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Russian is turned into English by a fast electronic translator

by Robert K.Plumb

A public demonstration of what is believed to be the first successful use of a machine to translate meaningful texts from one language to another took place here yesterday afternoon.

This may be the cumulation of centuries of search by scholars for "a mechanical translator." So far the system has a vocabulary of only 250 words. But there are no foreseeable limits to the number of words that the device can store or the number of languages it can be directed to translate.

Scholars and scientists who worked on it believe that within a few years the system may greatly increase communication, particularly in technical subjects, by making translation quick, accurate and easy.

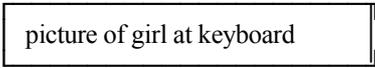
The demonstration was at the headquarters of the International Business Machines Corporation, 590 Madison Avenue. It is the result of cooperative research by scientists of the corporation and scholars of the Georgetown University Institute of Languages and Linguistics in Washington.

The "mechanical" part of the translation system, which is mostly electronic, is a standard commercial model of the largest International Business Machines "stock" computer. This device, called the IBM Type 701 Electronic Data Processing Machine, was put on the market last April. Since then twelve of the machines have been sold to commercial, military and university computation laboratories.

The "literary" part of the system is a mechanical model of language devised at Georgetown by Prof.Leon Dostert and Dr.Paul Garvin. The corporation's share in the project was conducted by Dr.Cuthbert C.Hurd, director of its Division of Applied Science.

In the demonstration, a girl operator typed out on a keyboard the following Russian text in English characters: "Mi pyeryedayem mislyi posryedstvom ryechi." The machine printed a translation almost simultaneously: "We transmit thoughts by means of speech." The operator did not know Russian. Again she types out the meaningless (to her) Russian words: "Vyelyichyina uglu opryedyelyayatsya otnoshyenyiyem dlyini dugi k radyiusu." And the machine translated it as: "Magnitude of angle is determined by the relation of length of arc to radius."

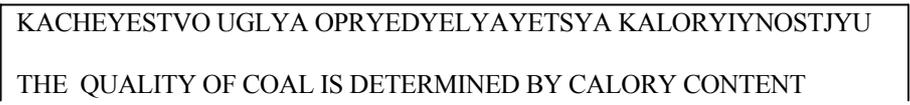
Calculator takes on a new job: Language translation.



picture of girl at keyboard

[caption] An electronic calculator produced by the International Business Machines Corporation was demonstrated yesterday in a new role: translating Russian phrases into English. The device has a "vocabulary" of 250 Russian words and can be adapted to other languages. Miss Marilyn Polle "types" Russian phrases on I.B.M. punch cards that are fed into the machine.

[photograph of punched card]



KACHEYESTVO UGLYA OPRYEDYELYAYETSYA KALORYIYNOSTJYU
THE QUALITY OF COAL IS DETERMINED BY CALORY CONTENT

[caption] Above, specimen punch card and below a strip with translation, typed almost simultaneously

Given by language code.

Several short messages, within the 250-word range of the device, were tried. Included were brief statements in Russian about politics, law, mathematics, chemistry, metallurgy, communications and military affairs. The sentences were turned into good English without human intervention.

The heart of the system is the mechanical model of language devised at Georgetown. There the scholars first assembled a 250-word vocabulary in Russian covering the seven broad fields. Then they determined the rules of syntax required for a meaningful statement and reduced them to six instructions for the data-processing calculator.

These instructions are introduced into the calculator's short-term electrostatic "memory" with punch cards. The cards tell the machine how to cope with syntax.

In translating, for instance, a word "A" which precedes a word "B" in Russian, may be reversed in some cases in English. Each of the 250 words is coded for this inversion. Sometimes words must be inserted in the English text, sometimes they must be omitted, following code instructions.

When there are several possible English meanings for a Russian word, the instructions tell the machine to pick out the meaning that best fits the context.

Foreign words are typed on a keyboard that punches I.B.M. cards. These are fed into the calculator, where they encounter the vocabulary, also punched on cards. On a standard printer meaningful English texts emerge.

According to Dr.Hurd, the calculator is a general-purpose data processing machine not designed specifically for translating. Nevertheless, it has a memory capable of storing roughly 1,000,000 five-letter words. There are 600,000 entries in the latest Webster's unabridged New International Dictionary.

Dr.Hurd said that the corporation would now design a machine particularly fit for translating rather than for general computing utility. Such a device should be ready within three to five years, when the Georgetown scholars believe they can complete the "literary" end of the system.

Dr.Dostert and Dr.Garvin said they chose Russian for their first experiments because it was a difficult language and a system that could translate it could handle anything.

The machine will not accept incoherent statements, Dr.Dostert said. If they are introduced for "translation" the machine balks, and rings a bell. And it will ring a bell when it encounters a misprint. It now prints eighty letters in two seconds.

As soon as cards for Russian are completed, sets will be made for German and French. Then other Slavic, Germanic and Romance languages can be set up at will.