UNIVERSITY OF JYVÄSKYLÄ

TRANSLATING FICTITIOUS SCIENCE

A CASE STUDY ON THE TRANSLATION PROCESS OF TWO SHORT STORIES BY ISAAC ASIMOV

A Pro Gradu Thesis in English

By

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Department of Languages
2007

HUMANISTINEN TIEDEKUNTA
KIELTEN LAITOS

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Pro Gradu -tutkielma

Englannin kieli
Toukokuu 2007 68 sivua + 2 liitettä

Tutkielman tarkoituksena on selvittää tieteellisen tekstin kääntämiseen liittyviä ongelmia tieteiskirjallisuuden kääntämisessä. Lähtökohtana on kaksi Isaac Asimovin pila-artikkelia vuosilta 1948 ja 1953 ("The Endochronic Properties of Resublimated Thiotimoline" and "The Micropsychiatric Applications of Thiotimoline"), joiden kääntämisessä koettuihin ongelmiin tutkielma perustuu. Tarkoitus on perehtyä niihin käännösprosessissa vastaan tulleisiin ongelmiin, jotka liittyvät nimenomaan fiktiivisen tieteen kääntämiseen, ja selvittää, mitä nämä ongelmat vaativat tieteiskirjallisuuden kääntäjältä.

Nämä kaksi artikkelia kuuluvat Asimovin varhaiseen tuotantoon. Ne edustavat erikoislaatuista tieteiskirjallisuuden lajia: ne ovat kuvitteellisesta aiheesta kirjoitettuja tieteellisiä artikkeleita. Niitä ei ole juurikaan tutkittu aikaisemmin, mikä on osasyy siihen, että valitsin ne tutkielmaani.

Katharina Reissin ja Hans Vermeerin luoma skoposteoria sekä Christiane Nordin funktionaalinen tekstianalyysimalli muodostavat tutkielman teoreettisen taustan. Analyysin perusteella tehty johtopäätös oli, että tekstin vaikutus lukijaan sekä tuon vaikutuksen toisintaminen käännöksessä on oleellisin tekijä käännösprosessissa. Käännösprosessin aikana sekä käännöksen analyysissä keskityttiin niihin tekijöihin, jotka osaltaan edistävät oikeanlaisen vaikutuksen syntyä: tieteelliseen tyyliin ja terminologiaan, johon sisältyvät myös kysymykset neologismien kääntämisestä. Käännösratkaisut perustellaan käännöksen skopoksen avulla.

Käännösprosessin aikana kävi selväksi, että myös tieteiskirjallisuuden kääntäjän on hyödyllistä olla tutustunut tieteen eri lajeihin. Tieteellinen terminologia, jota kaikessa tieteiskirjallisuudessa esiintyy ainakin jossakin määrin, vaatii kääntäjältään asiantuntemusta ja tieteellisten ilmiöiden ymmärrystä. Tieteellisen tyylin hallinta on myös oleellista tämän tyylisessä tieteiskirjallisuudessa, missä tarkoitus on tuottaa tekstiä, joka kävisi aidosta tieteellisestä artikkelista.

Asiasanat: neologisms. science fiction. scientific style. skopos theory. translation process. translation studies. translation-oriented text analysis.

1 INTRODUCTION

The present study is a translation task, involving the translation of two of Isaac Asimov's short stories ("The Endochronic Properties of Resublimated Thiotimoline" and "The Micropsychiatric Applications of Thiotimoline"). These two stories belong to his early work; they are written in the 1940s and early 1950s. They represent a peculiar kind of science fiction sub-genre: they are spoof articles that are written as if they were real science, but their subject matter is completely imaginary.

Science fiction stories are full of scientific and technical vocabulary and references to real science, as well as to many science and technology related things, which do not necessarily have anything to do with reality. Moreover, there can be neologisms in these stories that do not exist outside their imaginary world. This is especially true in these two particular stories, as they are not traditional science fiction, but fake scientific articles. In this study, I will concentrate on the translation process of this fictitious science.

The stories I have chosen have not been translated into Finnish before. Because of their scientific nature, they provide much material for this study, which is one of the reasons I chose them. They are also interesting examples of early Asimov, who is nowadays considered one of the classic science fiction writers. Asimov himself points out that the first of these stories was what gave him the first taste of what fame is like: "It was the very first time my fame transcended the field," and, moreover, he says that "*Thiotimoline* was the first piece of non-fiction I had ever published professionally – the harbinger of a vast amount to come" (Asimov 1973: 474).

