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D. A. Sinclair

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THE GROWING CRISIS IN SCIENTIFIC TRANSLATION

D. A. SINCLAIR, Ottawa.

Before the second world war the majority of first-rank scientists were multilingual at least for purposes of reading in the literatures of their own subjects. In English speaking countries this meant in practice that the French taught at secondary and undergraduate levels was generally sufficient for this purpose, while as a requisite for doctoral standing candidates were expected to show a fair reading knowledge of German as well. With these three major European tongues it was felt that perhaps eighty-five per cent of the important literature in most scientific fields was open to them.

Since 1945, however, the situation has changed radically. The spectacular advances made in all branches of science during the last two decades have added enormously to the detailed content of the various branches of science and at the same time the areas of specialization have narrowed. To keep pace with these developments the volume of published material has assumed the proportions of a veritable flood, so that today the practising scientist, even when he possesses the necessary linguistic ability, finds himself barely able to keep abreast of publications in his own language and has little time for the usually slower and more laborious work of studying the foreign literature.

The universities have long been aware of the need to teach languages to science students and most of them recommend that a reading knowledge of French and German be acquired by the fourth year, but in practice this has not been easy to achieve. One of the reasons, no doubt, is that in the past the respective aims and interests of language and science departments have seemed far apart, and because there has been little time or money available to either faculty for organizing effective courses designed to meet the specific needs of science students. The problem is still further complicated today by the fact that there is no longer any easy answer to the question of what languages should be taught. German, once the unchallenged second language of science has had to give way before Russian(1), a trend that will undoubtedly be accelerated by Russia's recent spectacular achievements in rocketry and astronautics. It is interesting to note that in this connection the University of British Columbia now has courses in Russian for science students. In addition to French, German and Russian, however, important work is being published in several other languages. Specifically we may mention Italian, Spanish, Dutch, the Scandinavian languages and Japanese(2).

In any event the expectation that tomorrow's scientists will graduate with an ability to find and read all the nesessary foreign literature remains little more than a pious hope. A few of the best will continue their studies abroad and return with a knowledge of some foreign languages and their numbers will be somewhat reinforced

(1) For a succinct account of the dramatic rise of Russia from a position of scientific backwardness to one of equality with the Western powers, see A.H. Holloway and E. Pietsch, "Russian Scientific Literature", **Advisory Group on Aeronautical Research and Development Documentation Committee**, Brussels (1956) : 1—3.

(2) In this connection the following statement by J. E. Holmström, perhaps the foremost authority on these matters, will be of interest ; "In Chemistry... German was the leading language (for volume of Scientific Publications) until shortly after the 1914-18 war, when English superseded it. French at one time came second, but after the 1914-18 war it ranked only fourth, and now Japanese competes with it for fifth place. Nearly seventy years ago Russian reached fifth place among forty languages, but it is now competing with German for second place." **Research**, Vol. 7, May 1954.

by graduate scientists recruited from overseas, but the vast majority, especially in the applied sciences, will have to rely for their knowledge of what is going on in other countries on translations and abstracts in the English language.

The importance of such knowledge can hardly be overestimated. It is not merely a question of a race between nations to "get there first" with a given discovery. There is also the fact that millions of dollars may be wasted annually in the duplication of research that might be avoided by timely translations of the relevant reports.

Another reason, perhaps the most compelling of all, why the translation and distribution of foreign scientific publications should be given high priority lies in the spirit of science itself. The sharing of scientific knowledge among civilized nations is one of the brighter aspects of modern history. At the time of the Renaissance men like Erasmus, Galileo, and a little later Descartes, wrote up their reflections and discoveries in Latin, then the universal language of learned men. Later the works of Faraday, Pasteur, Darwin, Bernoulli, spread rapidly across national boundaries to every part of the world in which the natural sciences were being seriously pursued. In our own times the Einsteins, the Rutherfords, the Curies, the Pavlovs, the Bantings, to mention but a few at random, belong in a very real sense not just to the countries in which they were born or lived or did their outstanding work, but to the community of science itself, which has benefitted as a whole from their discoveries. The maintenance of this tradition is more than ever of vital importance to the peace and progress of the world, and who can doubt, in view of the complexities of modern communication, that the translator's and interpreter's arts are going to have to play an increasing role in it?

