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TRANSLATING ENGLISH TECHNICAL TEXTS (Parts I and II)

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The Technical Translator: the Sherlock Holmes of Translation?

Abstract

This paper deals with technical translation from a pragmatic point of view. It focuses on specific difficulties, taking as an example the translation of English texts into French.

After an introduction to technical texts, the specifics of their translation will be dealt with. Seven major difficulties associated with the translation of such texts from English into French will be tackled using an empirical approach:

1) the reader's lack of implicit knowledge,
2) the elusive micro-relationships between words,
3) the reader's inability to identify "sub-units" (parsing),
4) numbers and units,
5) terminology, and
6) the weaknesses of the original.

The paper will end with a discussion of the special status of technical translation and of the particular scope for freedom associated with it.

A wise skepticism is the first attribute of a good technical translator

1. TECHNICAL TEXTS

1.1 Closing in on a definition

This paper deals with *technical texts* in the narrow sense of the term, that is, with texts whose subject matter concerns the use of applied sciences or of the practical, mechanical or industrial arts. This corresponds to the following meaning of the word *technical* defined in the Shorter Oxford English Dictionary:

> of or pertaining to the mechanical arts and applied sciences generally[1]

The texts referred to here will include operating instructions, specifications, maintenance and safety procedures and descriptions of material.

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[1] Shorter Oxford English Dictionary, Vol. II, page 2140.

But what indeed is a technical text? Is its subject matter the only criterion with which it can be defined? Spontaneously, many people would point to the use of technical terms as one of its main characteristics. However, non-technical texts can also include technical terms and descriptions, as can be seen in the following passage from Daniel Defoe's *Life and Adventures of Robinson Crusoe**:***

> (…) I was full two and forty days making me a board for a long shelf, which I wanted in my cave; whereas, two sawyers, with their tools and a saw-pit, would have cut six of them out of the same tree in half a day.
> My case was this: it was to be a large tree which was to be cut down, because my board was to be a broad one. This tree I was three days a cutting down, and two more cutting off the bows, and reducing it to a log or piece of timber. With inexpressible hacking and hewing I reduced both sides of it into chips, till it begun to be light enough to move; then I turned it, and made one side of it smooth and flat as a board from end to end; then, turning that side downward, cut the other side, till I brought the plank to be about three inches thick, and smooth on both sides. (…)[2]

Defoe's board-making passage shows – as do entire pages of Melville's "Moby Dick" – that literary texts may very well include technical descriptions. Why do they remain literary texts, then? First of all, there is an "I", a narrative voice, a subjective entity around which the discourse is organized. Secondly, there is an author, some human being whom the reader can identify as being at the origin of the text. Thirdly, there are formal effects, such as rhythms, echoes, associations or contrasts (rather discreet in the latter example) giving the text a formal status and enabling it to impact on the emotions of the reader.

A distinctive feature of technical texts is their strictly utilitarian purpose: their sole function is to respond to a need for information or instruction generated by the reader's need to perform a technical task. Who would read operating instructions or safety procedures for fun or moral enlightenment? The readers – or, more precisely, the users – of such texts feel they have no choice but to go through them because there is no other or better means of discovering how to mount their cupboard, follow a maintenance procedure or repair their extractor fan. So, even if the technical text is generally written in specialized language and is full of terms, the latter are part of its attributes, but not its fundamental characteristics. For the purpose of this paper, I will postulate that

> A technical text is intended to give its readers information or instructions enabling them to perform a task related to the use of the applied sciences or the practical, mechanical or industrial arts.

The following discussion of technical texts will exclude the many texts that are of a hybrid nature. On the translation market, we can find texts containing technical passages, but characterized by other features as well. We can find a technical dimension in some legal texts (e.g. memoranda of understanding), novels (as above), advertisements (e.g. an advertisement for an electrical appliance), budget documents (e.g. among the items on a materials inventory) or educational material (e.g. in a science textbook). These passages may or may not be purely technical, but the mere fact that they are part of a larger text which aims at other purposes has an impact on their nature. Should a text betray the slightest rhetorical, esthetical, humorous or argumentative touch it is no longer purely practical. Hybrid technical texts may

[2] Daniel Defoe, *The Life and Adventures of Robinson Crusoe*, Penguin Classics, 1965, p. 127.

at most share the features of the purely technical texts in some parts, but have different features as well. It is thus necessary to clarify that I shall deal exclusively with the purely technical text in this paper.