Interestingly enough, these stories seem to have received very little attention in previous research on Asimov, most probably because of their marginal position among his works. These spoof articles are quite different from his other science fiction and so are easily left aside when examining, for example, Asimov's style and characteristics of writing, but still they definitely are science fiction and as such are ignored also by those who are interested in his non-fiction writing. It is worth noting that even though the Thiotimoline articles are certainly a production of imagination, and as such belong to

fiction, in the quote above Asimov himself calls them non-fiction. This makes it clear how difficult it in fact is to pin down the exact genre of these articles.

Because of all this, it seems to me that these Thiotimoline articles are quite central to Asimov's career, and in a way they would be worth examining whether the study is concerned about his fiction or non-fiction. Translating the stories and then discussing the translation process is therefore, in my mind, well worth the trouble to get some insight to these intriguing pieces of science fiction.

Asimov was a scientist by profession – he had a doctorate in biochemistry – and he took science seriously also in his science fiction. He was careful not to write anything that would have been complete 'humbug', and he has himself stated (concerning early robot stories which in his eyes suffered from the 'Frankenstein-complex'), "as a person interested in science, I resented the purely Faustian interpretation of science" (Gunn 1982: 52). It naturally follows that also these two spoof articles are written in a very professional way, so that they even can be – and also have been – mistaken for real scientific articles.

My main goal here is to translate these two previously untranslated short stories into Finnish. The translation process will be examined from the point of view of translating the scientific and technical parts of the text. A problem related to this is the translation of the neologisms. I will also pay attention to other possible problems related to the genre of the stories that I might face during the translation process.

As a translation task my study naturally belongs into the field of translation studies. I will define the translation task with the help of Katharina Reiss and Hans Vermeer's skopos theory and Christiane Nord's text analysis model for translation. These theories will be described in chapter 2 as they form the basis of the theoretical background for my study. I will also discuss the general problems related to the translation of science and science fiction, and describe the current state of the art of these genres in that chapter.

Next, I will discuss Isaac Asimov and his work, previous research about him and his position in the science fiction tradition, both for his lifework in general and these two short stories in particular. Then I will move on to analysing the text and the skopos, after

which I will discuss the translation process and the decisions I have made based on notes I will take during the translation process and the different drafts of the translations.

2 THEORETIOCAL BACKGROUND

In this chapter I will present the translation theories that provide the background for this study, that is, Katharina Reiss and Hans Vermeer's skopos theory and Christiane Nord's additions to it. These theories give me useful tools for the analysis and translation of the stories. I will also take a look on the problems related to the translation of science and technology in general, and also on the problems of translating science fiction.

2.1 Skopos theory

For a long time one of the core questions in translation studies has been that of equivalence. To the second half of 20th century, translation theory debated over 'word-for-word' (literal) and 'sense-for-sense' (free) translations (Munday 2001: 19). As equivalence has been found to be a troublesome, stretchable concept that everyone interprets in a different way, it has been proposed that it is not even needed (Vehmas-Lehto 1999: 91). In its place skopos theory, among others, suggests adequacy. Adequacy means the relation between the translation and the target language and its recipients, the way the translation works in the target community (ibid.). It has been pointed out that once the translation has been made, it belongs only to one language community, that of the target language (Vehmas-Lehto 1999: 91-92). This point of view is the one also the skopos theory shares. According to it, translation does not have to be equivalent if it is good, and a good translation is one that can carry out its own function(s) (Vehmas-Lehto 1999: 92).

The term 'skopos' was introduced to translation theory in 1984 by Katharina Reiss and Hans Vermeer. It is a part of a theory of translational action (Reiss and Vermeer 1986: 58), in which translation is seen as a "variety of the translational action which is based on a source text" (Vermeer 1989: 173). Translation is, simply put, an action, and any form of action has to have a purpose or an aim. Indeed, as Vermeer (1989: 177) points out: "If no aim can be contributed to an action, it can no longer be

regarded as an action." Moreover, human interaction in itself is always determined by its purpose (Nord 1991: 93).

'Skopos' is the Greek word for 'aim' or 'goal'. In skopos theory the aim, or the *function* of the translation, is seen as the most important thing (Vehmas-Lehto 1999: 92), or, as Reiss and Vermeer (1986: 55) put it, the purpose of the translation is the decisive factor in all translation. It is more important that the function is achieved than that the translation is made in a certain way (Reiss and Vermeer 1986: 58). Reiss and Vermeer (ibid.) set the so-called skopos rule as the foremost rule in all translation theory: "Action is defined by its purpose (action is the function of the purpose)" or translation is the function of skopos, as they also put it. Skopos, on the other hand, is connected to the recipient: skopos is the function of the recipient (ibid.).

