massachusetts

Emmon Bach
Department of Linguistics
University of Massachusetts
Amherst, MA 01002

Michigan

Joyce Friedman
Computer and Communication Sciences
University of Michigan
Ann Arbor, MI 48108

   (with qualifications--ask JF

Minnesota

Center for Research in Human
  Learning
University of Minnesota
Minneapolis, MN 55455

   (psychologists with interest in AI

New York

David Hays
State University of New York
Buffalo, NY 14214

Lewis Levine
Department of Linguistics
Washington Square
New York, NY 10003

  (students can work under
  (Naomi Sager

Pennsylvania

Simon Belasco
Department of Linguistics
Pennsylvania State University
University Park, PA 16802

  (qualified "yes"

Rhode Island

J. J. Wren
Box E
Brown University
Providence, RI

Texas

Department of Linguistics
University of Texas
Austin, TX 78712

Washington, D.C.

Department of Linguistics
Georgetown University
Washington, DC 20007

JOURNAL: C L & C L

COMPUTATIONAL LINGUISTICS AND COMPUTER LANGUAGES

CONTENTS OF NUMBER 11:

---

* * * * *

New Journal

DISCOURSE PROCESSES
A MULTIDISCIPLINARY JOURNAL

CONTENTS: VOLUME 1, NUMBER 1, JANUARY-MARCH 1978

B O O K S: Short Notice

Igor A. Mel'cuk.   Studies in Dependency Syntax.   Ann Arbor: 1979

Karoma Publishers, Inc.   163 + ix pp.,   paper only $4.50
6 by 9 inches   ISBN 0-89720-001-2

I. Mel'čuk, R. Ravič.   Automatic Translation, 1964-1970.

Departement de linguistic et   Case postale 6128, Succursale "A"
philogie   Montreal, P.Q. H3C 3J7
Universite de Montreal

Ce volume qui est une suite au guide bibliographique analytique de
la T(raduction) A(utomatique), publie a Moscou en 1967, recense
1357 ouvrages de la T.A. et les domaines voisins, parus entre 1964
et 1970, aussi bien en U.R.S.S. qu'en Occident. Pour la plupart
des ouvrages recenses, on a donné un résumé détaillé (en russe) qui
se veut une description suffisante du contenu. Le guide est desti-
né aux linguistes, aux traducteurs et aux informaticiens, chacun y
pouvant trouver des renseignements utiles. Prix approximatif du
volume: $16.

This volume, a continuation of the Analytical Bibliographical Guide
to A(utomatic) T(ranslation), published in Moscow in 1967, includes
1357 works in and on TA, as well as neighboring domains, which ap-
peared between 1964 and 1970 either in the Soviet Union or in the
West. For most of the publications listed, a detailed abstract is
provided, which is intended to adequately represent the contents of
the corresponding item. The guide is addressed to linguists, trans-
lators and information processing specialists all of whom will hope-
fully find in it useful data. Approximate price will be $16.

J.D. Goldstein, D.W. Lakamp, A. Pietrzyk. INFORMATION SERVICES ON
RESEARCH IN PROGRESS: A WORLDWIDE INVENTORY.

National Technical Information   462 pp., softcover
Service, US Dept. of Commerce   PB-282 025/AS
5285 Port Royal Road $14.50 hard copy
Springfield, VA 22161 $3.00 microfiche

Part I: World Trends in Information on Research in Progress· An
           Overview

Part II: Profiles of Information Systems and Services on Research
           in Progress

Part III: Indexes to organization and system names, organization
           and system acronyms, persons respinsible and subject
           coverage given

Starr Roxanne Hiltz, Murray Turoff. THE NETWORK NATION: HUMAN
COMMUNICATION VIA COMPUTER. Addison-Wesley: 1978

Hardbound ISBN 0-201-03140-X c. $26.50
Paperbound ISBN 0-201-03140-8 c. $14.50

The Nature of Computerized Conferencing

Potential Applications and Impacts of Computerized Conferencing

Projecting the Future

F.W. Lancaster. TOWARD PAPERLESS INFORMATION SYSTEMS. Academic 1978

179 pp., $13.50   ISBN 0-12-436050-5

In this nontechnical presentation the author first describes the
paperless information/communication systems currently being developed
for intelligence agencies. Then existing scientific and technological
communication systems are critiqued. Finally the intelligence
design is reformulated for the science and technology environment.

