TECHNICAL TRANSLATING*

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This paper concerns the translation of scientific and technical literature (exclusive of patent translation, which follows special rules), and the translation of Russian chemical literature in particular, into American English. However, the principles laid down apply equally to translation into other languages.

Scientific translation is a form of creative writing. It is not merely a mechanical substitution of an English word or idiom for each foreign one, but instead consists of expressing the intent of the original as clearly and accurately as possible, consistent with good English style and grammar. The ideal of translation should be to express the meaning as the author would have expressed it if he were writing in English and knew the language as we do. A good translation should sound almost as if it were the original. How freely one dares to translate naturally depends much on the requirements of one's client, but a strictly literal translation is usually undesirable since it is awkward and often confusing. Therefore being able to read and understand a passage of foreign literature is only half the battle; the hardest part is often to render this into idiomatic English with no loss of meaning. Every sentence must be complete and make sense. One should not hesitate to rearrange the elements of a sentence, or break a very long sentence into several. This requires of the translator a certain facility of expression in English, and for this reason translators educated in the United States or well trained in English elsewhere have a distinct advantage.

An important part of scientific translation is rendering technical terms precisely; for scientific writing is nothing if not precise. The ideal here is to conform to good current American usage, which in chemistry generally means the usage of the ACS journals. A too literal rendering of a technical term is often quite inaccurate. For example, in the field of rubber the Russian term with a literal meaning of "shovel sample" corresponds to what Americans know as a "dumbbell specimen"; "closed mixer" refers to what we call a "banbury"; "resistance to rupture" means "tensile strength," and so on. Most such terms if rendered literally would be simply meaningless to someone working in this field, but the last of these would be worse still, since "resistance to rupture" might be confused with "tear resistance." It will be noted that the most troublesome terms are those of two fairly common words which, combined, give a special meaning, e.g. "fallout." In other languages, as in English, a common word borrowed as a technical term may have different meanings in different sciences, besides which the different meanings often correspond to different English words. Thus the Russian word for "pointer" may also mean "index" in physics, "indicator" in chemistry, or the "needle" of a dial.

Fortunately many technical terms can be rendered fairly literally, however, and many of the words are cognate to English words in most languages. Thus one easily recognizes the Russian terms "atom," "apparat," "temperara," "kreking" ("cracking") and so on. Organic nomenclature is transferred easily from one language to another by changing the endings and making other minor alterations, but this nomenclature always should be brought into conformity with good American usage (usually ACS usage). Thus "divinil" easily comes through as "divinyl" but must be changed to "1,3-butadiene," the equivalent of "steroid-17-ketone" to "17-keto-steroid," and so on. Nomenclature of inorganic compounds in some languages is not so easily converted; in Russian the anion comes first, as in "khloristyi kal'tsii" (calcium chloride). Also in Russian the high and low metal valences are often indicated in the word for the anion; thus "okis'" means oxide, but more specifically the oxide of the higher valence, as ferric oxide, and "zakis'" the low-valence oxide. In almost any language, however, the translator has the advantage that the names of all elements except the common ones are familiar; thus the Russian "plutonii," "alyuminii," "kadmii" and "germanii," once transliterated, are recognized easily as plutonium, aluminum, cadmium and germanium. Many American trade names are used uncapitalized as common nouns in Russian, e.g., "neopren," "pleksiglas."

It should be noted that chemical and mathematical formulae in most languages are virtually identical to those in English. The symbols for the elements are given in Roman letters in Russian texts. Other abbreviations, symbols and notations should be changed to standard American forms.

A good bilingual technical dictionary is a virtual necessity for a translator. By far the outstanding Russian-English dictionary is Callaham, "Russian-English Technical and Chemical Dictionary," published New York, N.Y., 1956. A very valuable help for a beginning translator is Perry's "Scientific Russian." Among the many special dictionaries, one might mention the Russian-English glossaries of nuclear physics and other fields of physics published by Consultants Bureau. For chemical German the

*Presented before the Division of Chemical Literature, ACS Chicago Meeting, September 10, 1958.

outstanding work is the well-known dictionary by Patterson. A comprehensive dictionary of general technology is DeVries, "German-English Technical and Engineering Dictionary," published New York, N. Y., 1950. Much industrial terminology is found in Lenk and Börner, "Technisches Fachwörterbuch der Grundstoff-Industrien," Vol. II, published Gottingen, 1954. A special botanical section is found in Webel, "German-English Dictionary of Technical, Scientific and General Terms," 1952.

Some terms and abbreviations not found in any dictionary (and there are many) may have to be "puzzled out" by analogy to other known words or from the context. Often the meaning of a certain word as used in the early part of a paper may be unclear, but be explained by what comes later. A translator should not spend overmuch time puzzling over one obscure term, but mark it with a question mark and continue. In one Russian article the trade name "P Extra N" was used repeatedly in the text in describing an accelerator which was identified in the legend of a figure as zinc ethylphenyldithiocarbamate. It might be well to jot down in a dictionary for future use any terms decoded in this manner; in a later article, as it happened, the trade name was used alone. One should, naturally, insert the chemical composition in parentheses after the trade name if it is known.