The problem of scientific translation, as of any other type, is one of preparation and distribution — how to get enough translations made and how to get them into the hands of as many people as possible who can use them. For economic reasons, perhaps, the distribution aspect is the one which has hitherto received the most attention. Obviously the translation of periodical literature for individual use only would entail prohibitive costs. To quote from a recent report : "A single copy of a scientific journal which is known to contain an article of interest can be bought for perhaps 3s., or say 40 U.S. cents. If that article is highly technical in a specialized field, a competent translation of it into another language may cost as much as £15, or well over $40.00."(3)

In order to overcome this limitation all the major English speaking countries now have machinery for pooling translation services within their own borders and with each other, so that most translations now prepared by public institutions in Great Britain, the United States, Canada, Australia, New Zealand and South Africa automatically become available to scientists throughout the English speaking world. In Canada the principal agency of this kind is the branch of the *Commonwealth Index of Scientific Translations* maintained by the Library of the National Research Council at Ottawa. These services have been constantly extended and improved, so that now, broadly speaking, no scientist need remain long in ignorance of any existing translation.

The main trouble today, therefore, is that the volume of scientific translations is still far too small. In fact this problem has suddenly acquired critical proportions. It has now become apparent that one of the reasons why Russia is forging ahead of the west so rapidly in many scientific and technological fields is that its scientists are kept abreast of the relevant literature from other countries. "It appears," states a noted American authority, "that the Russians translate on a very large scale. English and other foreign-language monographs and journals are promptly translated into Russian."(4) It is not difficult to show, either, that the neglect of foreign scientific literature can be very costly. A case has recently been cited where several American Industries had spent five years and some $200,000.00 in research on the design of certain electrical circuits. It was then discovered that the entire work had already been described in a Russian journal before the American research was started.(5) This is by no means an isolated occurrence, and in the absence of adequate translation services there is no way of knowing how often such situations may go undetected.

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(3) UNESCO, **Scientific and Technical Translating**, Paris, 1957.
(4) R. E. O'Dette, **Science**, Vol. 125, No 3248 (1957) : 579 - 585.
(5) **The New York Times**, Nov. 25, 1957.

However, it is one thing to state the problem and quite another to propose a practical solution. It is obvious that no single organization, nor indeed any one English speaking country, can solve it alone. There must be greatly increased co-operation in the drawing up of translating programs so as to avoid duplications, and already existing machinery for publications and exchange will need to be enlarged and improved to take care of a greater output. The real crux of the problem, however, remains the chronic shortage of competent translators for this type of work, and before any remedies can begin to be applied some fundamental changes of approach are needed.

In the first place there is a certain inertia to be overcome among scientists themselves, for clearly they as a group must be made to recognize the importance of translation before there is any point in training large numbers of translators for their specific needs. For instance, it is not uncommon to hear a scientist say that much time spent in the examination of foreign literature is scarcely worthwhile because everything of value will soon appear in English in any case. Others, particularly of the older generation, feel any large-scale program of translation would constitute a lamentable "spoon-feeding' of scientific personnel who, they think, should be able to do this work for themselves. The first of these attitudes is plainly unscientific and disproved by experience. The second, in the opinion of this writer, at least, is unrealistic. It s reminiscent of a day when science in general was a more leisurely, more scholarly pursuit than it has become in these hectic times. Certainly it is to be hoped that the scholarly, reflective traditions which have been so fruitful in the past can continue to be maintained in the higher branches of the pure sciences, but in the applied fields the world has now burst in upon the laboratory as never before, and the scientist is being hard-pressed for solutions not only to technological problems, but to urgent economic and social ones as well. It is not only a question of bigger and better rockets to fly to the moon or bigger and better nuclear wardheads to serve as deterrents to potential aggressors. There are millions of hungry people to be fed with better methods of agriculture; there are power shortages to be met, droughts and floods to be controlled, epidemics to be combatted and a host of other projects, too numerous to mention, to which scientific investigations are applied and are being reported on in many different languages. All this brings with it a new pressure and a new competition, reflected in ever more voluminous publications. In the face of this flood of material the scientist has little choice but to avail himself of any existing aids to information, including translations, whether or not this constitutes "spoon-feeding". For Russian publications, of course, a stepped up program of translation has now become an urgent necessity, but it should not be forgotten, in the near panic occasioned by the success of Sputniks I and II, that important work is undoubtedly being overlooked in France, Germany, Scandinavia and elsewhere because of the language barriers.