L. Bourrelly and E. Chouraqui. THE DOCUMENTATION SYSTEM SATIN 1.
VOL. 1 - GENERAL DESCRIPTION AND USER'S MANUAL (1974) 398 PP.
VOL. 2 - SYSTEM GENERATION AND SET-UP INSTRUCTIONS (1978) 397 PP.

SATIN 1 is implemented at the "Laboratoire d'Information pour les
Sciences de l'Homme" in Marseille and is designed specifically for
the documentation processes in the humanities and social sciences,
archeology, geography, history, etc., and permits the representation
of information about artifacts of many kinds (paintings, sculputures
etc.) in addition to standard document content.

Herbert E. Bruderer.   SPRACHE - TECHNIK - KYBERNETIK.

Aufsätze zur· Sprachwissenschaft, maschinellen Sprachverarbeitung, künstlichen Intelligenze und Computerkunst. Verlag Linguistik, Münsingen/Bern 1978, 187 Seiten, 39 Schweizer Franken (Foreign orders must be prepaid: Surface 44 Swiss Francs, Air 50 Swiss Francs), ISBN 3-85784-000-5

Herbert E. Bruderer.   HANDBOOK OF MACHINE TRANSLATION AND MACHINE-AIDED TRANSLATION. AUTOMATIC TRANSLATION OF NATURAL LANGUAGES AND MULTILINGUAL TERMINOLOGY DATA BANKS. New York 1978.

North-Holland Publishing Company 959 Pages, ISBN 0-7204-0717-6.

Foreward by Prof. K. Bauknecht, Department of Computer Science, University of Zurich. English translation by the Commission of the European Communities, Brussels. c.1600 item bibliography.

Herbert E. Bruderer (Hg./ed.).   AUTOMATISCHE SPRACHÜBERSETZUNG. (in preparation)

Wissenschaftliche Buchgesellschaft, Darmstadt 1979. etwa 450 Seiten (Wege der Forschung, Band 272), 41-45 DM. ISBN 3-534-06312-0, nur für Mitglieder der Buchgesellschaft.

YALE A.I. PROJECT: RESEARCH REPORTS AVAILABLE

Send orders to: *M.S. Barham, Adm. Asst., A.I. Project, Department of Computer Science, Yale University, 10 Hillhouse Ave.-320DL New Haven, CT 06520*

< > # 78 - Riesbeck, C.K. & Schank, R.C.   - Comprehension by Computer: Expectation-Based Analysis of Sentences In Context.

< > # 88 - Lehnert, W.G.   - The Process of Question Answering

< > #116 - Cullingford, R.C. - Script Application: Computer Understanding of Newspaper Stories

< > #127 - Schank, R.C. & Carbonell, J.G.   - Re: The Gettysburg Address

< > #128 - Schank, R.C., Wilensky, R., Carbonell, J.G., Kolodner, J.L. & Hendler, J.A.   - Representing Attitudes: Some Primitive States

< > #131 - Lehnert, W.G.   - Representing Physical Objects In Memory

< > #137 - Charniak, E.   - On The Use Of Framed Knowledge In Language Comprehension

< > #139 - Riesbeck, C.K. & Charniak, E.   - Micro-SAM and Micro-ELI: Exercises in Popular Cognitive Mechanics

< > #140 - Wilensky, R.   - Understanding Goal-Based Stories Ph.D. Thesis

< > #141 - Schank, R.C.   - Inference in the Conceptual Dependency Paradigm: A Personal History

< > #142 - Kolodner, J.L.   - Memory Organization For Natural Language Data-Base Inquiry