Reiss and Vermeer (1984: 119, cited in Munday 2001: 79) summarize the underlying rules of skopos theory as follows:

1. A *translatum* (or TT) is determined by its skopos.
2. A TT is an offer of information in a target culture and target language concerning an offer of information in a source culture and source language.
3. A TT does not initiate an offer of information in a clearly reversible way.
4. A TT must be internally coherent.
5. A TT must be coherent with the ST.
6. The five rules above stand in hierarchical order, with the skopos rule predominating.

Rule 1 presents the main idea behind skopos theory, while rule 2 relates the ST (source text) and TT (target text) to their functions in their linguistic contexts. The skopos theory claims that translation should always be seen from the point of view of the target culture, not from that of the source culture (Vermeer 1989: 175). This statement is quite sensible, since translations are directed to the members of the target culture, not to those of the source culture. Still, as rule 2 points out, the target text represents an offer of information about the offer of information supplied by the source text, or as Nord (2005: 36) puts it: "the translator offers information on certain aspects of the ST-in-situation, according to the TT skopos fixed by the initiator". As Nord (ibid.) points out, the source text does not necessarily have only one function, and what the translator focuses on is his/her choice, and this choice cannot be held definitive – it is not necessarily "*the* function" of the source text.

The irreversibility rule (rule 3) indicates that the target text's function is not necessarily the same as the source text's. Since the target text is oriented towards the target culture, it can diverge from the source text in regards to the goals which are set for it. The target text's skopos can naturally be – and often is – the same as the source text's function, but this is not obligatory (Vermeer 1989: 175). If it is, there is a certain sense of fidelity between the texts, but the demand for fidelity is always subordinate to the skopos (Nord 1991: 93), as the rules of skopos theory above indicate. The skopos of the translation can, in theory, be anything. Skopos theory does not define what principle has to be followed in the translation; it just says that there has to be *some* principle (Vehmas-Lehto 1999: 94).

The coherence rule (4) states that the target text "must be interpretable as coherent with the TT receiver's situation" (Munday 2001: 79) and the fidelity rule (5) simply states that there must be coherence between the target text and the source text, that is, between the source text information received by the translator, the interpretation the translator makes of this information, and the information that is encoded for the target text receivers (Munday 2001: 80). In other words, even though the target text does not have to share the source text's function, its function still should be somehow based on the source text. Christiane Nord has examined this question more profoundly.

As it is, the skopos theory allows the translator to choose *any* translation scope for the source text, but as Nord (1991: 93-94) points out, in fact the translator cannot always take this liberty even if that is what the customer wants. Nord introduced the concept of loyalty into skopos theory. By loyalty she means the responsibility of the translator, the fact that the translator has to consider the norms and conventions of translation in both the source and the target culture that determine the expectations of the partners in the translational interaction in regards to the relationship between target text and source text (Nord 1994: 107). In other words, the translator is responsible to the sender of the source text as well as to the receiver of the target text (Vehmas-Lehto 1999: 96). Although the translator is nowadays allowed to be more visible than before, the readers still expect the translations to follow quite strictly the source text. The translator has to consider these expectations, but s/he is not bound to them. For example, if the translator has translated a text in a non-literal manner, while the target text readers

expect the translation to be literal, s/he has to inform them about what s/he has done and why. (Nord 1997: 48). Loyalty can be defined as an essential moral principle between the people who take part in an action (Vehmas-Lehto 1999: 96).

Nord (2005: 10) defines skopos as the "definition of the prospective target situation" which is explained in the translation brief, the instructions given to the translator by the initiator of the translation task. Still, as she points out, it is the translator, not the initiator who is the expert on translation, and as the brief offered by the initiator can be very non-explicit, the responsibility for the translation rests with the translator (2005: 10). S/he has to decide whether the wanted translation is possible in the first place, and how it will be best accomplished. In other words, in the end it is the translator who is responsible for the fine details of the skopos.

With the help of the skopos theory it is possible to define the translation task precisely. The loyalty-principle is useful in translation as well – trying to achieve equivalence does not always work or is not meaningful, and Nord's model presents a way to avoid the problems striving for equivalence may bring. It must be remembered, however, that aiming for equivalence can also be the skopos of the translation.

Skopos theory provides a clear background for my study. It gives me the means to approach the translation task and a consistent way to handle the different problems I face in the translation process. Usually, when the translator is given a translation task, the initiator also gives him/her instructions for it in the translation brief, and can define very specifically what the translation is supposed to be like. These instructions can include things like the recipient, medium, time and place of and motive for, communication and the intended functions of the target text, and the skopos is based on them (Nord 1991: 93). However, in this research, I will have to define the translation brief and determine the skopos myself.

