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XX. MECHANICAL TRANSLATION*

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RESEARCH OBJECTIVES

The primary objective of our research program is to find out how languages can be translated by machine. Secondary objectives are concerned with evaluating the fidelity that can be achieved with different approaches to mechanical translation, the usefulness of the translations for various purposes, and their costs. A further objective is to add to the general knowledge of noncomputational uses of digital computing machinery and to a basic understanding of human communication.

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A. STATUS OF RESEARCH

This group has always stressed a basic, long-range approach to the problems of mechanical translation. We are placing emphasis on completeness, when completeness is possible, and on finding out how to do a complete job if one is not now possible. We are not looking for short-cut methods that might yield partially adequate translations at an early date — an important goal that is being pursued by other groups. We are seeking definitive solutions that will be permanent advances in the field rather than ad hoc or temporary solutions that may eventually have to be discarded because they are not compatible with improved systems.

At the present time, our work can be considered under four headings: syntax, semantics, tactics, and technique.

During the past year we have worked on a number of topics connected with syntax. They included work on negation, on the formal properties of grammars, on depth considerations in grammar, and continued work on grammar programs for English, French, and German. These programs should eventually grow into the fairly complete syntactic descriptions that we need. Work has also been started on Arabic.

The area of semantics is at least as important as the area of syntax, but it has been comparatively neglected by linguists. Over the past year our work has shown that significant advances can be made by a bold attack on some of the difficult semantic problems.

In the area of tactics, we have advanced with our continuing work on recognition routines and on generative routines. We have also been concerned with the tactical

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matters of how best to organize a mechanical translation routine and how best to organize a dictionary. A number of computer programs have been written and will be run during the coming year. Also, in the field of tactics, we are working on recognition of phrases and sentences written in a highly stylized version of English.

In the field of technique, work has proceeded on COMIT, an automatic programming system designed for use in mechanical translation and language-processing research. The system became available for limited use last June, and was, in fact, used briefly. Further use of COMIT was set back when the M. I. T. Computation Center replaced the IBM 704 computer, for which COMIT had been programmed, by an IBM 709 computer. The required conversion of COMIT to the 709 computer is nearly complete. It is expected that versions for both computers will be released soon, together with adequate documentation, so that COMIT can be used by other groups. It is estimated that with the use of COMIT for certain types of programs, the amount of time required to write the program is reduced to at least one-tenth of the time required to write the program directly in machine language. The documentation will include a programming course, a programmers reference manual, an operators manual, a program description, and a complete set of flow-charts and specifications. Also, in the field of technique, we have begun the key-punching of German-English parallel texts for use with our text-search programs.

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