

On Translating Science

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Science is advancing so swiftly nowadays that one has to run hard in order to stand still, like Alice in Wonderland. In several of the sciences more progress has been made in the first quarter of the twentieth century than in many centuries previous. When a man, who thought he had "finished" physics or astronomy in college twenty-five years ago, takes a look in a modern textbook, he finds it is as bewildering as his native village when he returns to it after it has become a city. The familiar landmarks are lost and the faces are strange, because new streets have been laid out and his friends have grown up. In the recent rapid progress of science few of what formerly were called facts have had to be discarded, but so much has been added and the whole scheme so radically revolutionized that the new aspect is unrecognizable. The area of information added to some of the sciences in the present century is greater than their original sphere.

As investigators push forward in their several branches of science, like spokes in a wheel, they get farther and farther away from one another as well as from the common center of the community. A specialist has been defined as "one who is learning more and more about less and less." The greater the number of specialists the greater the need of a generalist. The more technical a topic becomes the more important and difficult becomes the task of translation into the vulgar tongue. Sensational discoveries in applied science have followed one another so fast of late that the public has become dazzled and indifferent. With all the multiplication of schools, libraries and all the agencies for adult education, it is questionable whether science has gained greatly in the shaping of the public mind. A recent writer in *Nature* says:

"The average 'educated' man of today knows less and cares less about the natural world in which he lives than did the 'educated' man of the Victorian era."

The fact that scientists have been compelled to construct a trade language of their own is undoubtedly one reason why they are commonly misunderstood and disesteemed. It is hard not to feel that a foreigner

who does not speak our language is not a bit stupid or crazy. Then, too, our pride comes into play and constructs a defensive mechanism for us. Our subconscious self suggests to us to say: "Well, if he can't put it into plain English I guess it does not amount to much anyway." This is the time to be reminded of an observation by Quiller-Couch:

"I hold there is no surer sign of ill-breeding than to speak, even to feel, slightly of any knowledge oneself does not happen to possess."

Translating science from technical language into the vulgar tongue is essentially the same task as translating from a foreign language into the vernacular and involves the same difficulties. No two vocabularies, whether in the same or different languages, fit exactly word for word. The aim of the translation is to express the essential idea in the new terms. In some branches of literature, for instance, the imaginative and symbolic, perfect translation is impossible. Poetry of the highest order can be only inadequately rendered in another language. The same is true of certain sciences, mathematics for instance. Any mathematical formula can be completely expressed in ordinary language but this expression would be so wordy and complicated that no mind could grasp it. The same is true of music. It would be possible to state in words the wave length and duration of every note or the position of each dot and line on a page of music, but such a description would fail to convey the vivid instantaneous impression that the musician receives when his eye strikes a sheet of music. So mathematics, like music, being expressed by a complex and technical system of symbols, cannot be put into plain language without material loss. But the results of a mathematical process can and should be translated into common speech. This point is important since all the sciences are becoming more and more mathematical so far as they can accomplish this aim.

The popularization of science does not mean falsification but its translation from technical terms into ordinary language. Popular science need not be incorrect, but has to be somewhat indefinite. It differs from the exact sciences in being inexact. Popular science may be defined as science in round numbers.

The scientific mind is set at too sharp a focus for ordinary use.

Since the object of a translation is to carry over the essential idea so that it will, so far as possible, make the same impression upon the reader in its new form as the original was designed to do, a literal translation is often a misleading version. A missionary translating the New Testament into the Eskimo language rendered the phrase "The Lamb of God" as "God's Baby Seal." This was literally a lie but essentially a true translation.

To make a true translation requires the ability to "Put yourself in his place." It is not sufficient to know what you yourself mean by what you say, you must also know what the other fellow means by what he says. It is lack of this sympathetic insight into the mind and language of another that is the cause of the main difficulty in "getting science over." The professional scientist, like the provincial patriot, is apt to pride himself on saying: "I speak no language but my own," and since the layman cannot possibly learn the technical vocabularies of all the sciences he remains for the most part unaffected by scientific thought. This also was the chief cause of the controversies and misconceptions of science prevailing in the world at large.

But I venture to say that the effort to translate pure science into the vernacular would be a useful exercise to the scientists themselves. I have spoken of mathematics as being the most difficult to put into popular language, but a French mathematician, Gergonne, said a hundred years ago, "We cannot flatter ourselves that we have completed a theory until we can explain it in a few words to a man in the street." And Tolstoy holds the same opinion for he said, "A man could explain Kant to a peasant if he understood Kant well enough."

Certain scientists seem afraid to get off their own ground. They dare not descend from the platform to the street. They cannot talk unless they hold a piece of chalk in their hand. Now chalk is essential when talking about the cretaceous formation in geology or about marble in mineralogy, but it is not necessary otherwise. Archimedes could teach a lesson in geometry and Jesus could teach a lesson in ethics by drawing on the sand.

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