To determine the skopos, one has to first determine the functions of the source text, its most important characteristics and effects, and then decide what is expected from the target text, what it is supposed to be like. The skopos is based on all the information derived from these factors. As stated before, skopos means 'goal', and so the question exactly what is the aim of the translation is central to the specification process.

In determining the functions of the source texts one has to take into account the culture and time when they were written. Also, determining the target groups of the source texts helps to define the functions. Analysing the texts gives some knowledge of this: what kind of people the texts appear to be written for. Also the medium in which the texts were originally published – a 1940's science fiction magazine in my case – helps to determine the target group. To further analyse all the factors of both the source and target texts I will use Nord's text analysis model, which is presented in the next chapter.

2.2 Translation-Oriented Text Analysis

Christiane Nord (2005) describes in her book *Text Analysis in Translation* a model for translation-oriented text analysis that I will be using in this study to analyse those features of the source texts and the target texts that are most central to the translation. Nord's model describes the translation process and suggests tools for discussing and describing the translation of the source texts of this study.

Nord uses a so-called looping model to describe the translation process. In it, the first step is to define what the desired target text is like, in other words, to define the target text skopos. The second step is the source text analysis where the functions of the source text are examined. Here the translator first of all ascertains that the material provided by the source text is compatible with the requirements of the translation brief. The translator analyses all the ranks of the text to find the elements that are important for the production of the target text, in other words those elements in the text that according to the target text skopos are central for achieving the goal of the translation. After the source text analysis is finished, these translation-relevant source text features are matched with the corresponding target text elements with the help of the skopos. The final structuring of the target text is the last step, closing the circle. (Nord 2005: 36-37.) This is why the model is called looping model: it starts from the end, from the target text, and then, via the source text analysis, returns to the starting point. There are also other small 'loops' in the translation process, because all the time "the translator 'looks back' on things already analysed, and every piece of knowledge gained in the course of

the process of analysis and comprehension may be confirmed or corrected by later findings" (Nord 2005: 38-39). Nord (1994: 108) has summarized this process as follows:

- Analysis of the skopos based on the given instructions. Definition of the translation task.
- Analysis of the source text, starting from the source culture elements. The functions of the source text are determined.
- Comparison of the functions of the source text and the target text, and determining their relationship.
- Sketching out the translation strategy, i.e. those procedures that are needed to convert the elements of the source culture into functional target culture elements.
- Synthesis of the target culture elements: the translation.
- Checking the functionality of the translation by comparing it to the skopos.

Nord (2005: 41, 158) uses the following chain of WH-questions both to analyse the source texts and the target texts, and to formalize the translation instructions on which the skopos is based.

Who	*On what subject matter*
transmits	does s/he say
to whom	*what*
what for	*(what not)*
by which medium	*in which order*
where	*using which non-verbal elements*
when	*in which words*
why	*in what kind of sentences*
a text	*in which tone*
with what function?	*to what effect?*

These are the questions she considers important for the translation, and which the translator should consider beforehand. Later she analyses these questions in the form of extratextual factors and intratextual factors (Nord 2005: 160). In the list above, the extratextual factors are given in the left column, and the intratextual factors in the right. With the help these factors she carries out the three phases of her model for the translation process: analysis of the source text, comparison of the functions, and outlining of the translation strategy.

The extratextual factors enquire about the sender of the text in question (who?), the sender's intention (what for?), the audience to whom the text is directed (to whom?),

the medium or channel through which the text is communicated (by which medium?), the place and time of the text production and reception (where and when), and finally, the motive (why?) and the function the text aims to achieve (with what function?).

The intratextual factors enquire about the subject matter of the text (on what subject matter?), the information or content presented by the text (what?), the things the author presupposes the audience knows (what not?), the composition or construction of the text (in which order?), the non-linguistic or paralinguistic elements in the texts (using which non-verbal elements?), the lexical characteristics (in which words?), syntactic structures of the text (in what kind of sentences?), and the suprasegmental features of intonation and prosody (in which tone?). (Nord 2005: 42.)

The extratextual factors are analysed before reading the text. Based on them the readers build up certain expectations as to the intratextual characteristics of the text. The effect of the text is created when the reader compares these expectations to the actual intratextual factors of the text. So, the last question of the list (to what effect?) refers to "a global or holistic concept, which comprises the interdependence or interplay of extratextual and intratextual factors" (Nord 2005: 42).

Nord (2005: 160) also presents a table for carrying out the analysis of these factors. In addition to the extratextual and intratextual factors for the source and the target texts, the table contains also a transfer column which lists all the things that must be done to transfer the source text features to the target text. This table presents all the information about the source and target texts in a simple form, and even though all the factors are not that essential for all translations, the table helps to figure out which of them are more important than others. The table used for this study is on page 36 (Table 4).