1.2 The Form of Technical Texts

Technical texts aim to convey objective (quantified and qualified) information, totally devoid of any judgment or incitation, in order to help a reader perform a predefined task. Their nature makes them both a mirror and a means of access to technical reality, on which they have an immediate bearing. They must reflect this reality directly and allow their reader to have a direct effect on it. Unlike scientific writing, technical writing does not aim at providing knowledge *per se* or developing ideas in support of a theory. There is a rhetorical and an argumentative dimension in scientific papers which is nowhere to be found in technical texts. The latter have nothing to prove: you just need them and if you are reading one, it's because you cannot do without it.

A notion quite foreign to technical texts is that of authorship. Indeed, nobody ever wonders who has written them. They might just as well have spontaneously emerged from technical reality – that is, when they are properly written, because, in the worst of cases, they seem not to have been written at all. They never contain any sign of an origin or any trace of subjectivity: their tone is totally neutral and objective.

The readership of a technical text largely depends on circumstances independent of the text itself: you only read the user manual of your new jack because your car tire is flat. And you will go through it as long as it is useful, whatever its quality. Indeed, there is no need for the technical text to be entertaining, beautiful or inspiring – which might explain why so little care is sometimes taken in its drafting.

Since the only function of technical texts is to convey information, one could believe that their form bears little importance. On the contrary, because only the content is at stake and no one takes pleasure in reading them, their form must meet one very specific requirement: that of efficiency. Their form must be entirely devoted to making the content understood. This means that it must be clear, concise and as unambiguous as possible. According to Claude Bédard, the form of technical texts is essentially neutral, free from stylistic effect and marks the « degree zero » of writing (Bédard, 1986: 166-168). Their terminology content is linked to the need to eradicate all connotative dimensions of language in order to concentrate on denotation alone.

2. TECHNICAL TRANSLATION

2.1 The Translated Text

The function of the translated text, just like that of the original, is to enable the reader – or the user – to become an able agent in the relevant context. In this sense, it must meet the same criteria as the original. Its content must be accurate and to the point: it should be neutral, objective, and contain just as much information as required for the purpose, neither more nor less. Since its form has no function beyond that of conveying the message as efficiently as possible, the same formal requirements apply here for the translation as for the original: it must be concise, simple, consistent, clear and unambiguous in order to enable the reader to focus on the content alone. As Barbara Folkart puts it:

> Transparency – i.e., immediacy of access to the referent – is the only feature of the source text *qua* text that need be preserved in translation (Folkart, 1984: 230).

Therefore, like the original, the translated technical text is supposed to both give access to and reflect the extra-linguistic reality it refers to. Like the original, it has no named author and is characterized by its neutrality and objectivity. It is never beautiful, nor impressive nor funny. Its decisive characteristic is probably that it is entirely oriented towards the extra-linguistic world of the target reader. This means that the translator must be aware of all differences between the two contexts (that of the original and that of the target text) and make all necessary adjustments to make sure that the translated text refers to the target reader's sphere of action. Of course, technical reality is generally similar wherever you are, but there are sometimes differences between the two contexts, for instance concerning power sockets, safety norms or units.

For the translator, the merely functional purpose of the text and its strict orientation towards the target reader's sphere of action have certain implications: he must constantly have function and context in mind. This means that he must never allow himself to be drawn too deeply into the text, but ensure that he remains firmly anchored in reality. Technical translation is probably the type of translation that requires the translator to take the greatest distance from the text: he must constantly switch between text and reality. This has an incidence on the way of processing the content: whereas the translator of a literary or poetic text must pinpoint the formal effects to reproduce them and other translators must worry about what the author of the original meant by such and such a phrase, the technical translator must focus on the extra-linguistic context of his reader. The filter he applies when processing the text is that of its coherence with elements that are outside.

