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The Study of Technical and Scientific Translation:
An Examination of its Historical Development

ABSTRACT

This article tries to show and explain in some detail the quantitative and qualitative evolution of the bibliography on technical and scientific translation throughout history as compared with other research fields. The underlying corpus drawn on are the more than 20,000 entries collected in BITRA (Bibliography of Interpreting and Translation) up to September 2003. This bibliographical tool is an online multilingual database which attempts to comprise everything ever published on translation and can be freely accessed on http://www.ua.es/dfing/tra_int/bitra_en.htm. The paper concludes that concern for technical and scientific translation only appears in the 1950s, when obsession with canonicity seems to decline somewhat within Translation Studies. A further finding is that consideration of this type of translation has been and remains mainly practical, with reflections on problems posed by terminological domains (mostly legal and, lagging far behind, medical, business and IT), teaching, documentation, the interpreting of technical discourse and professional issues as the favourite topics.

KEYWORDS

translation studies. technical and scientific translation, history, bibliography. research, theory.

Introduction

Technical and scientific translation has traditionally been the dogsbody of theoretical discussions of translation. The underlying rationale when approaching this type of translation has usually been that literature involves a creative elaboration of language, requiring the translator to re-elaborate language in a similarly creative way, whereas translators of technical and scientific texts only have to deal with a type of discourse where the vocabulary (terminology) is or at least tends to be univocal, having ready-made equivalents, and the use of language (style) is simple and straightforward. In other words, anyone with a reasonable command of a language and a high level of technical or scientific knowledge can write a good technical (or scientific) text, whereas very few can write a good poem or novel, even in their mother tongue - and the same would apply to translation. Thus, literary (including Bible) translation has always been in need of serious reflection, whereas technical translating only needed good technical practitioners who knew their terminology.

Classical authors in the literature on translation, like the much quoted Schleiermacher, even deny the title of translators to those who deal with non-literary or high scholarly texts (religious and philosophical, mainly), in a perfect representation of the traditional line of thought on this issue. Let me quote a not much known part of this author's famous text in an English translation:

The less the author himself appears in the original, the more he has merely acted as the perceiving organ of an object, and the more he has adhered to the order of space and time, the more the translation depends upon simple interpreting. Thus the translator of newspaper articles and the common literature of travel is, at first, in close proximity to the

interpreter, and he risks becoming ridiculous when his work makes greater claims and he wants to be recognized as an artist. Alternatively, the more the author's particular way of seeing and shaping has been dominant in the representation, the more he has followed some freely chosen order, or an order defined by his impression, the more his work is part of the higher field of art [...] On this double scale, therefore, the translator rises more and more above the interpreter, until he reaches his proper field, namely those mental products of scholarship and art in which the free idiosyncratic combinatory powers of the author and the spirit of the language which is the repository of a system of observations and shades of moods are everything, in which the object no longer dominates in any way, but is dominated by thoughts and emotions, in which, indeed, the object has become object only through speech and is present only in conjunction with speech.

[...] When, therefore, the speaker does not intentionally construct hidden indeterminacies, or make a mistake in order to deceive or because he is not paying attention, he can be understood by everyone who knows the language and the field, and at the most only unimportant differences appear in the use of language. [...] Translating in this field is, therefore, almost a mechanical activity [...] and in which there is little distinction between better and worse, as long as the obviously wrong is avoided. (Schleiermacher 1813)

But one needs not resort to the 19th century to find this sort of considerations. The Spanish philosopher Ortega y Gasset wrote in 1937 that translating technical texts was conceivable (whereas translating literary texts was impossible) because technical texts were not written in natural languages, but were themselves a kind of translation into a more or less artificial language, by which he obviously meant terminology. If you want something more modern, the extraordinarily influential *Encyclopaedia Britannica* (1974:22:583-4) says in its entry on translation that this is the only type of translation in which versions can be as good as the original. Pushing this argument *ad absurdum*, it ends up saying that in literary texts, translations are either inferior to the original or they are not "true" translations.

Indeed, discussion of translation has traditionally been characterised, among other things (Franco Aixelá 2001), by its obsession with canonicity. Only the translation of the Bible and the great classical authors seemed worth discussing (the rest is just "mechanical") within a secondary activity, like translation, which was, to start with, hardly worth dealing with in any depth at all.

In line with this idea, even now, when Unesco demands that the name of the translator should always be included, the name of technical translators is hardly ever to be found in any corner of their published work, especially in scientific journals. This fact reinforces the mechanical activity thesis, lowering the status of technical translators to that of mere technical support, a linguistic mirror with no special influence on the contents, outlook and effect of the published text, as long, of course, as they know their terminology.

Paradoxically enough, the contrary applies to payment, and technical translation is awarded much higher rates than its literary counterpart. The more or less explicit argument now (directly deduced from the law of supply and demand) is that there are very few who can understand and translate a complex technical text, whereas (almost) anyone can understand and, hence, translate a literary text (!!). Nevertheless, times seem to be slowly changing and lately (at least in the second half of the 20th century), it is possible to find some scholars and practitioners who

try to vindicate the complexity of the technical translator's role, in an attempt to account for this apparent contradiction. For instance, Jumpelt (1961:35) argues that:

The present study argues against the view that scientific prose can be perfectly or more easily translated [...] The contrary is true: the extremely high requirements set for scientific and technical translation mark it out clearly from other genres, making it into an independent research field in its own right. Over and above the ordinary desired qualities of a good translation, scientific translation additionally needs to respect both the referential function of language and the conventions of technical language to a degree that has no counterpart in other translation types as regards sheer precision of understanding of the surrounding world.