I will use the model Nord presents in my study as it provides clear and systematic means for analysis. After I have determined the skopos of the translations I fill out the table, which helps me to see exactly what needs to be done to achieve the wanted skopos. I find this method quite clear and helpful, as examining the factors of the texts gives a convenient way to examine both the source and target texts, taking in account all the central things that have an effect on the texts being what they are.

In the next chapter I will discuss the translation of scientific and technological texts, as this forms an essential part of translating science fiction.

2.3 Translating Science and Technology

Joseph E. Patrouch (1974: xv) defines science fiction as "that fiction which examines scientifically plausible alternate settings for human consciousness." "Scientifically plausible" is the keyword here. Science fiction stories are often full of accounts of scientific phenomena, and science fiction authors use a great deal of technical vocabulary. To keep the plausibility in the translations, all science must be translated accurately and in a convincing way. In this sense, the science fiction translator faces similar problems as the translator of scientific texts – s/he has to be able to distinguish science from fiction and to translate it all so that plausibility is preserved. Since the problems related to the translation of scientific and technological terms form the basis of my study, I focus here briefly on scientific and technical translation – the problems, guidelines, and research related to it.

Translation in itself is an ancient procedure. It is not known when it began, but the oldest documents about translation come from 3000 BC (Vehmas-Lehto 1999: 21). Scientific translation as well has very long roots. As long as there has been science, there has also been a need to translate scientific works into other languages, and different translations between languages have played an important role in the development of science. The translation of Greek and Latin philosophical and scientific works into Arabic is one example of this. Not only did this introduce the Greek and Latin texts to the Islamic world and thinkers, but it also preserved them so that they could later be reintroduced to Europe – where many of the original works were lost – which in turn was crucial to the Renaissance. (Cf. Montgomery, 2000).

Translation is never completely problem-free, but scientific translation has many problems of its own. When translating into a target language of a developing country the translator has to come up with new expressions to describe scientific or technological phenomena, or when translating for example an advanced study of physics the translator faces the problem of having to fill in many things by him/herself, which is not always simple. For example "an article on electron levels in metal lattices might, but won't,

refer the reader to a textbook chapter on valence, a standard work on spectroscopy, and the author's previous work on crystals" (Teague, 1998). The lack of background information means that the translator himself has to have a good understanding of the subject of the translated text.

According to Palomäki (2004: 22), the most important characteristic that is required of a translator is the excellent command of his/her mother tongue. The translator has to master nearly everything of the language, from idioms and sayings to genres and orthography. According to Al-Hassnawi (n.d.), London Institute of Linguistics lists the requirements for a scientific translator as follows:

1. broad knowledge of the subject-matter of the text to be translated
2. a well-developed imagination that enables the translator to visualize the equipment or process being described
3. intelligence, to be able to fill in the missing links in the original text
4. a sense of discrimination, to be able to choose the most suitable equivalent term from the literature of the field or from dictionaries
5. the ability to use one's own language with clarity, conciseness and precision
6. practical experience in translating from related fields

In other words, the main requirement for a scientific translator is that s/he has to be an expert in the field of the translated text. In the end, many of the points above are related to this: if one is an expert in his field, it is easier to visualize the process and to fill in the missing links, as well as to choose the right terms. Briefly put, a scientific translator has to be a scientist, a linguist and a writer.

Scientific discourse is often seen as universal, and so its transfer into other languages is counted as an unimportant literary event (Montgomery 2000: 253). This can be seen, for example, in Beryl Sandlund's (2004: 95) comment "science and technology, especially in today's world, is to some extent global," in which she gives the impression that because of this, translating technological texts is simpler than translating legal texts. This kind of thinking can be proved inaccurate very easily. Even the mathematical texts that, by the nature of the symbolic system that is involved, appear quite 'universal,' need the explanations in written language so that the code can be understood correctly (Montgomery 2000: 255). Moreover, even though the terminology might appear

universal, without specific knowledge of the field a translator is not even capable of recognizing the ‘global’ parts.

Knowing the correct terms and nomenclature is not the only problem a scientific translator faces; s/he has to also be familiar with the style that is accepted for scientific discourse in the target language. Scientific style is hardly as universal as one might assume. Even in the same language there can be local differences: a chemical writing from India differs in many ways from those published in Britain (Montgomery 2000: 258). The stylistic differences are also clear for example between English and French. In English scientific texts the intent is “to convey the maximum amount of technical matter with a minimum of style” while the French texts tend to have more literary qualities (Montgomery 2000: 265). Scientific style will be discussed further in chapter 2.5.