This is precisely what Barbara Folkart underlines in her paper "A thing-bound approach to the practice and teaching of technical translation":

> Technical discourse is the manifestation *par excellence* of the referential function of language. As opposed to poetic discourse, which tends to the limit of maximum opacity, the technical text is, ideally, transparent. This dichotomy has some very fundamental implications for the translation process. Since the poetic text is a linguistic object in its own right, one whose formal, phonetic and allusive structures are invested with meaning independently of any reference to the extralinguistic, the poetic translation trajectory will be from the surface to the semiotic structures and thence to the target text. In technical translation, on the other hand, the appropriate trajectory will be from source language to extralinguistic referent to target language, or even, in certain limiting cases, from referent to target language, bypassing, so to speak, the source text. Essentially, then, the process of technical translation involves apprehending the extralinguistic referents verbalized by the source text and re-verbalizing them, more or less directly (i.e. more or less independently of the source text), in the target language. (Folkart, 1984: 229-230)

This means that, more than any other translators perhaps, the technical translator is allowed to distance himself from the original text if the context gives him good reason to do so. In particular, if the text contains an illogical or inappropriate statement, or a mistake, if it is outdated or if it refers to a context which is very different from that of the source text, the translator may feel free to intervene and correct, update or adapt it.

2.2 The Translation Process

In his paper called *Positioning Translation in Technical Communication Studies*, Klaus Schubert describes the entire life cycle of a technical document. He explains that

> the translator's main activities comprise
> - receiving the source document,
> - receiving the job specifications,
> - researching information,
> - planning the workpiece,
> - translating,
> - formatting,
> - revising
> - finalizing. (Schubert, 2009: 22)

Schubert indicates that this description "lists the activities in an approximate sequential order" (Schubert, 2009: 23). Indeed, the « researching information » stage may very well be concomitant with the « translating » one.

The translating stage is worth defining more closely. For simplification purposes, the translation process is often divided into two phases: semasiology (extraction of the meaning of the source text) and onomasiology (rephrasing of the meaning in the target text), which are generally considered to take place one after the other, but are clearly interwoven. The translator alternates between them while producing his text. Each of the phases I list below must therefore be understood as a necessary iteration, but their sequence is not set in stone and varies according to the individual working method of each translator:

(semasiology)

- identify what is unclear in the source text;
- establish what needs to be clarified (some elements may be translated without being really understood);
- identify the "sub-units" (parsing);
- look for clues within the text;
- look for clues outside the text (information and terminology retrieval[3]);
- check that the translator's understanding of the text "makes sense" (internal consistency); and
- check that the translator's understanding of the text is compatible with the known elements of the extra-linguistic world (external consistency);

(onomasiology)

- establish the context in which the text will be used by the target reader and whether this has an impact on the task;
- identify the level of precision required for the target text;
- find the proper terminology in the target language or, if this proves impossible, find another way to convey the meaning;
- check that the text, as it is written, "makes sense" (internal consistency);
- check that the text, as it is written, is compatible with what is meant in the source text and – even more so – with the known elements of the extra-linguistic world (external consistency);
- check that the style is appropriate (unequivocal, clear and concise); and
- check the spelling, grammar and consistency of terminology.

[3] The translator may look for information in parallel texts, in encyclopedias, monographs, glossaries or other reference texts; he may ask an expert or, when possible, visit the installation concerned.

As can be seen here, there is quite a bit of questioning and verifying involved in the process.

