Electronic Brain Translates Russian
An electronic language translator may have the
power to revolutionize intercultural communication . . .
Russian scientific works are being translated to English

AN ENORMOUS STEP has been taken toward establishing intercultural communication. A mathematical computer, IBM 701, of International Business Machines Corp. has been converted into an electronic language translator, called the electronic brain. The brain's first language feat has been in translating Russian scientific literature, chemistry and engineering included, into English. A typist who doesn't have the know-how in any language can work the machine.

The electronic brain is just in experimental stages regarding language translations. However, during its trial run, IBM 701 translated Russian sentences at the rate of one full sentence every six or seven seconds. Impact on civilization would be tremendous if, in time, the machine could translate basic references and scientific literature in existence in Western languages. This is not the brain's only objective, however. In the words of Leon Dostert, Georgetown language scholar who originated the practical approach to the idea of electronic translation. "The value to research of having current literature in scientific fields readily and promptly available in various idioms is another practical objective."

Unfortunately for the brain, although it performs feats of genius, it just can't think for itself. So Georgetown linguists created an entirely new electronic language. They took normal words and attached to them tags or signs which give each word a precision it does not usually possess. These signs denote rules of grammar and meaning.

Six rules were used in the experimental run with the brain and these six were enough to cover all the words in approximately sixty sentences that the 701 was asked to translate. Dostert estimates that it may take as many as one hundred rule-tags to translate scientific and technical literature in general.

These six tags govern transposition of words where that is required in order to make sense, choice of meanings where a word has more than one interpretation, omission of words that are not required for a correct translation, and insertion of words that are required to make sense.

In preparing IBM computer to perform, 250 Russian words and their equivalents in English were written electronically in plus and minus charges on a magnetic drum surface. The instructions were stored on the faces of cathode ray tubes in the 701's electrostatic brain. All that remained was to give the computer the Russian words to translate.

Scientific and technical subjects had a lucky break in being the brain's first

Specimen punch card and below a strip with translation, printed within a few seconds from electronic translator
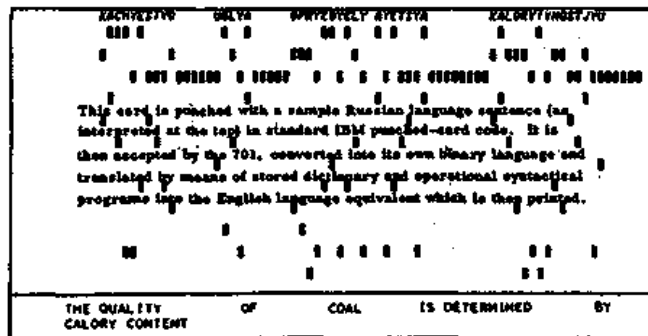
guinea pig but this isn't the only type of translation the brain should be able to do. However, it's one of the easiest. Scientific and technical subjects were first source because that type of writing is done with words having highly specialized meanings. If a word appears in a certain context, chances of its having a certain meaning are extremely high and so Brain doesn't have

to study his "Thesaurus" to see which meaning is most applicable in a particular sentence.

The feasibility of machine translating was demonstrated over a year ago by James W. Perry, then of Massachusetts Institute of Technology (I&EC, Dec. 1952, page 11A). Perry showed that use of an electronic brain was feasible by setting up pseudo machine conditions. Russian sentences containing scientific text were broken down into individual words, each word being copied on a separate piece of paper. The papers were shuffled purposely to put the individual words out of context. A writer took the words at random and supplied separate English translations for each word. The words were then put back in text or restored to the original Russian order.

Although the resulting translation paid little heed to occasional word omission or A-l grammar, even scientists with scant knowledge of the particular subject on hand could make sense out of the somewhat jumbled English translation. The simple experimental conditions of Perry's were the conditions that would have to be superimposed on an electronic brain.

Thomas J. Watson, board chairman of International Business Machines Corp., holds continuous sheet of English-worded sentences from printing mechanism of the "brain"