The different problems related to translating scientific and literary texts are portrayed in the differences between these fields shown in Table 1 (Al-Hassnawi n.d.).

Table 1. Science vs. literature

Science	**Literature**
- Denotative adequacy.	- Unbridled connotation.
- Logical expository and/or argumentative progression.	- Lack of argumentative progression.
- Precision.	- Vagueness.
- Intellect.	- Imagination or intuition.
- Reason.	- Emotion.
- Truth to particular truth.	- Truth to the ideal and universal.

Scientific texts and literary (fictional) texts are in some ways quite contrary genres. The keywords in scientific writing are reason and intellect, in literature emotion and imagination. In scientific texts, the subject matter takes priority over style. These texts are not read for pleasure, unlike literary texts. Literary texts can attempt at having an emotional effect on the reader and they are not required to have any points of argumentation, while scientific texts tend to be dryer, non-emotional, and they are based on intellect and precise facts, usually arguing for some points. There are few or no wordplays or metaphors in scientific texts – these belong to the literary field – on the contrary, scientific texts try to be as precise as possible, since they cannot be open to

various interpretations, while a certain kind of vagueness can be a literary device. All the words in scientific texts have precise denotations, whereas literary texts can play with the different connotations of words. All in all, scientific texts have an informative role and they are more tightly bound to certain norms, while literary texts' main purpose is to entertain, and they are freer to take liberties. All of these points can naturally be applied also to the translation of scientific and technical texts.

Scientific translation is a field of its own, and a scientific translator must have specific skills to successfully complete the translations. Besides the usual requirements, the translator must be an expert in the subject of the translated text, and s/he has to be familiar with the conventions of writing scientific texts in the target language. The translation of scientific texts is supposed to be more direct, freer from alternatives, and much less artistic than the other kinds of prose. The characteristics of a scientific or technical text are impersonal style, simpler syntax, and clarity.

2.4 Translating Science Fiction

> What can you believe and what must you disbelieve? It is not uncommon to say the hell with it and deny credence to the whole structure. But such a decision changes the science and technology translator to a science-*fiction* translator, and everybody knows it is nearly impossible to translate science fiction. (Teague 1998.)

Translating science fiction is a combination of scientific and literary translation. A science fiction book, being a work of imagination, falls into the category of literary texts, but at the same time it also has characteristics of a scientific text. As all fiction, science fiction stories are imaginative, emotional, and non-informative, but there are parts in them, which can be pure science, for example specific explanations of different scientific phenomena or descriptions of the conditions on some alien planet or of some imaginary machinery. Also, even everyday conversations in science fiction stories can use some scientific or technical vocabulary.

Translating science fiction has problems of its own when compared to other kinds of fiction. Some of these problems include the invented words, languages and place names, and the different worldview – or even the completely different world – of the original text that have to be conveyed plausibly in the translation (MacLean 1997: 13-14). Moreover, science fiction often uses "highly technical vocabulary sets related to

ground-breaking technology, or technology which doesn't even exist yet and where, therefore, no parallel texts can be used to cross-verify meaning or terminology" (MacLean 1997: 14).

Because of this, the science fiction translator is at times in a somewhat similar position as a translator who works into a language that does not yet have a scientific vocabulary: the neologisms that the author has created require new expressions into the target language. Besides the invented words and languages, the translator also has to decide how to treat the character and place names (MacLean 1997: 14). In this sense, imagination, which plays an important role in translating any fiction, is especially crucial when translating science fiction.

A science fiction translator faces similar problems as both the scientific translator and the fiction translator – problems that are related, on the other hand, to the suitable ways to convey the imaginative and emotive characteristics of fictive texts, as well as their wide range of possible stylistic choices, and on the other to the correct terminology choices and the restricted style of science. The abundance of the invented science and culture in science fiction, as well as the way they are intertwined with real science, poses additional challenges for the translator. In the following I will look more closely on neologisms and on the earlier studies of this field.

2.4.1 Neologisms

Peter Newmark (1988: 140) defines neologisms as "newly coined lexical units or existing lexical units that acquire a new sense." Neologisms are common in languages, so common that according to Newmark (ibid.) each language acquires about 3000 new words annually. Science and technology produce many neologisms, contributing large numbers of new terms to the general vocabulary (van Dyke 1992: 383). In 1982 C. Barnhart, a dictionary editor, stated that almost half of the new words in his dictionary supplement were scientific and technical terms (van Dyke 1992: 383).