The truth is that technical translation has always represented the bulk of translated texts, and this is even more so now, at a time when the exchange of technical information and the need for community interpreters is a crucial and defining part of modern technologically advanced societies. This is finally being reflected in most BA degrees in Translation all around the world, which not only show an increasing weight given to technical translation in an effort to adapt to the needs of the market, but are starting to push literary translation into the background as an optional subject.

Also the recent dramatic upsurge of the academic study of language for specific purposes and, more importantly, of terminology as a branch of linguistics has brought about a new awareness of the complexity and structure of this type of texts and their translation. All in all, there seems to be a growing agreement that technical translation deserves much more attention, if only because it will be the main professional outlet for most of those enrolled in translation degrees and diplomas in our universities. Thus, it would make sense to explore the state of the art, to discover how things have fared and how they still do in the minds of the researchers.

What I would like to do here, then, is to offer some information on the evolution of discussion of technical translation as manifested in specific publications throughout history. In other words, to quote Jumpelt, I want to see how and when technical and scientific translation came to be a "research field in its own right."

With this aim in view, I will take use the data supplied by BITRA (Bibliography of Interpreting and Translation), a free online bibliography (http://www.ua.es/dfing/tra_int/bitra_en.htm) which already (September, 2003) comprises more than 20,000 entries. In spite of the huge size of the database, the information I shall examine will obviously be incomplete. Indeed, incompleteness is part of the nature of any bibliographical tool aspiring to cover everything published on an ever-growing subject, and the absolute figures quoted here must always be taken as provisional (indeed, figures should be higher by October 2003). A possible bias in the database, which I think should by now be rather minor, is the fact that it is mainly a personal project by a Spanish lecturer in English translation, so that English and Spanish texts may be over-represented. While I am on the subject, I would like to take this opportunity to encourage scholars, publishers and journal editors to contribute to the completing of this database,

thus increasing the chances that none of their efforts will be ignored by the Translation Studies community. In the website there is a very simple system for supplying new entries or abstracts via e-mail. However, while admitting its incompleteness, I would stress that BITRA is already a very representative bibliographical tool, which brings together about two thirds of the existing publications relating to our interdiscipline (judging by my own estimate of hits and misses in reference lists accompanying publications), so that the conclusions drawn from it should provide a fair picture of the current and historical state of published discussion of translation. Nevertheless, this also means that percentages will always be more reliable than absolute numbers, as the former are much less liable to change with the increase of the amount of entries in BITRA.

To help the reader follow which type of texts are considered as technical in this article, I should add that BITRA offers a thematic classification through a system of descriptors or keywords. In the database, "technical" is a keyword applied to publications on the translation of any text or text type in which there is a specific terminology belonging to a professional or academic field. The most common fields included in this category are "IT", "business", "medicine" and "legal" texts, which are themselves keywords. However, any text on unspecified technical translation (e.g. with a title such as *Scientific and Technical Translation*) or touching upon specific minority fields like chemistry or military affairs is also classified as technical, although without any further specific keyword, giving a total of 1,905 entries termed as technical in BITRA out of a sum total of 20,495 entries collected up to September 2003.

It is worth adding that the thematic classification used in BITRA is multiple and simultaneous, meaning that a single text may be classified at the same time, for instance, as "Technical" and "Machine" in the event that both subjects are central to a given publication (e.g. "An Experiment in English-Spanish Automated Translation of Medical Language Data"). This approach only reflects the way things are, and aims to make searching as complete as possible. However, it is important not to overlook the fact that some publications will belong to two or more categories simultaneously in our analysis. In some cases, e.g. the pair technical/Bible (5 entries including both keywords simultaneously) or technical/literary (26), this will be quite rare, but other pairings may well be more productive, e.g. technical/teaching (307).

A global overview

To start with, then, we have 1,905 publications (9.3%) on technical translation as compared with 4,314 entries (21%) on literary translation. This means that scholarly effort on the literary side of translation is 2.3 times higher than the discussion of technical texts. Even discussion of poetry, a distinctly minority genre, is comparable with that of technical texts, as it represents as much as two thirds of the figures for technically-oriented publications with 1,275 entries (6.2%). This backs up the idea mentioned above of the traditional focus of Translation Studies on canonicity. To quote Delabastita (1990:97) here:

The social sciences tend to select their objects of study on the basis of cultural prestige,

rather than intrinsic interest. It is often thought more prestigious to study Shakespeare than to study popular literature or, for that matter derivative phenomena such as translations. Those who do study translations, would therefore, rather study translations of Shakespeare than translations of TV soap operas.

And he is only speaking of literature. Indeed, there seems to be a scale as to what is traditionally worth a scholar's efforts. To begin with, we have the essentially Romantic idea that it is much better to study originals than translations, even if a given author has systematically been known in a given language area through translations (in fact, even though the scholar in question can only study that author through versions in his/her mother tongue, so that the conclusions are really drawn from translations and not from the original text). Translation is then a secondary (derivative) and invisible activity, and technical genres, which have traditionally had very little cultural prestige as a matter of language and style, are even less interesting if they have to be studied as translations. But that is only the old-fashioned view - or is it?

