Russian Translated Into English
by Electronic Computer in a Few Seconds

Russian was translated into English by an electronic data-processing machine for the first time recently.

Brief statements about politics, law, mathematics, chemistry, metallurgy, communications, and military affairs were submitted in Russian by linguists of the Georgetown University Institute of Languages and Linguistics to the 70? computer of the International Business Machines (IBM) Corporation, and the giant computer, within a few seconds, turned the sentences into easily readable English.

More than 60 Russian sentences were given to the computer altogether. All were translated smoothly in a demonstration performed jointly by Georgetown and IBM as a phase of IBM's endowed research in computation.

"The potential value of this experiment for the national interest in defense or in peace is readily seen," Professor Leon Dostert, Georgetown language scholar who originated the practical approach to the idea of electronic translation, declared to the group of scientists and U. S. government officials who witnessed the demonstration.

"Those in charge of this experiment now consider it to be definitely established that meaning conversion through electronic language translation is feasible."

Although he emphasized that it is not yet possible "to insert a Russian book at one end and come out with an English book at the other," Dr. Dostert predicted that "5, perhaps 3, years hence, interlingual meaning conversion by electronic process in important functional areas of several languages may well be an accomplished fact."

What the electronic translators have done actually is to create an entirely new electronic language. They have taken normal words and attached to them tags or signs which give each word a precision it does not usually possess. These signs actually denote rules of grammar and meaning. Although only six rules were used in the demonstration, the six were enough to cover all the words in all the sentences the 701 was asked to translate.

The IBM computer could translate only because these rule-tags were hitched onto normal words, it only can perform tasks in obedience to detailed instructions prepared by human minds.

The six rule-tags were the solution. Those particular six were chosen because they have a broader effect on language translation than any other rules studied by the Georgetown linguists. Dr. Dostert estimates that it may take as many as 100 rule-tags to translate scientific and technical literature in general. But, no matter how large the number becomes the six will remain basic.
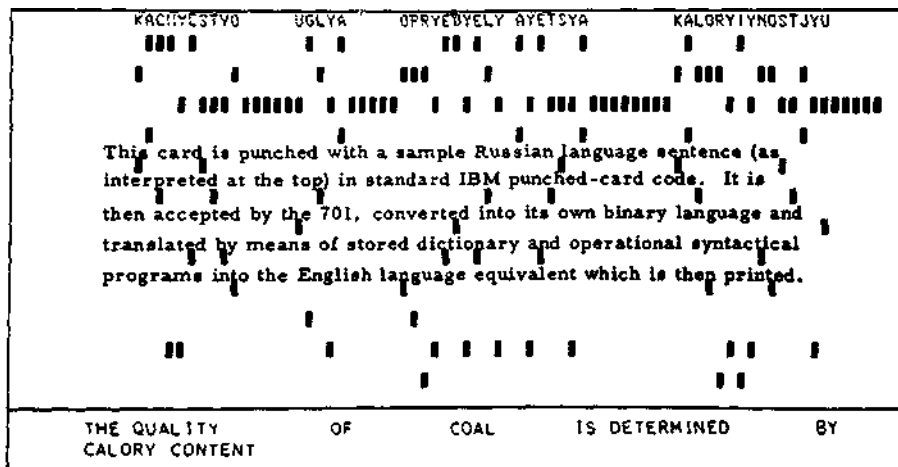
Specimen punched card and below a strip with translation, printed within a few seconds

The six rules 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.

After the six rules were formulated as the foundation of electronic translation, the linguists tried them out on themselves. First they wrote out sentences in Russian. Then they wrote out instructions as to how the rule-signs could be placed in the Russian-English glossary to lead to the proper English translation. After that, they gave the Russian sentences and the instructions to government officials and others in Washington who knew nothing about Russian or electronic computers. The officials followed the instructions and came up with the right translations.

The first step in preparing IBM's computer to repeat this human performance of a mechanical task was to write electronically, in plus and minus charges on a magnetic drum surface, 250 Russian words and their equivalents in English. Wherever a Russian word had more than one meaning, each meaning was given a rule-sign. This set of electronic words then constituted the dictionary to which the computer could refer.

The second step in preparing the 701 to translate was to store the detailed instructions-exactly like those the people in Washington had followed, except that these were written in electric charges on the faces of cathode-ray tubes in the 701's electrostatic memory.

All that remained to be done after that was to give the computer the Russian words to translate. The computer responded at the rate of one full sentence every 6 or 7 seconds.

What the 701 actually did, in executing the Russian-English translation, was to create within itself a working model of another computer specially designed to handle logic instead of mathematics.