2.3 The main difficulties

Like Barbara Folkart, I consider that understanding the source text is the main requirement of technical translation. She adopts a rather radical point of view in this respect:

> Given the referentiality of technical discourse, our approach is predicated on the assumption that understanding of the referent is the single most important attribute of the technical translator. (Folkart, 1984: 239)

Now, the question is: if technical translators are not specialists in the field of the text they are translating, how can they manage to understand it? I consider that the greatest prerequisite here is the ability to manage uncertainty. To deal with difficult texts, translators must most of all be aware of what they do not know. Uncertainty management has already been studied in the context of translation. Erik Angelone notably has written an interesting paper on "Uncertainty, uncertainty management, and metacognitive problem solving in the translation task"[4]. He defines the term as follows:

> Uncertainty management is associated with problem solving and occurs when translators experience uncertainty (a cognitive state of indecision) upon encountering translation problems. (Angelone, 2010: 17)

I use the term in a much narrower sense. Whereas Angelone is interested in the mental behavior of the translator who interrupts the translation process because there is a doubt, I focus here only on the deciphering of the source text. Angelone explains that, for purposes of discussion in his paper:

> The problem-solving behaviors can be associated with three fundamental *translation-oriented* cognitive processes: (1) source language comprehension, (2) source language-target language transfer of meaning, and (3) target language text production. (Angelone, 2010: 17)

By "uncertainty", I refer only to the deciphering of the source text in relation to its semantic content, because this is what is specific to technical translation. Unlike Angelone, I consider only part of the comprehension process (that which is related to "objective" difficulties of the source text), and exclude the problems linked to transfer or production.

Good technical translators are those who never rely on probabilities or intuition, but keep challenging their own convictions and presuppositions. This means they cast doubt on just about everything they do not know for sure. Of course, the more they objectively know, the quicker the translation process will be, as there will be less to elucidate. Once they have defined what needs to be explained, checked or researched, the next stage is to set about clarifying uncertainties. There, the method applied varies according to habits and preferences. Some translators take the time to gain a real insight into the subject matter (which is

[4] "Uncertainty, uncertainty management, and metacognitive problem-solving in the translation task", in *Translation and Cognition*, Shreve Gregory and Angelone Erik, 2010 Benjamins, American Translators Association Scholarly Monograph Series, XV, Philadelphia, pp. 17-41.

worthwhile for a long text or if there is a high probability of receiving work in the same field again). They can use encyclopedias, monographs, glossaries or any other tools they may choose. In general, they will start by looking for on-line documents: theses, reference documents produced by authoritative institutes or authors and, when there are no other resources, turn to sites which might be less reliable and whose elements will need to be validated with due caution. Ideally they will have the opportunity to consult the author and expert (who may be the client).

Now, what are these so-called "objective" difficulties? I use this term to describe aspects of the text whose meaning remains uncertain for the non-specialist. Of course, the types of difficulties depend on the language pair. In the following section, I will present what I consider to be the main problems for a French translator.

3. THE CHALLENGES FOR THE FRENCH TRANSLATOR

3.1 The Reader's Lack of Implicit Knowledge

In our daily exchanges or while reading texts dealing with everyday matters, our cognitive resources help us clarify many ambiguities. People can thus live with a certain degree of vagueness of expression or some grammatical blur: their prior knowledge helps them to spontaneously eliminate interpretations which do not make sense within the context. When approaching a text referring to a field he is familiar with, the translator can therefore easily deduce or infer the meaning. The situation is quite different when the subject matter is totally unknown to him.

One of the major difficulties is determining how many nouns an adjective is used to qualify, as can be seen in the following example:

> The contractor shall, on a result oriented basis, execute maintenance work on specific components of various types of high vacuum pumps, gauges and valves.[5]

You may ask yourself whether you should interpret the sentence as referring to components:

1) of various types of high vacuum pumps, high vacuum gauges and high vacuum valves
   or
2) of various types of high vacuum pumps, various types of gauges and various types of valves.

If you know for certain that the text has been produced by a literate technical writer, you may consider that he would have formulated the sentence differently to express the second option (by adding "as well as" before "gauges and valves"), but you must always take account of the fact that there is no certainty as to his syntactic competence.

In this case, the context can help you remove the doubt. The title of the document is

> "Requirement (Activity Code): Vacuum work on the CERN accelerators"

and, a little further, you can read:

[5] Source: (CERN) Advance information on forthcoming market surveys and calls for tenders.