In general, there are neologisms of different kinds: some of them come into the mainstream of language from sciences, slang and dialects, some are loan words from other languages. Of course, it is not always quite clear what is a neologism and what not.

According to Cabré (1999: 205), there are four different ways to determine if a unit is a neologism:

a) Diachrony: a unit is a neologism if it has arisen recently
b) Lexicography: a unit is a neologism if it is not in dictionaries
c) Systematic instability: a unit is a neologism if it exhibits signs of formal instability (e.g. morphological, graphic, phonetic) or semantic instability
d) Psychology: a unit is a neologism if speakers perceive it as a new unit

In the case of my study b) is the most reliable definition, though d) is my starting point – what I perceive as neologism. As for a) and c), they do not quite apply to my case. First of all, the articles were published half a century ago, so the neologisms are hardly recent, and moreover, they appear only a few times in the articles, and hardly show any instability.

Newmark (1988: 140-150) proposes many different types of neologisms: old words with new senses, new coinages, derived words, abbreviations, collocations, eponyms, phrasal words, transferred words, acronyms, internationalisms (a loanword that occurs in several languages with the same or at least similar meaning and etymology), and pseudo-neologisms (a generic word that stands for a specific word). Cabré (1999: 207) has compressed these into four groups:

1. Neologisms in form, including the following structures: derivations (with prefixes and suffixes), compounds, phrases, and shortenings (using initials, acronyms, clippings)
2. Functional neologisms, including cases of lexicalization of an inflected form and those formed by syntactic conversion
3. Semantic neologisms, including three types of processes: broadening or narrowing or change of the meaning of the base form
4. Borrowed neologisms, which are true borrowings and loan translations

These two categorizations overlap in many parts. One central type of neologism which is missing from Cabré's list is Newmark's 'new coinage', that is, a word that is not in any way derived from any existing word. As Newmark (1988: 142) says, it is not common to have a word that would not in any way be based on some existing words, but even this happens at times. Otherwise, Cabré's first group includes Newmark's 'derived words', 'collocations', 'phrasal words', 'abbreviations' and 'acronyms', third group corresponds to 'old words with new senses', and fourth to 'transferred words'. The

second group seems to be missing from Newmark's definitions, but in some parts (syntactic conversion) it can be thought to be included in the ‘old words with new senses’ group.

Van Dyke (1992: 384) criticises these kinds of categorizations, saying that they are “poor systems for classifying new words.” As she points out, these lists do have certain shortcomings, one of them being that the categories are not mutually exclusive. In other words, many of the processes (shortening, affixation, compounding) can affect the same word simultaneously, and so the classifier must choose one ‘dominant’ process (ibid.). On the other hand, van Dyke (1992: 385) does not see the categories as sufficient, as there are words that do not match any of the categories, at least not well. As an example she gives words like *megaversity*, which shows affixation of a root that has been newly created by shortening, and *hologram*, which contains bound morphemes that may be borrowed but are combined in English, so that the term is neither a loanword nor an affixation.

In her own study, van Dyke uses two parallel sets of categories, one of which is based on form and the other on meaning (1992: 385). She calls these categories novelty of form and referential distance (1992: 388). The new words she classifies with the help of three questions. The first two questions deal with novelty: “how many of the term’s apparent root morphemes appear in a moderately complete contemporary dictionary” and “if any of the roots appear in OAD, do any or all of them also occur twenty times or more in the corpus of one million words used for Kucera and Francis (1967)”, where OAD refers to the *Oxford American Dictionary*. The third question (for referential distance) is “do the definitions of the term’s roots refer to its current field of meaning?” With the help of these questions she divides the terms in her study to different groups, varying from “No roots in the dictionary” and “Some roots in the dictionary but none in the high-frequency list & Roots’ definitions make no reference to term’s field” to “All roots in dictionary and all in high-frequency list & Roots’ definitions refer to term’s field” (van Dyke 1992: 388).

Van Dyke (1992: 384) examines modern scientific and technological word-formation in her study. Her aim is to show that “both the traditional impression that scientific and technical terms are particularly baffling and the suggestion . . . that such

terms arise from common roots and derivational processes" are true. What she finds out is that the most common group among scientific and technical neologisms are what she calls recycled terms, i.e. terms that come from roots not associated with their new fields (such as *dialect* in genetics and *virus* in computer science) and also terms that have no association with any particular subject area (*beam dump, critical path*) (1992: 391-392). Here "old and new meanings are joined by metaphor, metonymy, or specialization, but the relationships cannot be inferred from the terms themselves or from the definitions of their roots" (ibid). Of the terms in van Dyke's study, recycled terms constitute about 25% of the scientific and technological terms. In physics and computer science – fields that van Dyke notes respectively to be especially esoteric and new, respectively – the percentages are 35 and 53. (Van Dyke 1992: 392.)

