

I wish to express my gratitude to the Trustees who awarded me the AFLS Scholarship for the 1998-99 academic year. This support was highly beneficial to the completion of my doctorate research and writing-up of my dissertation for the following reasons:

- the regular meetings with my supervisor as well as the informal talks with other lecturers within the departments of Modern Languages, Mathematics, and Psychology at the University of St Andrews were very helpful to clarify and organise the results of my work. My topic (“Meaning and Translation: A Review of Theory and Practice of Machine Translation as exemplified by Applicational and Cognitive Grammars”) overlaps fields such as comparative linguistics, semiotics, logic, psychology, and philosophy. My extensive reading away from St Andrews between 1994 and 1998 was eventually structured this year thanks to these fruitful talks. My work over these past years would have been wasted if I had not been able to spend this final year in a proper academic and research environment;
- my research, started in 1993, suffered from two interruptions, since I had to work (as a lecturer in Germany, then as a technical interpreter in France) in order to pay the registration fees. The grants received this year lessened the burden of casual work, and allowed me to concentrate on my research;
- part of my research dealing with machine translation, I needed access to some powerful computer equipment. One company interested in the outcome of my assessment of the automatic translation of a complete set of French texts into English and German provided me with a translation package. My coming back to St Andrews (which would not have been possible without the grants I received) gave me the opportunity to have this software installed on the University network. These computer facilities (24-hour access, use of powerful computers, help of computer technicians) were a determining factor in the progress of my research. Over the past years, I had to focus my work on the literature dealing with the theory of translation and machine translation. At last, I have been able to compare this information with the actual outcome of a translation software package, and discuss some controversial issues in translation.

Although my dissertation is not completed yet, three chapters out of four, as well as the introduction, are finalised, and I have most of the data for the last chapter and the conclusion. I have good hope of finishing the writing up of these parts in the coming months.

My dissertation covers the following points:

- survey of machine translation: historical background, theory of machine translation and artificial intelligence, systems currently used (direct and transfer) or at the stages of theoretical research (*interlingua*), main difficulties and problems faced by machine translation, as well as promising results (for example, in the case of highly determined sub-languages, such as weather forecasts, or medical diagnosis);
- survey of different approaches to translation: conflicting views as well as complementary ones, attempt to draw the main constraints of translation;

- meaning: philosophical approach, meaning and logic, translation and the “transfer” of meaning;
- study of the automatic translation of *Le Petit Prince* (A. de Saint-Exupéry) into English and German (use of Power Translator Pro, Globalink). Attempt to determine the limits of a transfer system. The purpose was not a criticism of machine translation, but a study of some of the difficulties faced by a transfer system: unresolved ambiguities, cases where a transfer system fails to analyse a sentence, pre-editing of texts;
- study of published translations of *Le Petit Prince* into English, German and Russian. This study is focused on some characteristic features: units of translation, study of systematic correspondences of linguistic structures between the source and target texts. The limited scope of a D.Lang. dissertation allowed me to select only a few structures, but some results might be interesting. The purpose of such a listing of correspondences is to determine any systematic transfer operations, that might be the expression of cognitive processes involved in human translation;
- the last part of my dissertation deals with the study of the formalisation of these “transfer operations”, and focuses on Montague Grammar, as well as applicational and cognitive grammars, and their possible use in machine translation, within an interlingual architecture.

Translation would greatly benefit from being considered as an autonomous field of research, despite its obvious links with linguistics, psychology, sociology, philosophy and logic. Many shortcomings in translation studies (as exemplified by the failures of fully-automatic machine translation) are ascribable to the blind application of results of research on language to the process of translation. Translation expresses intertwined cognitive, psychological and socio-linguistic operations which have — so far — resisted formalisation. These operations are performed on texts belonging to different linguistic systems, with the purpose of producing an equivalent text or message in a different language, but this target text is supposed to trigger a similar reaction in a readership whose language and culture are different. One element is supposed to remain invariant in the process: *meaning* (transferred from the source text to the target text), but the issue of meaning is often skipped in translation studies, although it is supposed to be “encoded” in the words and sentences making up the texts to be translated. Meaning being traditionally the object of study of philosophy and logic, it is assumed to be analysed and transferred by translators, but it is left aside by most translation scholars. This “transfer of meaning” taking place in the mind of the translator actually expresses complex cognitive processes, dealing with conceptualisation and symbol manipulation. My research attempts to find any systematic linguistic transfer that might be the expression of these processes.

Some similitude in the syntactic features of the different translations (in English, German, and Russian) might be the first steps of a possible formalisation of translation processes. Moreover, it is widely admitted amongst computer linguists that fully automatic translation can be considered only for well-defined (“formatted”) texts. Automatic translation of specific kinds of texts (such as weather forecasts) is already successful, and even more accurate than human translation. But these texts present syntactic features (limited number of articles, use of infinitive verbs only, no pronouns, and so on) such that other — more general — texts cannot be parsed by these translation software packages. *Le Petit Prince* may be seen as a set of sentences forming a kind of sublanguage (limited, but nevertheless very rich syntactic structures, limited lexicon). The systematic transfer of some linguistic features (between this source text and the respective target texts) by human translators may indicate a new field of research in computer linguistics. The failures of direct and transfer systems to translate automatically “general” texts paved the way of recently launched programs of research on *interlingua*, intermediate artificial languages, the purpose being to provide a semantic interpretation of the texts to be translated. Universal Grammar, developed by Montague, and other formalisms, such as categorial grammar, or applicational and cognitive grammars, may provide some answers to the current problems of automatic translation. The main results of my research concern the features of texts likely to be translated automatically, and the possible formalisation of translation processes, with the use of mathematical tools such as lambda-calculus and combinatory logic, as developed by Richard Montague and some of his followers.

Chantal Guérécheau
D.Lang, 3rd year
Department of French
University of St Andrews
September 27th 1999