> "Other functions required: The contractor shall provide a helium leak detection service and execute acceptance tests of vacuum components, both on the CERN site or in companies working for CERN…"

With vacuum a constant element throughout the text, the first option is clearly the correct choice.

The same problem may arise around a preposition, as the following example shows:

> "Connection to feed boxes equipped with industrial instrumentation for process monitoring, electrical equipment and other ancillary devices"[6]

There are actually three possible ways of reading this text:

First possibility:

Connection to
1) feed boxes equipped with industrial instrumentation for process monitoring,
2) electrical equipment and
3) other ancillary devices

Second possibility[7]:

Connection to feed boxes equipped with
1) industrial instrumentation for process monitoring,
2) electrical equipment and
3) other ancillary devices

Third possibility:

Connection to feed boxes equipped with industrial instrumentation for
1) process monitoring,
2) electrical equipment and
3) other ancillary devices

From the grammatical point of view all three options are possible. Only familiarity with the subject matter or – better – with the situation will enable the translator to exclude two of the three possible interpretations.

3.2 The Elusive Micro-Relationships Between Words

The English language has the ability to juxtapose words and imply a relationship between them. For the translator whose mother tongue does not allow this type of parataxis, there is a problem, because this relationship must be made explicit. If he does not know what the text is about, there is generally no way he can infer the type of relationship at stake. For instance, the following list, when translated into French, would require the use of very different connecting words:

fusion bonding

[6] Source: CERN specification
[7] The correct one.

fusion face

fusion weapon

fusion point

Fusion Committee

fusion food

fusion fuel

fusion protein

How can you guess whether the second term is *produced by* fusion, *to be treated by* fusion *relying on* fusion, *compatible with* fusion, *concerning* fusion, *involving* fusion or *necessary for* fusion?

Here are the translations of these terms into French:

fusion bonding	→	liaison par fusion
fusion face	→	face fusionnée
fusion weapon	→	bombe à fusion
fusion point	→	point de fusion
Fusion Committee	→	Comité sur la fusion
fusion food	→	cuisine fusion
fusion fuel	→	combustible pour la fusion
fusion protein	→	protéine hybride

Again, if you do not know the terms or if you do not know the field, there is no way you can guess how the words should be linked in the target language.

This type of question is the daily lot of the technical translator. In a CERN press release about a new discovery concerning the role of cosmic rays in cloud formation, I had difficulties interpreting the following sentence:

> Ion-enhancement is particularly pronounced in the cool temperatures of the mid-troposphere and above.

The expression "ion-enhancement" led me first to think that ions were enhancing some phenomenon. Then I came across the following explanation in a document detailing the background to the same experiment:

> We have found that natural rates of atmospheric ionization caused by cosmic rays can substantially enhance nucleation.

I was able to deduce that the expression "ion-enhancement" meant the multiplication *of* ions and not "*by* ions". The technical translator is a detective looking for clues, just about everywhere possible, and trained in interpreting them.

3.3 The Reader's Inability to Identify "Sub-Units" (Parsing)

A significant problem is that of analyzing information. The following phrase was the title of a CERN adjudication document:

> *Supply of fine blanked austenitic steel collars for the cold masses of the LHC superconducting dipole magnets.*

In order to translate this title, the translator needs to decipher that there is a machine, called the LHC, that this machine contains dipole magnets, that these dipole magnets are superconducting and that they are contained in cold masses. Another piece of information needed to translate this title is that the collars are part of the cold masses and that they are made of austenitic steel and fine blanked. Only after this stage of parsing can the translator start looking for the terms in the target language. A good means of processing such a title is to go through the text in order to see what the syntagms are. For example, the expressions "austenitic steel" and "superconducting magnets" are recurrent in the text. Then, by deduction or by duly validated inference, the translator can work out how the title must be analyzed.

The same difficulty also applies in less complex situations. Sometimes it is hard to even establish whether a word is a verb, a noun or an adjective. For instance, the following instruction, taken from an aeronautic maintenance procedure, is not easy to dissect.