Let us take a look at the evolution of those 1,905 publications on technical translation as compared with the rest. I will divide time here into two great periods: before 1950 (before 1900 and 1901-1950), and then continue to analyse publications by decades until the year 2000. The reason for doing this is mere availability. Between, so to say, the "beginning of time" and 1900 we have 259 entries (always as collected in BITRA up to September 2003) dealing with translation, whereas in 1901-1950 the number is 340. It would make very little sense and only bring in bias to divide any of these two periods by decades. After the Second World War, things change completely for Translation Studies and in 1951-1960 we have 596 entries, whereas in 1991-2000 the number amounts to a surprising 10,450, offering us figures in which the proportional weight of individual exceptional works cannot slant the analysis any more. The period between 2001 and 2002 is not considered in detail here for two reasons. First, it is too short to provide a significant statistical comparison with past decades. Second, information on new publications is often slow to come and quite a lot of entries are still to be added to this two-year period before they can be considered sufficiently representative.

Before proceeding to analyse contributions on technical translation in some detail, here is a table with the quantitative and proportional evolution of works on this type of translation:

Source: BITRA, September 2003

	Total entries	Tech. & Sci. Tr. (absol. numbers)	Tech. & Sci. Tr. (%)
Until 1900	259	0	0
1901-1950	340	5	1.4%
1951-1960	596	38	6.4%
1961-1970	761	59	7.7%
1971-1980	1,594	119	7.5%
1981-1990	4,830	372	7.7%
1991-2000	10,450	1,071	10.2%
All years (incl. 2001-2003)	20,495	1,905	9.3%

Until 1900

Before the year 1900 the number of publications on technical translation collected in BITRA is exactly zero out of a total of 259 entries. Apart from the odd handbook (we must remember that translation was a crucial tool in foreign language teaching until the coming of the communicative methods) and some very exceptional works like Tytler's (1791, 1813), most of the texts listed are brief and general reflections/apologies on particular ways of translating. These are usually short texts placed mainly as more or less defensive prefaces, digressions or letters justifying individual translations (which is the case for nearly all of the traditional quotes in the history of translation, from St. Jerome to Humboldt). For obvious reasons of accessibility, this period is probably the least complete in the database, but still there are right now more than 250 entries for this period and not one of them deals with technical translation. It hardly seems that there is much more to be said as to the role of reflection on technical and scientific translation before 1900.

1901-1950

Between 1901 and 1950, we have 5 entries (1.4%) on technical translation out of a total of 340 publications for this period in BITRA. The first is from 1925 and is a 7-page article written by Charles Homer Haskins dealing with "Arabic Science in Western Europe." Clearly, given the length and the title, this first reflection is historical and will hardly touch upon the complexities or the nature of technical translation. The second entry, Max Meyerhof's article "On the Transmission of Greek and Indian Science to the Arabs" (1937) is exactly the same. Then we have a professionally oriented article (surprisingly modern at that) on "Le travail et les aptitudes des interprètes parlementaires" [The task and the skills of parliamentary interpreters], written by J. Sanz in 1931; an article on "Technical Translating Dictionaries" by A. L. Gardner (1950); and a 62-page booklet by various authors entitled *Translator, Spanish and French. Preparatory Tests for Civil Service*

Examinations, published in Milwaukee (Wisconsin) in 1942.

The other 335 entries have Bible translating (84 entries - 24.7%) and literary translation (102 - 30%) as the star subjects, showing rather different percentages as compared with technical issues. Although historical reflections (126 entries - 37%) on the reception of canonical authors and exegetical commentaries are the most usual subject (with titles such as *The Bible in its Ancient and English Versions or Translations from the Classics into English from Caxton to Chapman, 1477-1620*) we start to find some theoretical approaches to the nature of translation by authors such as Walter Benjamin (1923), Ortega y Gasset (1937) or Nida (1947). Nearly all of them either ignore technical translation or pass it over with a couple of comments on its more or less mechanical nature.

By the end of the first half of the 20th century, it must be said that English seems, somewhat surprisingly, to be already the *lingua franca* also in the theory of translation, with 229 publications in this language (67%), whereas other traditional "major scientific languages" like French, German or Spanish are all confined to between 30 and 40 entries (c. 10%). My own position as a Spanish lecturer in English translation is likely to bias the language distribution of BITRA, but all the same the difference between languages seems to be too great not to think that it shows a real trend.

1951-1960

In the 1950s we have a first dramatic upsurge of publications on translation¹, with a few new and very influential approaches to professional translating, like Vinay and Darbelnet's (1958). The growth is tenfold, with 596 entries, which means almost 60 publications per year, as compared with less than 7 publications per year in the half-century 1901-1950, not to speak of the period prior to the 20th century. In this decade there is a new discipline which accounts for at least 15% of the new interest: machine translation, with 89 entries, reflecting the birth of a period in which translating as an activity began its modern exponential growth coupled with the hope that computers would be able to cope with the task. This new interest in machine translation seems to be even greater than the traditional focus on literary translation (79 entries, or 13.2% for this period in BITRA) and only inferior to the other traditional darling of translation theorists: Bible translation, with 200 entries (33.5%). The latter figure is in great part due to the existence of a specialist journal, *The Bible Translator* (171 entries for the '50s), which to my knowledge was the first - and for a long time the only - regular journal specializing in the theory and practice of translation until the launching of *Babel* in 1955 and *Meta* in 1956. Historical approaches also continue to represent a considerable part of research, with 65 entries (10.9%).