< > #143 - Schank, R.C. & Birnbaum, L.A.   - Real-Time Integrated Parsing

< > #144 - Schank, R.C. & Lebowitz, M.   - Big Words

< > #145 - Schank, R.C.   - Interestingness: Controlling Inferences

< > #146 - Carbonell, J.G. Cullingford, R.E. & Gershman, A.V.   - Knowledge-Based Machine Translation

SUMMARY OF RESEARCH ON COMPUTATIONAL ASPECTS OF

EVOLVING THEORIES

Raymond D. Gumb

Temple University

The concept of an evolving theory [3] is a natural extension of concepts in free tense logic with equality. In the semantics of free tense logic, an individual can have a property at one time that it does not at another, the domain of discourse can vary with the passage of time as individuals are born and die, and individual terms can refer at one time but not at another. Understanding a theory to be a set of sentences in the language of free tense logic with equality, an evolving theory is an indexed set of theories ordered in time. Intuitively, an evolving theory might represent the life work of a thinker, where the individual theories in the evolving theory correspond to chapters of the life work written at different times. The evolving theory reflects changes in the thinker's views with the passage of time.

Evolving theories have been studied from both semantic and proof theoretic perspectives, and various concepts such as the semantic concept of satisfiability and the proof theoretic concept of consistency have been extended to apply to evolving theories [3]. The semantics is given in terms of metaphor theory which stands intermediate

between Leblanc's truth-value semantics and model theory
and translates readily into both. The deductive system
for (a class of) evolving theories is called the _forest
method_ because a tree is generated for each point in time.
The forest method, in effect a generalization of Kripke
tableaux constructions, is mechanizable. The forest
method is correct with respect to the semantics [3].

The forest method can be applied wherever the restriction
on the temporal order relation has the _computable Kripke
closure property,_ a property of properties of relations
which has been characterized model theoretically in [7].
The computable Kripke closures are a subclass of the
monotonic closures [7], which have closure properties much
like transitivity (a computable Kripke and monotonic closure).
A preservation theorem giving the syntactic form of
axiomatizations of the first-order monotonic closures [7]
suggests a generalization of the Roy-Warshall transitive
closure algorithm. The preservation theorem might also
be used to determine (much as an entry in an engineering
handbook) whether, given a property of relations Pr, there
is a Pr-closure algorithm.

Evolving theories can be based in other intensional
logics such as as modal [4] and intuitionistic logics.
Some (but not all) of the logics underlying kinds of evolving
theories where the forest method is applicable can be
axiomatized [1, 6].

In certain (but not all) cases, the forest method (or restrictions of it) can be used to give effective proofs of the extended joint consistency theorem, a result which incorporates the Craig and Lyndon interpolation lemmas and the Robinson joint consistency theorem. Roughly, the theorem states that two theories T_1 and T_2 are mutually inconsistent just in case there is a separating sentence F such that F (not F) is a logical consequence of T_1 (T_2) and F "talks about" only individuals and relations that both T_1 and T_2 do. Effective proofs of the theorem are well-known in standard first-order logic, and similar results have been established in free logic with equality [5] and in a family of free modal logics with equality [4]. Since the proof is effective, a (depth first) algorithm can be extracted from it for constructing, given a closed forest for the union of T_1 and T_2, a separating sentence F.

Evolving theories, outfitted with additional devices to enhance their plausibility, appear to be a natural for representing temporal knowledge. When the extended joint consistency theorem holds for the representation language of a knowledge base and when an effective proof has been given, the separating sentence algorithm might be a useful tool for pinpointing inconsistencies in the knowledge base [2]. Only very restricted versions of the algorithms mentioned above have been programmed, those in LISP [2] and SNOBOL.

REFERENCES

[1] Barnes, R. and Gumb, R., "The Completeness of Presupposition-Free Tense Logic," Zeitschrift für mathematische Logik und Grundlagen der Mathematik, forthcoming. (Abstract in Journal of Symbolic Logic, 42(1977), 146-7.)

[2] Gumb, M. and Gumb, R., "Logical Techniques for Pinpointing Inconsistencies in the Knowledge Base," Proceedings of the 41st Annual Conference of the American Society for Information Science, 1978, forthcoming.