> Remove safety pin, nut, washer and bolt attaching trigger lever assembly to ear on body.

Beside the need to establish whether "safety" is to be associated with the four successive nouns or if "safety pin" is a fixed term (which it is), one cannot exclude right away that *attaching* is a verb (to be understood as "by attaching") or, even, that "ear" is also a verb (to be understood as "in order to ear on body", whatever that might mean). Indeed, the parsing process looks a bit like a combinatorial analysis exercise, where you first consider all the different possibilities and then methodically reject those which are not acceptable until you find the right one.

3.4 Numbers and Units of Measure

Surprisingly, numbers and units sometimes need to be translated too. If you need to convert miles per hour into kilometers per hour, Fahrenheit degrees into centigrade or any unit of the imperial or United States customary system into the metric system, you have to be careful not to make a mistake. However, this is not only a question of arithmetic, but of common sense.

Should "a distance of 200,000 miles" be translated by "321 868 km"? This does not seem very probable. The absence of any significant digit below the hundred thousands leads to think that the value is given to the nearest hundred thousand. In some cases, the measure may be extremely precise even if it is a round number, but, provided nothing in the context indicates so, it seems wise for the translator to identify the smallest significant digit and reproduce the same level of precision in the French text. Whenever there is an indication that the number is an approximation, one should be careful to reproduce it logically. However, translators are sometimes too anxious to get on with the text to remember to check its rationale. Knowing that 1 mile equals 1609.344 meters, many students focus on the numerical conversion and forget to consider the consistency of their understanding, so that they translate

> "a distance of about 35 miles"

by

> "une distance d'environ 56, 32704 kilomètres"[8],

which suggests a precision of the order of four inches. Of course, if there is an indication of the degree of precision or of the measuring process, this can be taken as a basis to round the result.

A detail not to be neglected is the punctuation: whereas the separator (or radix point) is a dot in English, it is a comma in French. Conversely, whereas the thousands separator is a comma in English, it is a dot in French. The numbers are therefore worth paying attention to, if you consider that, between the following two sentences

> The machine weighs precisely 1.354 kg.

and

> The machine weighs precisely 1,354 kg.

there is a real difference in meaning which, in some cases, could have very serious implications. Similarly, if you translate into French the following sentence

> The marathon is a long-distance foot race with an official distance of 42.195 kilometers.

without dealing with the punctuation, you end up raising the length of the race by a factor of 1000:

> Le marathon est une course à pied de grand fond, sur une distance officielle de 42.195 kilomètres.

You will not appeal to rational runners as, for a French-speaker, this implies running more than forty thousand kilometers.

Even if they sometimes complicate matters, it would be remiss of me not to pay tribute to units, because they are a great support for the technical translator. They function like signposts and generally clarify the text. Each unit is associated with a physical quantity which may give the translator some clues. Units obey rules of another code and therefore give us precious information which can remove ambiguity as to the subject matter. A word like *power* can be misleading, because it can have different meanings. If it is measured in watts, then you know what is meant: it is indeed power (work per unit of time). Sometimes it should be interpreted as energy and sometimes as electrical power and it can be assimilated with current. If you read:

> "The screws were driven with a power of 3.9 ampere."

you understand that what is meant is an electric current.

Recently, I had to translate a specification for cleaning services. The requirements included the item "work rates". The firms had to "indicate the work rate adopted per work programme

[8] In French numeral writing, the decimal point (or separator) is marked by a comma.

and per type of premises for the presentation of [their] offer" and complete a table. The first column was devoted to "maximum work rate for ordinary cleaning" and the second to "maximum work rate for floor restoration". I was quite at a loss until I discovered the units [m^2/h]. Once I had understood that it was a matter of square meters by hour, I could make out that the firm was being asked to indicate the speed of work it had taken into account to calculate its price. This would enable CERN to be suspicious of firms that were planning to work unusually fast.