Out of the 596 entries, those on technical translation add up to 38 (26 articles, 3 chapters and 9 books), reflecting another dramatic upsurge not only in absolute figures, but also as regards percentages, with a surprising 6.4%, which seems to point towards a new interest in Translation Studies.

Let us take a closer look at the thematic distribution of these 38 entries, to see if

the quantitative difference is coupled with a qualitative one. The answer is yes but with reservations. We have 9 entries on more or less general issues linked to the theory and practice of technical translation, with titles such as Holmstrom's (ed.) 1957 *Scientific and Technical Translating and other Aspects of the Language Problem* or several works by Rudolf Walter Jumpelt like his "Methodological Approaches to Science Translation" (1959)ⁱⁱ. Texts like these seem to reflect a desire to transcend the purely instrumental and to go into this type of translation in some depth, in an attempt to establish a new approach worthy of the name of scientific research. All the same, terminology and the study of language for specific purposes were not yet important academic disciplines yet and most of the entries we have for this decade reflect a very practical approach, focusing on issues like the best specialized dictionaries (e.g. Holmstrom's (1951) *Report on Interlingual Scientific and Technical Dictionaries*) or the profession (e.g. Kalé's (1956) "Technical Translating Services"). Also from this period (1959) is the first work by the prolific scholar Henri van Hoof recorded in BITRA ("Réflexions sur la langue médicale. Le point de vue du traducteur scientifique" [Some reflections on medical language. The scientific translator's point of view]).

As I mentioned before, this period also witnessed the launching of two essential journals in the history of Translation Studies: *Babel* (1955) and *Meta* (1956). The existence of theoretically ambitious and specialized journals is clearly a symptom and a cause. It is a symptom because their mere existence, wide readership and survival through so many decades indicates that there was now a specific interest in Translation Studies, with many language departments subscribing to these journals, which touched upon a subject until then considered too secondary to merit much academic attention (not to speak of a specific specialist journal, the same as with technical translation, whose first specific journal is born here and now, in 2003). It is also a cause for the simple reason that the new journals provided a new academic platform for a growing research area which until then had not had its own specific academic space and was lost among all sort of linguistic, literary and scientific journals. Now there was a niche for translation, a prestigious academic space for the work of scholars assured of being read by people with a positive interest in this new research field, and this clearly multiplied investigation.

Babel, the journal of the FIT (Fédération Internationale des Traducteurs) is responsible by itself of almost half (16) of the publications recorded in BITRA for 1951-1960. *Babel* is a historical journal which also greatly helped in the developing of Translation Studies, especially in practical- and professional-oriented matters, with at least 49 articles on technical and scientific translation throughout its history. However, given the shortage of translation journals, *Babel* has also had to cover "pure" theoretical research too, transcending its initial role as a professional journal.

Also from this period (1956) is the journal *Meta*, published by the Université de Montréal and accessible on the Internet back to volume 11 (1966), which is why BITRA has no entries yet for the first 10 years. *Meta* is the other specialist historical publication with a wide readership in our discipline. It has always shown

a marked interest in terminology (especially French-English) and, since it is a university journal, in teaching matters. Both of these facts explain why it has provided at least 345 articles on the translation of this type of texts.

Among the publications of the 1950s it is also worth noting the significant presence of Russian as a language, reflecting a clear geopolitical interest in the middle of the Cold War. With this background, all the texts are of course focused on Russian-English translation, some, like the (1958) *Linguistic and Engineering Studies in the Automatic Translation of Scientific Russian into English: Technical Report*, even prepared "for Intelligence Laboratory Rome Air Development Center, Griffis Air Force Base, New York, by Department of Far Eastern and Slavic Languages and Literature and Department of Electrical Engineering, University of Washington. Contract AF 30(602)-1827."

It is also interesting to note that in this period English is already by far the dominant language in translation research, including the study of technical translation, with 452 (75.8%) publications in English as against 68 (11.4%) in French, 38 (6.4%) in German, and 22 (3.7%) in Spanish. Within the specific field of technical translation, we have 29 entries out of 38 in English (76.3%). French and German lag behind, with 4 (10.5%) and 3 (7.9%) texts respectively.

This fact, which will be confirmed at a global level in our research into later years, is a sign that Translation Studies, at least as regards this issue, is not different from other scientific disciplines. Even if their nature could lead to suppose that they would be a very much more balanced multilingual field, the wish to be read and the *lingua franca* nature of English at least since the Second World War leads writers of scientific articles (like this one I am writing now) to use English instead of their mother tongue in search of a broader readership.

1961-1970

The 1961-1970 decade once again shows a clear growth, with a total of 761 entries, 59 of them on technical translation, again as recorded in BITRA up to September 2003. The proportion of technically-oriented articles is now 7.7%, with literary (132 entries - 17.3%) and Bible translation (133 - 17.4%) taking, as always, the leading role and accounting between them for more than a third of the publications, although this is down from almost half in the previous decade. Texts dealing with historical issues of translation are also still quite important, although they seem to be losing weight, with 59 entries (7.7%).