[3] Gumb, R. Evolving Theories. Flushing, N.Y.: Haven, forthcoming. (Abstracts in IJCAI5, v. 1, 567, and JSL, forthcoming.)

[4] -------, "An Extended Joint Consistency Theorem for a Family of Free Modal Logics with Equality," forthcoming.

[5] -------, "An Extended Joint Consistency Theorem for Free Logic with Equality," Notre Dame Journal of Formal Logic, forthcoming. (Abstract in JSL, 42(1977), 146.)

[6] Leblanc, H. and Gumb, R., "Soundness and Completeness Proofs for Three Brands of Intuitionistic Logic," forthcoming in a Haven anthology.

[7] Weaver, G. and Gumb, R., "First-Order Properties of Relations Having the Monotonic Closure Property," forthcoming. (Abstracts in Proceedings of the 1978 ACM Computer Science Conference, 19, and JSL, forthcoming.)

American Journal of Computational Linguistics

TAXONOMY: I N F O R M A T I O N   S C I E N C E S

The following taxonomy is that used by the journal INFORMATION SYSTEMS.

1   general aspects   □

2   analysis, modelling, description and evaluation
of information systems   □

2.1 analysis   □

2.2 design   □

2.3 modelling   □

2.4 description   □

2.5 implementation   □

2.6 evaluation   □

2.7 description of realized systems   □

3   data base systems   □

3.1 global aspects, global design   □

3.2 system analysis for DBS, userdemands   □

3.3 feasibility studies, evaluation of DBS,
summary of experiences   □

3.4 formal description of data base systems and
data base languages   □

3.5 data models, information models   □

3.5.1 hierarchic DM   □

3.5.2 network DM   □

3.5.3 relational DM   □

3.5.4 others   □

3.6 data definition languages (DDL)   □

3.7 data translation   □

3.8 procedural data manipulation languages (DML)   □

3.9 non-procedural (descriptive) DML, terminal languages
(interactive languages),natural language interfaces   □

3.10 dialog functions, computer assistance, computer guidance, dialog support, I/O-functions ☐

3.11 implementation aspects ☐

3.12 architecture of DBS, interfaces ☐

3.13 distributed DBS ☐

3.14 file management systems ☐

3.15 data structures, operations upon data structures ☐

3.15.1 data structures ☐
3.15.2 operations ☐
3.15.3 pictorial data structures and operations, data bases in computer graphics and CAD ☐

3.16 storage structures, access path, access methods, search strategies ☐

3.17 reorganization, selforganising structures, optimization ☐

3.18 storage technology, specialized hardware for DBS (data base processors) ☐

3.19 security, integrity ☐

3.20 privacy ☐

3.21 description of realized data base systems ☐

3.21.1 DBTG-based DBS ☐
3.21.2 relational-based DBS ☐
3.21.3.1 ADABAS ☐
3.21.3.2 DMS-II ☐
3.21.3.3 DMS-1100 ☐
3.21.3.4 IDS II ☐
3.21.3.5 IDMS ☐
3.21.3.6 IMS ☐
3.21.3.7 SYSTEM 2000 ☐
3.21.3.8 TOTAL ☐
3.21.3.9 others ☐

