

[Memorandum from W.F.Loomis to Warren Weaver]  
[Reproduced with permission of the Rockefeller Foundation Archives]

FROM: WFL

DATE: January 18, 1951

TO: WW

COMMENTS:

**SUBJECT:** Mechanical Translation

On November 30, 1950, WFL sent out a letter of inquiry on the subject of Mechanical Translation to various men in the field. Their answers are now in, and the following is WFL's attempt at summarizing the present status of this problem as it is being tackled in both Europe and America.

I. Men who are actually doing something, roughly in order of their activity.

1. Harry D. Huskey, Assistant Director, National Bureau of Standards  
Institute for Numerical Analysis, U.C.L.A., California.

Huskey writes that he is interested in running pilot tests concerning MT on their SWAC. This machine has an internal memory of 256 words at present, which is being enlarged to 8,000 with a magnetic drum and even 100,000 with a magnetic tape unit. SWAC was not designed for non-numerical work, but Huskey feels that it will be useful for preliminary testing. He writes that formal work on this project stopped last September as they ran out of money. He has sparked both the Departments of Spanish and German at U.C.L.A. into making some paper and pencil studies of vocabulary ratios and syntax translation problems.

The former studies on vocabulary ratios are being made by William E. Bull of the Department of Spanish, who has subsequently submitted a \$2,000 request for a project to cover a full-time research assistant for eight months to complete the analysis.

Victor A. Oswald, Jr., of the Department of German, has sent us a manuscript entitled "Proposals for the Mechanical Resolution of German Syntax Patterns," which indicates that syntax problems can be solved by using a numerical code to identify syntax functions and by employing mechanical routines resolving foreign syntax patterns into English ones.

J. D. Williams has written us that Huskey is particularly interested in the hardware aspects of MT and is looking for jobs for his SWAC. He states that the above groups are starving and almost limited by the supply of paper and pencil.

2. Dr. A. D. Booth, Birkbeck College, London.

Booth writes that he is primarily interested at present in codifying words so as to utilize memory space most advantageously.

Donald MacKay writes that Booth hopes to mechanize a dictionary by electronic means.

3. Dr. R. H. Richens, Institute of Agricultural Genetics, Cambridge, England.

Booth writes that Richens' approach deals mainly with dictionary translation plus explanation which enables account to be taken of word endings in accordance with standard grammar also contained in the dictionary. He says that Richens is the most notable worker in MT in England.

Calvin Mooers of the Zator Company writes that when he was recently in England he was told by Mr. R. A. Fairthorn of the Royal Aircraft Establishment, Farnborough, Hampshire, England, that Dr. Richens had actually operated a tabulating machine to do translation by printing the multiple equivalents.

4. J. D. Williams, Rand Corporation

Williams writes that before tackling any hardware experiments they decided to survey the field in a series of small studies. The first of these was entitled "An Experimental Study of Ambiguity and Context," by Abraham Kaplan, which they sent to us. At present they have no money for this work, as they feel such funds cannot rightly come from the Government but must come from an outside agency.

II. Men who are not working in MT directly, but are interested in it.

1. Calvin N. Mooers, Zator Company, Boston.

Mooers writes that he and his company are not working on MT, but on a related field, that of "information retrieval," which is the job of finding filed material when desired. Thus, he hopes to perfect a Mechanical Secretary.

2. J. B. Wiesner, Massachusetts Institute of Technology

Wiesner writes that various people at M.I.T. are interested in MT, although he knows of no specific work going on.

3. Claude Shannon

Shannon writes that the Bell Laboratories so far have only talked about MT, but have not done anything yet.

4. Donald MacKay, King's College, University of London.

MacKay writes that his own interest is as yet only on the level of information theory in general.

5. Gabor, Imperial College, London

J. B. Wiesner suggests that Gabor could supply us with the names of people in England who are interested in MT.

6. Dr. D. B. Fry, Department of Phonetics, University College, London.

MacKay writes that Fry is working on problems of speech recognition and is interested in the subject on a long-term view.

7. Dr. G. Timms, 114 Lime Grove, Eastcote, Ruislip, Middlesex, England

MacKay writes that Timms is actively interested in Shannon's work.

SUMMARY:

Some active work is presently going on in MT, namely, the groups of Huskey and Williams in California, as well as the Booth and Richens efforts in England. Both of them seem to agree that the first problem to tackle is the electronic mechanization of a dictionary to be handled apparently by a machine that prints multiple equivalents under the word to be translated. The problem of word order in a sentence (syntax) has at least been approached numerically in Oswald's paper from U.C.L.A. The two American groups at least are suffering from lack of support, as apparently the subject of MT is too far afield for the budget departments of both the National Bureau of Standards and the Rand Corporation.

If any support is to be placed in this field, it would seem to WFL that the first step might be a meeting of the above men in order that they might acquaint each other with what they are doing. Such a meeting could properly be held in London. Perhaps a second meeting two years later could be held in Los Angeles. Small grants to Huskey's group (to include Bull and Oswald) as well as perhaps to J. D. Williams, should be considered in addition.