Machine translation is still a core subject, at least until the publication of the famous ALPAC (Automatic Language Processing Advisory Committee - National Research Council [U.S.]) report in 1966, which concluded that interlingual translation by computers, if possible at all, was still very far away. All in all, machine translation still represents 6.4% of the total entries, and we will see that academic interest in this field will recover out of sheer economic necessity, though with less ambitious forecasts as to performance. All the same, it will never again be comparable with research on literary issues. It is important to remember that in the 1950s there are more entries on machine translation than on literary texts.

This decade also sees the core production of linguistically-oriented pioneers in the theory of translation, such as Eugene A. Nida, Georges Mounin or John C. Catford. Their work will be absolutely central during the third quarter of the 20th century, focusing translation matters on the issues of equivalence, translatability and contrastive linguistics. These are all lines of research which still arouse the interest of many authors, although the more theoretical branch of autonomous Translation Studies now seems to concentrate more on other issues, like the historical and the current role of translation(s) and translators and the image of "the other" they convey.

The 59 entries (48 articles, 8 books, 2 chapters and 1 PhD thesis) on technical translation show some awareness of issues of general theory, with 11 entries (18.6% out of all dealing with technical translation) which could be classified as "general reflections" (e.g. Horguelin's 1966 article on "La traduction technique" [Technical translation] or Cunningham's 1970 chapter on "The Interaction of Literary and Technical Translators"). Practical matters, especially on particular English-French terminologies from the journal *Meta* (e.g. Grandpré's 1967 article on "Vocabulaire des assurances sociales" [Vocabulary of social security]) or other publications dealing with particular text types still represent the bulk of researchers' interest, with 32 (54% of technical entries) publications of this kind.

Meta is indeed crucial as regards texts on technical translation for this period, with 40 (67.8%) of the entries coming from this journal. This figure also represents a considerable percentage of the total number of articles published by this Canadian journal for the period (40 out of 111, i.e. 36%) and clearly shows its practical vocation, especially in its attempt to fill gaps in terminology in the English-French language pair. For some reason, *Babel* shows a distinct slackening in its interest in this type of translation, with only 4 articles out of 49. Although it is true that a great part of the articles from *Meta* are included in BITRA for this period whereas many articles from *Babel* are not, it is logical to think that proportions should not change too much as the process of compilation of entries has no known bias. In any case, the fact that more than two thirds of the entries on technical translation come from one specialist journal (almost 75% if we include *Babel*) clearly confirm the crucial role played by these publications. If we were to disregard them, research on translation would depend to a great extent on sister disciplines such as linguistics, history or literary studies, which necessarily have a different focus and place limits on contributions which are not central to its aims.

The major areas of translation research as determined by technical text types begin to establish themselves in this period, with 6 entries on medical translation, 8 on legal texts, 11 on business texts and a couple of them (we are still in the 1960s) on IT texts.

As to language distribution, things remain very much the same, with 387 (50.8%) in English, 200 (26.2%) in French, 115 (14.4%) in German, and 44 (5.8%) in Spanish. It is true that French is much more represented in this case, and the reason must once again be sought in the considerable production of specialist journals which foster contributions in French, like *Meta* (and to a lesser extent

Babel). Indeed, almost half of the publications in French come directly from *Meta*. The fact that *Meta* promotes the use of French (92 articles in French and 19 in English for this period), together with its many contributions dealing with technical translation, help to explain the contradiction between the language generally used and the majority language for this decade when we analyse only published research on technical translation. Thus, 45 out of 59 (76.3%) entries on technical translation are in French, and 40 of them come directly from *Meta*, which published nothing in English on technical translation in the 1960s. Of the other 14 entries not coming from *Meta*, English is once again restored to hegemony, with 11 entries in this language from all sort of sources.

1971-1980

This decade, together with the 1980s, can be considered the takeoff point for Translation Studies as an autonomous discipline, with seminal works by pioneering authors such as James S. Holmes, Gideon Toury, Wolfram Wilss, Albrecht Neubert, George Steiner, Hans J. Vermeer, Katharina Reiss and others. This is also shown through a huge increase in the production of works focused on translation, with 1,594 entries collected in BITRA (up to September 2003) doubling the production of the 1960s and starting what could be termed the "golden age" of Translation Studies during the last quarter of the 20th century. To give some idea of this new interest in translation and interpreting, it should suffice to say that we have almost 5,000 entries in the 1980s and more than 10,000 in the 1990s, and that the number of specialist journals rises from less than 10 to more than 70 at present, most of them completely focused on Translation Studies.

Once again, literature (299 entries - 18.7%) and Bible translation (240 - 15%) represent by themselves a large part of the production of these years. Machine translation is represented by 75 entries (4.7%), confirming a low interest now that machine translation is no longer considered a very practical or at least nearby solution to translation problems. Other issues, like the history of translation (197 - 12.3%) or professional matters (112 - 7%) continue to thrive in our discipline, which is still characterised by its variety. Interpreting, for its part, seems to be beginning to find its own niche within Translation Studies, with 96 entries (6%), 4 of which touch upon the translation of technical discourse. Finally, teaching matters start to reflect the new degrees in translation and interpreting, and already represent a very important 11.2%, with 178 entries.

As to language, English once again accounts for about half of the publications, with 719 entries (45.1%), while French follows with 460 (28.8%) and the other usual ones lag far behind (German is 15.3%; Spanish is 6.5%; Russian is 2.9%, Italian is 2%; and so on).