4 method and model base systems ☐

4.1 method base systems ☐

4.2 model base systems ☐

4.3 description of realized systems ☐

5 planning and decision support systems ☐

5.1 forecasting systems ☐

5.2 planning information systems ☐

5.3   decision support systems. ☐

5.4   control systems ☐

5.5   description of realized systems ☐

6   question answering systems, cognitive methods ☐

6.1   representation of knowledge, ☐

6.2   problem solving ☐

6.3   natural language systems ☐

6.4   pattern processing ☐

6.5   deduction and inference ☐

6.6   artificial intelligence methods, cognitive methods ☐

6.7   description of realized systems ☐

7   document retrieval systems ☐

7.1   indexing, classification, thesaurus problems ☐

7.2   evaluation measures ☐

7.3   documentation services ☐

7.4   library automation ☐

7.5   description of realized systems ☐

8   distributed systems ☐

8.1   distributed processing ☐

8.2   distributed storing ☐

8.3   distributed control ☐

8.4   data communication, protocols ☐

8.5   architecture, topology ☐

8.6   descript on of realized systems ☐

9   special application oriented information systems ☐

9.1   management information systems ☐

9.2   macro economic information systems ☐

9.3   information systems in public administration ☐

9.4   information systems in medicine ☐

9.5   technical information systems ☐

9.6   information systems in jurisprudence ☐

9.7   ecology information systems ☐

9.8   description of realized systems ☐

MACHINE AIDS TO TRANSLATION
A CONCISE STATE OF THE ART BIBLIOGRAPHY

WAYNE ZACHARY

Analytics
Willow Grove, Pennsylvania

Machine aids to translation, or MAT, is a loosely defined field whose boundaries shade gradually into such areas as computer science, information science, computational linguistics, and theoretical linguistics. It is therefore difficult to decide precisely what material belongs in a MAT bibliography. One can cast the net broadly and include a great deal of material that considers MAT only tangentially, or be more restrictive and include only the (much smaller body of) work which clearly concerns MAT. The latter course is taken here in order to avoid burying the essential literature under a mountain of peripheral references. Thus, the enormous body of work on fully automatic machine translation is not included (although Young (1978) contains an extensive survey of this literature). A few exceptions to this principle of inclusion (e.g., ALPAC, 1966) provide important contextual information concerning the history, current status, or future development of MAT.

While the history and current theoretical concerns of MAT are covered in the bibliography, the emphasis is on applications and operational
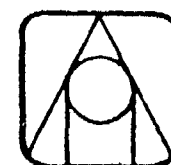
systems. This reflects the development of MAT as a more practical alternative to pure machine translation and its position as one of the only areas of computational lingustics that has progressed to the point of wide scale application.

A few other ground rules have been followed. First, since the field continues to change so rapidly and this is a state-of-the-art survey, few references over a decade old are included. Second, where a single MAT system is described almost identically in several research reports and/or publications in several languages, only a single reference is given, in English where possible. Third, works dealing strictly with hardware advances such as new graphics display technology, micropragrammable display fonts, or multilingual printers are also excluded.

This bibliography was compiled from a much larger one containing nearly 750 entries and is intended to provide a concise summary of the current work in the field with strong focus as stated above on machine aided translation systems that are presently in operation.*
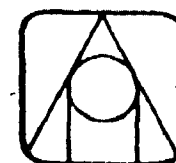
BIBLIOGRAPHY

ALPAC   (Automatic Language Processing Advisory Committee)
1966   Language and Machines - Computers in Translation and Linguistics
           National Academy of Sciences, National Research Council: Washington,
           D.C.

American Mathematical Society
1968   "Research on Machine Aids to an Editor of Scientific Translations."
           NTIS document PB-177 775.

Berzon, V.E.
1971   "Some Techniques for Formalizing the Process of Establishing
           U-Relations Between Sentences in a Corrective Text," in Nauchno-
           Tekhniceskaya Informatsia, Seriya 2, No. 8.

Bisby, R. and Kay, M.
1972   The MIND Translation System: A Study in Man-Machine Collaboration.
           NTIS Document Ad 749 000, Rand Corp.: Santa Monica, Calif.

Bruderer, H.E.
1977   "The Present State of Machine Aided Translation," Overcoming the
           Language Barrier, in Commission of the European Communities,
           pp 529-556.

Bruderer, H.E.
In Press Handbook of Machine and Machine Aided Translation, North
           Holland: New York (published in German in 1975).

Burge, John
1978   "The TARGET Project's Interactive Multilingual Dictionary,"
           Project Technical Report No. 13. Depts. of Modern Languages and
           Computer Science; Carnegie-Mellon University.

Charniak, E. and Wilks, Y.: eds
1976   Computational Semantics, North Holland: New York.

Chevalier M., Danserau, J., and Paulin, G.
1978   TAUM-METO: Description du Systeme. University de Montreal,
   Montreal, Canada.
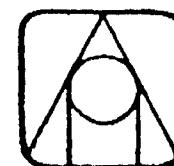
Commission of the European Communities
1977   Overcoming the Language Barrier: Third European Congress on
            Information Systems and Networks. Vol. 1. Munich: Verlag
            Dokumantations.