3.5 Terminology

Contrary to what many people think, terminology is not necessarily a problem for the translator. If the text relates to a very specific field and if this field is not new, there is a high probability that the terms can be found in glossaries. The real difficulty is sometimes to identify the terms. As explained above, some parsing is necessary here, and the greatest problem is sometimes to see where the term starts and where it ends (that is, to establish whether it corresponds to one word or more).

The first task is to identify to which field the term belongs. The translation of the term "beam", for example, varies according to the different domains. If you look it up in a technical dictionary, you will discover that it can be part of a press, an engine, a balance or a plow. The term is to be found (sometimes with different translations within one single field) in the areas of fishing, construction or particle physics. What is to be done if your text mentions a beam in the context of particle physics? The only solution is sometimes to ask the author what is meant. Besides, the translator must not forget that the term can be an acronym (BEAM actually stands for "Brain Electric Activity Map" in medical imaging). Finally, one should never exclude that what looks like a term could be a simple word. A beam can be a ray of light, of course, and, used as a verb, it can mean to smile.

My students had quite a hard time translating a text I had given to them. The title was:

A falcon 50 PIC makes a steep approach and encounters 2 different aircraft[9]

Most of them thought that a "falcon 50 PIC" was an aircraft and decided that, being a code, 50 PIC need not be translated. They did not see that the acronym "PIC" refers to pilot-in-command and that this term has been officially approved by the International Civil Aviation Organization[10].

Before translating a term, it is therefore necessary to ascertain the field it belongs to and to check that one's reading of the text is the only one possible.

3.6 The Weaknesses of the Original.

In his book, *Technical Translation: Usability Strategies for Translating Technical Documentation*, Jody Byrne insists on the scope of the translator's intervention in the

[9] NASA ASRS Report 556924, August 2002.

[10] Termium defines PIC as follows: The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight.

technical field. He establishes a parallel between the technical writer and the technical translator, his idea being that both could be called technical communicators.

> That the lines separating the role of technical translator and technical writer have become somewhat blurred is inevitable. (…)
> Perhaps first and foremost, technical writers are, to a certain extent, not unlike translators in that they need to "translate" what Van Laan and Julian (2002:18) call "geek-speak" into clear and understandable English. (…) a technical writer gathers information from a variety of sources including documents that were produced by and for experts such as programmers and engineers. With this come the inevitable infelicities of style, excessively technical content or indeed missing information. This information needs to be rebuilt, reinterpreted, remodeled and restructured so that it can be understood and used by the reader. Likewise, the translator needs to transform information from a form which was produced by and for speakers of the source language into a form which can be understood by the target audience. This is achieved by editing, rearranging, adding and even removing information.[11]

Byrne refers to Göpferich's and Amman & Vermeer's notions of the translator becoming the "intercultural technical writer" or the "cross-cultural writer". In his book, he underlines[12] that:

- additional information is sometimes required "to help ensure that the information and text are as usable and effective as possible" (Byrne refers here to Göpferich (1993:52));

- omission, condensation or implication are sometimes necessary "in order to protect the integrity of the communication";

- rewording, editing or upgrading of a text may be useful if the source text is poorly formulated;

- reorganization of the text may be useful, for example where instructions from a user guide do not "match the actual sequence of actions the reader needs to perform";

- changes to the sequencing of sections are sometimes useful to adapt to "cultural norms relating to the structure of a particular type of document";

- addition or clarification of segments may be useful to conform to legal requirements on technical texts in the target language.

In my view, the translator should make use of his relative freedom whenever the source text is not accurate. In actual fact, the rather low quality of drafting is one of the main difficulties for the translator, who must sometimes translate irrespective of what the text appears to say.

First of all, the translator should correct the style if it is not clear, concise, unambiguous and consistent. For example, if a user manual contains the following instructions

- Put the kettle base on a cool, solid, even surface,
- The kettle should never be immersed in water,

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[11] Jody Byrne, *Technical Translation: Usability Strategies for Translating Technical Documentation*, Dordrecht (Netherlands): Springer, 2006, pp. 17-18.
[12] *Ibid.* pp. 18-19.