Publications on technical translation are also doubled in absolute numbers in this decade, with 119 entries (7.5%), which - and this is what really matters when analysing the role of technical translation within Translation Studies - is practically the same proportion as in the past decade. The influence of *Meta* is still very high and as pervasive as in the 1960s, with 78 (65%) of the entries on this type of translation coming from the Canadian journal. Once again, this traditionally

French-speaking journal's focus on technical texts involves a distortion as to the proportion of languages, with 88 entries (74%) in French, 71 of which come directly from *Meta* (with only 7 articles on technical matters written in English). Curiously enough, in this period *Babel* seems to focus on theoretical matters and only has 2 articles (out of 34 included in BITRA) on this type of translation. All in all, 23 entries (19.3%) on technical translation are written in English, and if we exclude those coming from *Meta*, English represents 15/41 (36,6%), which is much closer to the overall proportion.

As to the subjects these 119 entries deal with, the first thing to be said is that one of the main objectives of *Meta* as a journal is to offer English-French terminologies for all possible technical fields, via articles such as Henry's (1971) on "Terminologie des grades universitaires (3e partie et fin)" [The terminology of university diplomas (3rd final part)] or Couture's 1972 contribution on "Quelques termes de soudage" [Some terms related to welding]. Interesting and practical as they undoubtedly are, they do not seem to reflect a representative trend in the majority interests in Translation Studies, even within the particular area of discussion of technical translation. However, it is perfectly understandable that a Canadian journal on translation should set as one of its main aims to settle the issue of French-English terminology, even if this is a secondary matter for other translation journals published in multilingual countries like Spain or Belgium.

on legal translation, 18 on business, 6 on medicine, 2 on IT, and 26 on other assorted fields, making a total of 80 entries (67.2%) out of all those dealing with technical translation. It seems clear that this branch of Translation Studies has always been heavily characterised by a very practical side, and this seems logical in view of the specific needs of the translators and trainees who perform this activity.

1981-1990

Once again, the growth of publications is simply dramatic as we draw near the present. The 1,594 publications of the 1970s now turn into 4,830, and the 119 focused on technical translation become 372 in the 1980s, although the proportion (7.7%), and hence the relative weight of this type of texts in the general framework of translation studies, remains very much the same between 1960 and 1990.

The distribution of publications in the '80s shows some significant changes as compared with past decades. To start with, we have 439 entries (9.1%) on Bible translation. This field is still very important in quantitative terms, but it seems to be losing its central position with the appearance of new, more professionally- and academically-oriented fields, like professional conditions (286 entries - 5.9%) or teaching, which continues to grow and now has 684 entries (14.2%), apart from the traditional interest in the history of translation (648 entries - 13.4%) or literary issues, which maintain all their traditional strength with 1,000 entries (20.7%). Machine translation attracts the interest of 355 entries (7.3%), continuing to be an important field within our discipline. Interpreting, for its part, maintains its upward trend on its way to playing an important part in Translation Studies, and moves on from 6% in the '70s to 9.8% (476 entries) in this decade.

As to language, English keeps its leading role, with 2,359 entries (48.8%), followed some distance behind by French (1085 - 22.5%), Spanish (621 - 12.8%) and German (595 - 12.3%), with the other languages lagging far behind (Italian and Russian, for instance, barely reach 1.5% with 71 entries each). Once again, the important work of *Meta* in the field of technical translation distorts language figures here, with 154/372 entries in French (41.4%) as compared with 137 (36.8%) in English, and 40 (10.7%) in Spanish and in German. If we exclude articles published in the Canadian journal, the figures would be 58 in French and 119 in English, in an almost perfect correspondence with the general language distribution for this period.

As to the distribution of the 372 entries on technical translation, the situation is a continuation of the trends already set in the 1970s. Thus, we have 95 entries (25.5%) on legal translation and interpreting, a field which has continuously gained strength, becoming very clearly the leading specific domain within technical translation. Medical and business translation maintain a fairly high profile, with 37 (9.9%) and 30 (8%) entries respectively, whereas IT translation seems to grow a bit, with 19 entries (5.1%). Teaching issues begin to represent a very important part of the whole, with 56 entries (15%) of the total technical contributions, 18 of which are handbooks more or less directly designed for university use. Other

practical matters like professional issues (22 entries - 5.9%) and documentation (40 - 10.7%) also represent an important proportion of authors' efforts. Finally, the general growth of interest in interpreting is also shown in this field, with 46 (12.4%) on technical discourse, more than half of which have to do with legal and administrative language.

1991-2000

In the last decade of the 20th century the production of published research within Translation Studies is doubled once again. Thus, we have no less than 10,450 entries (4,830 in the 1980s), 1,071 (10.2%) of which deal with technical translation (372 - 7.7% in the 1980s), representing a proportional growth which seems to be statistically significant for the first time in 40 years.

Literature, as usual, takes a leading role in the interest of researchers, with 2,333 entries (22.3%), whereas the other traditional core issue, Bible translation (423 entries - 4%), continues to lose ground at a significant rate. Teaching matters, for their part, seem to have reached a stable position within Translation Studies, with 1,448 entries (13.9%), surpassed only by literary considerations. Machine translation seems to maintain its secondary but considerable role, with 733 entries (7%). Interpreting continues to be an important branch of the discipline, even if it surprisingly seems to lose some ground as compared with the 1980s, including 794 entries (7.6%) in BITRA for the 1990s. Finally, the growth of Translation Studies has meant that other topics which until now had been practically ignored in the academic background begin to attract the attention of scholars. This is the case, for instance, of audiovisual translation, with 452 entries (4.3%) in the 1990s as compared with 1.3% in the 1980s or 0.7% in the 1970s.