Daley, Cd. D.H., and Vechino, Lt. Col. R.F., USAF
1973   "The West German Federal Bureau of Languages and Machine Aided
            Translation in Germany." In Federal Linguist, Vol. 5, No. 3-4;
            pp 14-18.

Dubuc, Robert
1972   "TERMIUM: System Description," in Meta: Journal of Translation,
            Vol. 17, No. 4, pp 203-219.

Dubuc, Robert, and Gregoire, Jean-Francois
1974   "Banque de Terminologie et Traduction," in Meta: Journal of
            Translation Vol. 20, No. 4, pp 180-184, (in French).

Goetschalckx, J.
1974   "Terminology and Documentation in International Organizations,"
            in Babel, Revue Internationale de la Traduction, Vol. 20, No. 4,
            pp 185-187.

Grimes, Joseph E.
1970   "Computing in Lexicography," in The Linguistic Reporter, Vol. 12,
            Nos. 5-6, pp 1-4.

Hann, Michael
1974   "Principles of Automatic Lemmatisation," in ITL, Review of Applied
            Linguistics, Vol. 23, pp 3-22.

Hirschberg, Lydia
1965   "Dictionaries Automatiques pour Traducteurs Humains," in Journal
            des Traducteurs, Vol. 10, No. 3, p 78, (in French).

Hlavac, T.
1973   "Dealing with the Language Barrier by Means of Computer," in
            Kniznue and Ved. Inf. (Czcheoslovakia), Vol. 5, No. 2, pp 70-75.

Ivanova, I.S.
1969   "Problems of Automatic Thesarus Construction," in Nauchno-
            Tekhniceskaya Informatsiya, Seriya 2, No. 1, pp 17-20

Joint Publication Research Service
1977   "Machine-Assisted Translation in West Germany," translation of
            article by various authors, NTIS document JPRS 68726.
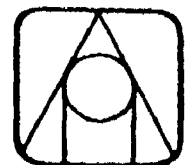
Jordan, S.R., Brown, A., and Hutton, F.C.
1977   "Computerized Russian Translation at ORNL," in Journal of the
            American Society for Information Science, January, pp 26-33.

Josselson, H.
1967   "Research in Automatic Russian-English Scientific and Technical
            Lexicography," Final Technical Report, Wayne State University.
            NTIS document PB-180 930.

Kay, Martin
1976   "The Proper Place of Man and Machines in Translation," in
            American Journal of Computational Linguistics, Microfiche 46.

Krollman, Fredrick
1971   "Linguistic Data Banks and the Technical Translator," in Meta:
            Journal of Translation, Vol. 16, Nos. 1-2, pp 117-124.

Krollman, Fredrick
1974   "Data Processing at the Translators Service," in Babel, Revue
            Internationale des Traducteurs, Vol. 20, No. 3, pp 121-129.

Krollman, Fredrick
1977   "User Aspects of an Automatic Aid to Translation as Employed in
            A Large Translation Service," In Overcoming the Language Barrier,
            by the Commission of the European Communities, pp 243-257.

Lippman, Erhard O.
1971   "An Approach to Computer Aided Translation," in IEEE Transactions
            on Engineering Writing and Speech, Vol. 14, No. 1, pp 10-33.

Lippman, Erhard O.
1975   "On-Line Generation of Terminological Digests in Language Trans-
            lation," in IEEE Transactions on Professional Communications,
            Vol. PC-18, No. 4, pp 309-318.

Lippman, Erhard O., and Plath, W.J.
1970   "Time Sharing and Computer Aided Translation," in The Finite
            String, Vol. 7, No. 8, (microfiche).

Loh, Shiu-Chang
1976   "Translation of Three Chinese Scientific Texts into English by
            Computer," Association of Literary and Linguistic Computing
            Bulletin, Vol. 4, No. 2, pp 104-106.