What can professional translators, who are linguists rather than scientists, contribute to the solution of this problem? Unfortunately, without some fundamental changes in attitude towards the subject matter and the authors there does not seem to be very much that they can do. A common feeling towards scientific work was well expressed in a recent issue of this Journal by B. Hunter Smeaton, who said : "Scientists — with the rarest of exceptions — are notoriously bad stylists, in any language, and to do more than produce a text that is accurate and free of foreignisms is indeed Love's Labour Lost."(6)

One may or may not agree with this opinion. The fact is that the conclusions to which it inevitably leads are anything but constructive. Indeed, it goes far towards explaining the general dissatisfaction one encounters among scientists with the past performances of translators. For it means that the translator who has "arrived", to so speak, will either disdain to engage in this type of work or, if he does consent to accept an occasional assignment, will merely "reproduce a text that is accurate and free from foreignisms" so that he can get back as quickly as possible to more congenial preoccupations. The word "accurate "here presumably means that the terms employed in the translation are supported by dictionary definitions, the translator having assumed beforehand that any obscurities he has encountered are due to the "notoriously bad" style of the scientist.

Now if the translator is really to perform his social function as an interpreter of the written word in a foreign language he must do better than this. He must seek, by consultation of all available sources, to understand his author on his own

(6) **Journal des Traducteurs**, II, 3 (July - Sept. 1957) : 86.

terms, just as he does with the esoteric products of modern literature. Only then will he be capable of rendering the true sense of the original in a way that will satisfy his reader. This surely is a condition of his profession. We would not think very highly of a medical profession in which the doctors generally refused to give adequate treatment for certain ailments which failed to interest them, or a legal profession from which it was impossible to get competent counsel for, say, criminal cases, because its practitioners regarded this kind of practice as beneath their professional dignity. Yet this is the light in which the public generally, and scientists in particular, all too often regard translators.

This is not to suggest that translators, as linguists, should abandon their humanist studies and give themselves over entirely to functional activities. On the contrary, if there is to be a hierarchical set-up of any sort undoubtedly the competent literary practitioner deserves a preeminent place in it. On the other hand, those who apply their talents conscientiously to the more "pragmatic" branches of the art also deserve a respected position in the hierarchy, and until the profession as a whole adopts an ideal of careful, correct interpretation in all its branches it will not attain that public recognition and respect that is indispensable to its health and prosperity.

As far as scientific translation in particular is concerned, there is an urgent need, analogous in some ways to the international emergency of 1939-45 during which thousands of intellectuals emerged from their normally cloistered surroundings and devoted their myriad talents patriotically to the prosecution of a war. For today the future of civilization depends in no small measure on what is accomplished in scientific laboratories, which in turn depends very considerably on intercommunication across linguistic boundaries. Under present conditions that intercommunication is seriously hampered for want of capable scientific translators.

The evidence that a crisis is in the making and that it is being widely recognized by the authorities is unmistakable. Nevertheless scientists are still in a quandary over what to do about it. On the one hand they are unwilling to see those of their colleagues who might be capable of undertaking the work spare precious hours from their laboratories and other more creative activities. On the other hand they are equally reluctant to entrust the work to linguist translators who, they fear, lack the necessary "scientific sense".

If this crisis is ever to be resolved, therefore, members of the translating profession must somehow try to meet the challenge. More translators should prepare themselves to accept work in the sciences by studying the subject matter and then devoting to it the same skill and high standards of craftmanship that they now apply in commercial, legal and some industrial fields. Once confidence in the product has been established an insistent demand will inevitably follow, and while it is not possible to foresee at this stage what forms this demand will eventually take, it appears likely that public agencies of one sort or another will be heavily committed. In other words we may expect to see more government positions open up for scientific and technical translators and more organizations formed like the Pergamon Foundation recently established in England to promote the translation and distribution of Russian scientific literature on a non-profit basis. What is certain in any case is that translators who engage successfully in this work will enjoy a double satisfaction; for, not only will they be making a significant contribution to an important human endeavour, but they will at the same time be helping to gain for their profession the public esteem and prestige which it no doubt often deserves, but all too seldom receives.