As to language distribution, English, once again, represents around half of the publications, with 5,014 entries (48%), followed by Spanish (2,349 - 22.5%), French (1,575 - 15.1%), and German (1,039 - 9.9%) as majority languages. I do not dare to say that Spanish is suddenly growing so much as a language in Translation Studies. As I said before, due to my own situation as a Spaniard, it seems logical to think that it will be easier for me to keep in touch with my own country's production, so that Spanish works might be proportionally over-represented in BITRA. At the same time, it is true that although the first official Spanish centre providing a professional training in translation (the Universitat Autònoma de Barcelona) was not founded until 1972, the growth has been dramatic and there are now about 17 university degrees in translation in Spain, one of the highest concentrations anywhere in the world, and that means more conferences and more journals, at least 16 of which use Spanish as their main language.

In this regard, an example of the apparently growing proportion of Spanish authors in Translation Studies could perhaps be drawn from an international journal such as *Babel*. If we take the years 1985-1990, we have 2/84 (2.3%) of Spanish authors, but if we take the years 1995-2000, we get 20/98, that is 20.4%, with a surprising peak of 7/17 in the year 2000. In this case, the overwhelming majority of contributions by these authors are in English, but they

obviously have written a great part of their own production in Spanish. It may be that the growing presence of this language in Translation Studies really is growing.

In the case of the language distribution within technical translation, things change dramatically as compared with past decades due to the waning of the extraordinary influence previously exerted by *Meta*. As we have seen, the absolute figures of publications on technical translation are doubled in this decade, whereas *Meta* publishes slightly fewer articles on this type of translation (75 in the 1990s) and a higher proportion of them (25/75) are in English. All in all, the influence of this journal on the language distribution of entries on technical matters is greatly reduced, so that the resulting language picture is very much like the general one, with 447 entries (41.7%) in English, 185 (17.3%) in French, 84 (7.9%) in German and 313 (29.3%) in Spanish. Once again, this last language provides a percentage which, at first sight, seems excessive. Thus, there has been a considerable proportional increase (in the 1980s, Spanish was, like German, around 10%) while our method of compiling records has not changed. In spite of BITRA being based in Spain and the bias that this probably involves, I daresay that the weight of Spanish is clearly growing within Translation Studies, partly at least due to the academic reasons outlined above.

If we take a look at the distribution of the 1,067 entries on technical translation, we can see that things remain much the same as in the 1980s. There are 333 entries (31.2%) on legal translation, which seems to keep on growing as the leading domain in this field. By comparison, medical translation has 189 entries (17.7% of the entries on technical translation), business translation has 71 (6.6%) and IT translation has 89 (8.3%), the latter showing an important growth which can be explained partly if we consider that many of the entries deal with the new academic phenomenon of localization. Concern for the teaching of technical translation, as was only to be expected, keeps on growing, slowly but surely, and in the 1990s there are 185 entries (17.3%) dealing with it, including 46 handbooks. The interpreting of technical discourse, too, continues to attract an important part of the interest, with 124 entries (11.6%). In this last case, once again legal and administrative matters (with community interpreting as a new and important issue) represent well over half of the entries, with 92/124 (74.2%). As we see, generally speaking, the approach continues to be very practical, with other "non-academic" issues like professional conditions (94 entries - 8.8%) and documentation (116 - 10.8%) playing very important roles in this field. However, there are instances of publications that aim to provide a more global insight, like Durieux's 1991 lecture on "La créativité en traduction technique" [Creativity in technical translation], or Steyaert and Janssens' 1997 article on "Language and Translation in an International Business Context: Beyond an Instrumental Approach."

Conclusions

After analysing in some detail the history of publications on technical and scientific translation, it seems to be clearly established that there are three basic periods as regards research in this field: up to 1950 (with virtually no appearance of discussion of technical translation), 1951-1990 (an average of 7.3%) and 1991 to

the present (more than 10%), although the latter period is too short and requires confirmation in the coming decades for us to be completely sure of its statistical significance.

Up to 1950 we can say that this type of translation held no interest at all for scholars. Throughout those centuries, translation was considered a completely secondary activity, more a craft than a creative or influential task, and are hardly worth scholarly study. What little energy it did arouse was almost entirely devoted to the translation of canonical works (viz. the classics and the Bible), leaving virtually no space for the analysis of instrumental texts, where language was ancillary and considered to be univocal and, hence, to pose no problems apart from the necessary technical knowledge the translator must have.