- You must keep the kettle out of the reach of children,

the translator had better harmonize the instructions so that they all follow the same pattern, because this will ease the task of the reader. The text would indeed have gained in clarity if it had read as follows:

- Put the kettle base on a cool, solid, even surface,
- Never immerse the kettle in water,
- Keep the kettle out of the reach of children.

Sometimes, information is blurred by the poor style.

In "Parts of a Nuclear Reactor – Pressurized Water Reactor", the following description is given:

> The fuel assemblies are collections of fuel rods. These rods are each about 3.5 meters (11.48 feet[13]) feet long. They are each about a centimeter in diameter. These are grouped into large bundles of a couple hundred rods called fuel assemblies, which are then placed in the reactor core.[14]

The way information is given here is not as effective as it could be. The translator would be wise to reorganize the paragraph so that it becomes clearer. Indeed, the notion of "group" is repeated too many *times (assemblies, collections, grouped, bundles, a couple hundred, assemblies).* Besides, the text goes from the assemblies to the rods, back to the assemblies and then to the rods again. By rephrasing the original, one could indeed make it easier to understand and to translate. The French translation would be the equivalent of:

> *Rods, which are each about 3.5 meters long and about 1 centimetre in diameter, are grouped into bundles of a couple hundred units called fuel* ***assemblies****, which are placed in the reactor core.*

The number of words would be reduced from 49 to 33.

In my opinion, the translator should not hesitate to intervene if this serves the interests of precision, accuracy, logic and semantic coherence.

Recently, I was asked to revise the translation of a book about CERN. One sentence surprised me. It had been faithfully translated from the original, which was the following.

> Here at the LHC we have bundles with 1011 protons.

A bit further in the chapter, I found this:

> We are looking how the Universe evolved shortly after the Big Bang, in the first million millionths of a second, 10-12 seconds.

Considering that these pieces of information were suspect (because the number in the first clause seems unrealistic and the second sentence does not make sense), I remembered that the

[13] About this conversion, see my comment in the section "Numbers and units of measure"
[14] Source: Thinkquest, http://library.thinkquest.org/17940/texts/fission_power/fission_power.html.

powers of ten are a specific problem, because changes in the formatting of font can occur when sending or copying a text.

After having checked, I was able to conclude that the LHC bundles contain not 1011, but 10^{11} protons (that is, 100,000,000 times more protons) and that the number of seconds that elapsed after the Big-Bang was not 10-12, but 10^{-12} (that is 10,000,000,000,000 times less).

To give a final example of cases where the translator may "correct" the meaning, here is a description found on a web-site:

> **Precipitation** is water being released from clouds as rain, sleet, snow, or hail. Precipitation begins after water vapor, which has condensed in the atmosphere, becomes too heavy to remain in atmospheric air currents and falls.[15]

The second sentence is not logical, because it suggests that rain is heavy vapor falling on earth. If I had to translate the sentence, I would formulate it differently. A first possibility would be:

> **Precipitation** begins after water, which has condensed in the atmosphere, becomes too heavy to remain in atmospheric air currents and falls.

A second possibility would be:

> **Precipitation** occurs when water, which was in the form of vapor in the atmosphere, has condensed and becomes too heavy to remain in atmospheric air currents and falls.

As soon as there is a doubt about its quality or its relevance, the translator must question the original and should not hesitate to intervene to improve it, provided he is absolutely certain that he will indeed improve the text.

4. CONCLUSION

The special status of technical texts with respect to extra-linguistic reality has a definite impact on the approach required for their translation. As their main function is to reflect reality as it is, the translator should focus as much on this as on the source text. Whereas a literary translator might focus on the form of a novel and the translator of a political discourse might concentrate on the intention of its author, the preeminence of the objective content in a technical text allows its translator to disregard both its form and the author's intention. The translator may well rephrase the text quite freely, reorganize its structure and even redefine some of its elements if this serves the purposes of clarity and adequacy. If the original text lacks coherence or does not correspond to the context of the target readership, translating it might involve a certain amount of redrafting.

[15] Source: WGBH Educational Foundation

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