Loh, S.C., and Kong, L.
1977.   "Computer Translation of Chinese Scientific Journals," in Overcoming
            the Language Barrier, in Commission of the European Communities,
            pp 631-646.
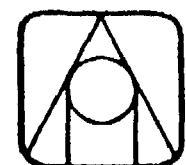
Luther, D.A., Montgomery, C., and Case, R.
1977   "An Interactive Text-Editing System in Support of Russian Trans-
          lation by Machine," in IFIPS National Computer Conference
          Proceedings, pp 789-790.

Lyttle, E.G., et. al.
1977   "Junction Grammar as a Base for Natural Language Processing," in
          American Journal of Computational Linguistics, 1975, No. 3,
          (microfiche).

Mathias, Jim
1973   "The Chinese-English Translation Assistance Group and Its
          Computerized Glossary Project," in Federal Linguist, Vol. 5.,
          Nos. 3-4, pp 7-13.

New Scientist
1977   "Many Hands Make Chinese Translator Work" in The New Scientist,
          Vol. 76, No. 1073, p 88.

Price, James
1970   "Abstract of the Development of a Theoretical Basis for Machine
          Aids for Translation from Hebrew to English," in Hebrew Computational
          Linguistics Bulletin, Vol 2., 65-83.

Schmidt, R. and Vollnhals, O.
1974   "The Use of the Lexicographical Branch of a Data Bank System
          to Produce a Phraseological Technical Glossary," in Machine
          Assisted Translation in West Germany, JPRS document 69726.

Schulz, J.
1971   "Le Systems TEAM, une Aide a la Traduction," in Meta: Journal of
          Translator, Vol. 16, Nos. 1-2. (in French).

Schulz, Joachim
1974   "Lexicography with TEAM -- Automatic Dictionary Composition,"
          in Machine Assisted Translation in West Germany, JPRS document
          68726, pp 23-34.

Shaffer, Richard A.
1978   "California Firm to Unveil a Computer that Processes Words for
          Translators," in The Wall Street Journal, 24 October 1978.

Sinaiko, H.W.
1971   "Translation by Computer." in Science, Vol. 174, pp 1182-1184.
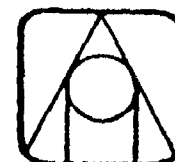
Smith, Raoul
1978   "Computational Bilingual Lexicography: A La Recherche du mot
            Juste," paper read at Foreign Broadcast Information Service
            Seminar on Computer Support to Translation.

Stallings, W.
1975   "The Morphology of Chinese Character: A Survey of Models and
            Applications," in Computer and the Humanities, Vol. 9, pp 13-
            24.

Walker, Gorden, Kuno, Susumu, Smith, Barbara, Hold, Roland
1968   "Chinese Mathematical Text Analysis," in IEEE Transactions
            on Engineering Writing and Speech, Vol, 11, No. 2, pp 118-
            128.

Warotamasikkhadit, U., Kanchanawan, N., and Londe, D.
(no date) "The Design and Construction of a System to Transliterate Thai
            by Computer," in 6th Australian Computer Conference Proceedings,
            pp 833-839.

Weaver, W.
1955   "Translation," in Machine Translation of Languages, W.N. Locke
            and A.D. Booth, eds., Technology Press of MIT and John Wiley
            and Sons: New York.

Weber, Heintz Josef
1976   "Automatiche Lemmatiseirung -- Zielsetzung und Arbeitsweisceines
            Linguistischen Identifikationsverfahrens," in Linguistische
            Berichte, Vol. 44, pp 30-47 (in German).

Wilks, Yorick
1973   "An Artificial Intelligence Approach to Machine Translation,"
            in Computer Models of Thought and Language, Roger Schank and
            Kenneth Colby, eds., W.N. Freeman and Co.: San Francisco,
            pp 114-115.

Unknown
1976   "The Lexicography Information System (LEXIS) of the Bundeswher
            Language Service," in Machine Assisted Translation in West
            Germany, NTIS Document JPRS 68726.

Young, Mary E.
1978   "Machine Translation (A Bibliography with Abstracts)," available
            from National Technical Information Service, NITS document
            PS-78/0448.