Translators should understand at least vaguely the subject matter of the material being translated, and it would be ideal to translate only literature in their special field. Since this is unlikely, however, it may be necessary when translating literature in a strange field to consult reference works in the field, in order to get some idea of the present state of its technology and to verify the technical terms used. It may be helpful to refer back to any available literature cited in the bibliography, or to abstracts on the subject in Chemical Abstracts. Unfamiliar laboratory apparatus mentioned in the text often can be found in catalogs of scientific supply houses. In one case it was necessary to consult Thomas' "Register of American Manufacturers" to find the American name for a certain piece of industrial equipment described in a text. One skilled in the use of a technical library usually can track down an obscure term fairly quickly. A translator who works regularly in industrial research or development may find around him many people whose expert knowledge in certain fields, gained from former employment or special training, makes them valuable to him as consultants.

What are the qualifications of a technical translator? Most people think that someone who speaks Polish and English can translate anything from Polish into English, which of course is not true. A more sophisticated view is that someone who speaks Polish and English and knows chemistry can translate chemical Polish, which again is not true. What is required of a technical translator is rather a good command of American English, a textbook knowledge of the foreign language, a good background in the general branch of science involved (as chemistry) and a knowledge of the foreign technical terms and nomenclature and their exact equivalents in English. In addition one needs a certain knack of translating, which usually comes with practice and is akin to the art of writing technical reports.

The language training of a translator of scientific Russian should start with a two-semester introductory college course in the language, followed by a semester of scientific Russian, or advanced Russian where this is not available. The translator should then strike out for himself, preferably with a scientific textbook published in that country, to build up a vocabulary, before essaying to read periodical literature. One convenient way of familiarizing oneself with the Russian literature is to become an abstractor for Chemical Abstracts, especially as copies of Russian journals are quite scarce otherwise. The translator need not bother learning to speak the language well, understand the spoken language, to write in Russian or to read literary or newspaper Russian, since these are all separate skills. He should develop only his passive vocabulary (the Russian words which he recognizes at sight), not the active one. After some time he may find that although he cannot summon up at will the Russian word for "refractive index," he immediately recognizes it at sight.

There is an increasing demand for translators of technical Russian. Competent translators are scarce, partly because there never has been a large population of Russian descent in the United States, and in part because of the difficulty of the language. The Russian language is by no means impossible, however, being somewhat harder to learn than German, but no harder to read once learned. The main sources of difficulty are the fairly complex grammar and the unfamiliar Slavic roots in common words. This is partially compensated for by a word order fairly close to that of English. Scientific Russian is far easier to translate than literary Russian because its vocabulary is quite limited in comparison with that of Tolstoy, for example. A translator working in a certain industry in which the Russian literature is especially important, such as petroleum, can make himself especially valuable by learning the special jargon of the industry in Russian.

To summarize, an ideal technical translation is not always literal, but aims to express the meaning of the original as an American author would have expressed it, with the technical terms, nomenclature and symbols carefully converted to current American equivalents. One should understand the material being translated,

but with suitable library research one "skilled in the art" can translate in unfamiliar fields of technology. After studying the foreign language a translator should develop his passive technical vocabulary in the foreign language by technical reading, to the exclusion of other language skills. Fluency of expression in the language into which he translates is especially desirable. The Russian language is recommended as a fruitful study for technical personnel.

ACS BOOKLET REVIEW

Suggestions on How to Organize, Present, and Illustrate a Technical Paper, Bulletin 8, American Chemical Society, Washington 6, D. C., 18 pp., 1961, $1.00 or $0.50 on orders of 10 or more.

Thousands of technical papers are presented before the various ACS Divisions during the two national meetings. The Society through its Divisions is thus vitally concerned that these presentations fulfill four requirements: (1) be based on technically sound work; (2) be oriented towards and organized for a listening audience; (3) be delivered concisely and clearly with emphasis on significance, not details; and (4) be illustrated with effective slides.

This short booklet is directed towards the speaker's obligation in these four requirements towards his audience, and how he may meet his obligation. The best practices known today are delineated and the principles for clear oral presentation are well covered. Reliable methods of producing effective projection slides are adequately described. The serious use of this booklet by authors will do much in making ACS meetings even more rewarding for all participants.

BOOK REVIEW

Saline Water Conversion, Advances in Chemistry Series, No. 27, American Chemical Society, Washington, D. C., 1960, 246 pp. $5.85.

This collection of 22 papers comprised the Symposium on Saline Water Conversion presented before the Division of Water and Waste Chemistry at the 137th National Meeting, April, 1960, at Cleveland, Ohio.

One of the major problems in our civilization is the winning of potable water from saline water at a reasonable cost. The problem has not been solved, nor is its solution apparent although the processes are well known which probably will achieve it. These processes are thoroughly described, discussed, and evaluated in this book, including extraction, freezing, demineralization, evaporation, distillation, osmosis, and electrodialysis. In each of these broad process areas, considerable advancements have been made, and the goal of "low cost", although still elusive, is closer as each of these processes is researched with new ideas and creative approaches.

In this advancing field of great importance to most nations, it is essential that the programs be reviewed constantly and that the technologies used be examined thoroughly. This is successfully done by this book.