Between the 1950s and the 1980s percentages show virtually no change at all (a difference between 6.3% and 7.7% is right now too small to be considered statistically significant), so that we can consider those 40 years of the second half of the 20th century as a second stage. This period after the Second World War can be considered that of the birth of the scientific approach to the theory of translation. The main difference between it and all the previous centuries is that researchers, mainly linguists at first, now tried to gain systematic insights into the core problems of translation instead of simply defending particular ways of translating. In the case of technical and scientific translation, there is a dramatic growth of reflection on this field, with figures rising from virtually 0% before 1950 to an average 7.3% in 1951-1980. This is still a very low percentage if we compare it with the 15-20% represented by entries on literary translation and if we consider that technical translating represents up to 80-90% of the professional demand for translators. The high profile of publications on literature is probably a direct consequence of its high scholarly status, coupled with the philological and literary education of so many of the current authors who deal with translation. Conversely, the clear decline of discussions of Bible translation, which drops from a peak of 25% in the first half of the 20th century to 4% in the 1990s, shows that there has been a deep change in Translation Studies, which seems as a discipline to be on its way to leaving behind its traditional fixation on canonical works to devote much more attention to the questions actually facing translators. The academic status of technical texts, terminology and language for specific purposes is a very modern issue which is only now starting to be comparable to literature and "pure" linguistics.

To move on to more specific matters, it is distinctly worth noting the extraordinary role played by the journal *Meta*, published since 1956 by the Université de Montréal, in the field of technical and scientific translation. Out of the 543 technical entries collected in BITRA for 1966-1990, 231 (42.5%) were articles published in *Meta*, a fact which clearly deserves to be studied on its own. All the same, it is also important for Translation Studies to say that the influence of *Meta* has declined with the passage of time. This means that the interest in technical translation is not a mere fad created by this journal, but an aim increasingly shared by many authors, journals and books all around the world. In this connection, it is enough to say that figures for articles on technical translation

Documentation is obviously a key issue when dealing with technical and scientific translation, as is shown in the 200 entries on technical documentation already mentioned (10.5% of those concerned with technical topics). This percentage is sustained throughout the second half of the 20th century, with the only non-significant exception of the 1960s, when no entry is recorded for technical documentation. This topic seems also to mark a clear difference between the interests of researchers on translation in general and on technical and scientific translation in particular. Thus, we have 10.7% on technical documentation in the 1990s as against 3.4% on non-technical documentation for the same period. The same happens in the 1980s, with 10.7% on technical documentation as against 3.5% on general documentation; and in the 1970s the difference is 10.1% as opposed to 3.7%. Obviously, the search for the right term is one of the distinctive characteristics of technical translation and related theory.

The analysis of technical interpreting also shows a clear increase within our field, as was only to be expected of this traditional (but no longer "poor") "relation" of Translation Studies. Thus we have a growth of entries on technical interpreting from 3.4% in the 1970s to 10.7% in the 1980s and 11.6% in the 1990s. The comparison of these figures with the evolution of interpreting in general for the second half of the 20th century is surprising, as it seems to show that research on interpreting was more concerned at first (1951-1980) with interpreting in general, whereas things have changed completely in the last 20 years (1981-2000), with (proportionally) many more entries on interpreting technical than non-technical discourse. Specific figures are as follows: in 1951-1980 we have 1.8% on technical interpreting as against 4.5% on non-technical interpreting, whereas in 1981-2000 the percentages are 11.1% on technical discourse as opposed to 7.2% on the non-technical side. Of course, both percentages grow with time, as interpreting has gradually come to be more important within Translation Studies, but specific research seems focus increasingly on the real type of (technical) interpreting trainees are liable to do, to the detriment of more theoretical and/or general considerations.

Finally, professional issues account for 7.7% of the total entries on technical and scientific translation as compared with 6.2% on labour conditions in non-specifically technical fields. The difference is too small to be considered statistically significant, and seems rather to show that in the second half of the 20th century, professional considerations have been paramount within Translation Studies as a whole, given that it is a discipline with a highly developed applied branch. This is even more true of technical translating, as it accounts for an overwhelming majority of the translating activity, so that many of the entries not termed specifically technical (e.g. "A Brief Description of Translation in China") deal to a great extent with technical and scientific translation together with other professional fields like literary or audiovisual translation.

I would like to end this contribution by stressing that all these figures and percentages are far from final. They come from what I think is a very representative but incomplete bibliographical tool, i.e. BITRA as of September

2003, so that figures and, in a much lesser degree, proportions must necessarily change as new entries are added. All the same, the results I have discussed here are, I believe, a very reliable indication of the trends shown by items discussing technical and scientific translation within Translation Studies.

Perhaps the most important conclusion is that the mainly quantitative development shown reflects the consolidation of our discipline thanks principally to the creation of scores of new university diplomas in translation and the launching of dozens of translation-oriented journals. There is now a broad readership directly involved in translation, often particularly in technical translation, and, most importantly, scholars are starting to have a new awareness of a discipline which at last is protected by the mantle of academic dignity. There are more and more people with things to say, and there is more and more publishing space in which to say them, free now from dependence on sister disciplines, like linguistics or literary studies, to place contributions which were often previously felt to be secondary. I have no idea how many texts are published worldwide on other disciplines, but surely a field that in the 1990s gathers at least (as recorded in BITRA up to September 2003) more than 1,000 specific publications per year in all sort of academic and commercial formats can be considered to have come of age. Furthermore, the launching of a new online journal, *The Journal of Specialised Translation*, completely devoted to technical and scientific translation, will surely mean an important increase in the number - and, let us hope that in the quality too, of publications dealing directly with this traditional 'poor relation' of Translation Studies.

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NOTE: BITRA (http://www.ua.es/dfing/tra_int/bitra_en.htm) provides an ever-growing body (it is monthly updated) of bibliographical entries, many of them annotated, on technical translation. The relevant keywords are all included in the keywords list, which can be accessed with just one click.

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