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CAMBRIDGE LANGUAGE RESEARCH UNIT (CLRU)

The CLRU came into formal existence in 1956 to deal with basic problems of the working of language and the application to machine translation of any progress that could be made on them. Since then CLRU's interests have broadened considerably, so it is appropriate to look afresh at the field with which CLRU concerns itself.

CLRU has had six main fields of corporate interest, though individual members of it have from time to time pursued further lines of research:

1. Semantic thesauri interpreted as a product of lattices that could be operated upon with Peek-a-Boo techniques.
2. Construction and operation of a machine-handleable Interlingua with about 50 primitive semantic elements, which could also be interpreted as a set of information retrieval descriptors.
3. Automatic multiple classification (Clumps).
4. Automatic segmentation of written text into "phrasings," thus permitting phrasing-by-phrasing syntactic analyses and also phrasing-by-phrasing machine translation.
5. Studies of algebraic hierarchies within Brouwer free choice systems, including digital and analog simulations (partly in collaboration with Gordon Pask).
6. Computer science; in particular the development of multiaccess systems, especially on small machines; and the development of on-line systems useful for the understanding of natural language.

As can be seen from the above, almost everything CLRU does is concerned with information processing in a very broad sense (for example, there is little work done that could not appropriately be reported at the periodic Congress of the International Federation for Information Processing), though this itself is far too wide a statement. Work has extended from syntax and semantics of natural languages into the cognate area of information retrieval, which in its turn has led to comparatively abstract work on classification theory, without any of the original lines being lost. Concurrently the necessity to have convenient means of carrying out the computations of language data-processing has led to research programming languages and notations, and further development in the field of on-line computer operating systems. The emphasis here is on special-purpose multiaccess on-line systems using small machines with large disks, with a view to making dictionary and thesaurus information readily accessible to those who want it in an economical manner.

Over the years, then, CLRU has developed skills in a wide range of subjects, all of which are of considerable difficulty, and which are of continuing interest to a great many other research workers. The most general statement that can be made is that all the work has taken its stimulus from the desire to perform definite (i.e., mechanizable) operations on material derived from systems that have some or all of the properties of natural language. The relevant problems are those of scale, complexity, and variability. The need to handle large quantities of text led directly to the interest in computing.

The complexity and variability of natural language material has led to the interest in developing a simplified basic picture of language rather than to detailed forays into examining diversified languages, and to finding ways of describing and encoding the syntactic and semantic classification, both by human and automatic means. The need to be able to perform operation on texts economically has led to studies

of simplified methods of text segmentation, to avoid the complexities inherent in textual analysis programs as previously conceived.

Accordingly, the field of action of the CLRU is different both from academic linguistics, to which questions of practical feasibility are largely irrelevant, and from computer science, which is concerned with advancing the art of computation without particular reference to any special class of computer usage. In spite of its evident centrality and importance to all mechanized data processing that requires analysis of natural language, there is as yet no convenient word or phrase in general currency that satisfactorily sums up the field in question; the intention of this contribution is to delineate it discursively.

Workpaper List

The CLRU workpaper list provides a naturally developing, informal, but also authentic record of what might be called the “flow of ideas” characteristic of CLRU.

For this reason, it has been printed in its entirety, without emendations (other than the substitution of full names for initials); and without “tidying up.” Where two authors writing two papers in collaboration have reversed the order of their two names, for example, we have left the reversal, since it probably means that the author whose name is placed first wrote most of the paper. Where, for inscrutable reasons, there are gaps in the numbering, we have left these gaps also; so that the numbers opposite to the titles in this list physically correspond to sets of artifacts stored in CLRU boxes.

On the whole the workpapers—contrasting in this respect with the lists of formal publications that follow them—deal with work actually developed in CLRU; they do not comment on authors or theories. They are thus valuable as a record of the thinking that occurred, even when their expository style or critical standard leaves something to be desired.

<i>Author</i>	<i>Title of Paper</i>	<i>Number</i>
Margaret Masterman	The Potentialities of a Mechanical Thesaurus.	1
A. F. Parker-Rhodes	Appendix to No. 1. Application of the Lattice Syntax-Programme to the Translation of the Italian Paragraph, Showing in Detail Its Transformation from Output I to Output II.	2
M. A. K. Halliday	The Linguistic Basis of the Thesaurus-Type Mechanical Dictionary and Its Application to English Preposition Classification.	3
CLRU	Annexe 5. An Account of the Pilot Project of the CLRU (Chinese Sentence).	4
R. H. Richens	A General Programme for Mechanical Translation between Any Two Languages via an Algebraic Interlingua,	5

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A. F. Parker-Rhodes	Computer Operations Required for Mechanical Translation (not issued as a Workpaper).	9
CLRU	The Mechanical Study of Context: The Mechanical Composition of Lecture-Style Discourse.	10
R. H. Thouless	The Mechanical Study of Context (Paragraph Using the Roget Head "Wonder").	11
R. H. Thouless	Note on Works Similar in Type to Roget's Thesaurus.	12
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M. A. K. Halliday	Linguistic Problems of Machine Translation: Research Report.	14
R. H. Richens	The Thirteen Steps.	15
A. R. Penny	Work on the Mechanical Study of Context.	16
R. H. Thouless and A. F. Parker-Rhodes	Mechanism of Parody (not duplicated).	17
R. M. Needham and K. I. B. Sparck-Jones	A Note on Some Further Work on Parody, Progression of Thought and Similar Topics.	18
Flynn Woolner-Bird and A. R. Penny	Comparative Analysis of a Passage from White's "Natural History of Selborne."	19
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Timothy Joyce	The Problems of Information Retrieval.	23
Margaret Masterman	Outline of a Theory of Language.	24
CLRU	Progress Report: January-August, 1957 (NSF).	25
F. Woolner-Bird and J. K. Pulling	Further Experiments in Constructing Paragraphs from Thesaurus Heads.	26
CLRU	Description of Current Work in Syntax at the CLRU.	27
R. M. Needham	Description of the Thesaurus Approach to Retrieval Problems and the Pilot Project.	28

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CLRU	"Agricola Incurvo Terram Dimovit Aratro" (first version).	33
A. H. J. Miller	Notes on the Testing of the CLRU Library Retrieval System (200 items).	34
R. M. Needham	Note on Methods of Encoding Non-Boolean Lattices for Computing.	35
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