Van Dyke's research deals only with the definition and nature of neologisms, not with their translation. According to Newmark (1988: 149), when translating a literary text, it is the translator's *duty* to recreate all neologisms on the basis of the source language neologisms. As Mäkelä (2003: 22) argues, the proper translation of neologisms is important, as this way the author's intended effects are preserved. However, with scientific texts, the translator should make sure that a translation does not already exist – especially in fast developing fields, such as computer science, it is not always easy to realize what is a neologism and what not. Cabré (1999: 120) adds that terminologists in general must be aware of the terminological policies set by standardizing and administrative organizations, and especially important this is with neologisms.

Newmark (1988: 150) lists several different methods to deal with neologisms in translations. The simplest way is transference, where the word is added to the translation as it is. If it is adjusted to the target language pronunciation and morphology the process is called naturalisation (Newmark 1988: 82). Calque, or loan translation, is a phrase borrowed from another language by literal word-for-word translation (Newmark 1988: 84). Other ways are to create a completely new, corresponding neologism (e.g. in the case of a word that arouses certain connotations) into the target language, or, in the case of a transparent neologism, the word can be translated literally or it can be derived from existing target language words. In some cases it might also be possible to combine different methods. (Newmark 1988: 150.)

In my discussion of the neologisms and their translation in the texts of this study I will use Newmark's definitions as guidelines, but also make use of van Dyke's novelty of form and referential distance. Newmark's categories are quite overarching, and even if there can be some neologisms that do not fit them, or that would fit more than one category, this is not a problem in my study. As it is not my purpose to divide the neologism into specific categories, but to use the categories to help to define the different kinds of neologisms, I can easily attach more than one category to one neologism, if needed, or then conclude that there is no category that would fit them, which also tells something about the neologism. Van Dyke's two categories add a new dimension to Newmark's definitions. I do not have a corpus to use in this study, but even the questions whether the word itself or any of its roots are found in a dictionary help to define the nature of the neologisms. I will also use Newmark's terminology when discussing the best ways to transfer the neologisms into Finnish.

2.4.2 Previous Research on Translating Science Fiction

There is very little research available about translating scientific and technological texts between English and Finnish. One reason for the lack of research is most probably the fact that English is the global language of science, and for example chemical articles are very seldom translated into Finnish. In fact, many Finnish researchers write their articles in English instead of Finnish to begin with. According to Palonen (2003: 11) the proportional figure in favour of English against Finnish in 2001 was 70:30. This estimate includes all academic writing – in natural sciences it is likely to be much higher (ibid.). For example according to a research by Skudlik (1992, cited in Palonen 2003: 10), in Germany the percentages show a clear dominance for English as the publishing language for natural sciences: 98% for physics and 83% for chemistry.

On translating science fiction from English to Finnish there is some previous research, but not much. For the most part these are different Master's Theses that treat the translation of neologisms (e.g. Mäkelä 2003; Piiparinen 1994). Piiparinen concentrated on translations of neologisms in the works of three different science fiction authors and her goal was to find regularities in the neologisms and the translation methods used by the translators, whereas Mäkelä examined his own translation process

and focused on long and complicated sentences and style in addition to neologisms. He does not present any translation guidelines, as he puts it, but states that in the translation of literary texts the translator has to balance between the style of the original text and the text's content and meaning. Most often style has to be given priority, but intelligibility and readability should not suffer over this. (Mäkelä 2003.)

Neologisms are the subject also in Heather MacLean's (1997) paper. She has examined them in translations between French and English. She used two short stories from 1970's and 1980's in her study, in which she concentrated on neologisms, technical vocabulary sets and poetic language, typography and layout. She presents different examples from the texts, explaining why different choices in the translations were made. In the end, she concludes that in general it is better to use more general words in translation instead of specific ones, as "this allows the reader the necessary flexibility in creating the textual world" (MacLean 1997: 17). If the world in the text is not identical with ours, the translator does not have the right to bias the reader to his or her interpretation of that world (ibid.). This is one of the differences between literary and scientific texts: the latter would try to be as specific as possible.

One thing that also MacLean emphasises is the importance of having scientific knowledge, so that the translator can choose the right terms to convey the "pseudo-advances in technology" that the author uses as a basis for his/her textual world (MacLean 1997: 17). Nevertheless, the translator also has to have skills to convey the literary parts of the text with the right "feel", especially when the text in question has, like MacLean's examples did, parts that are almost poetic (MacLean 1997: 17).

There are some other studies which in different ways combine translation and science fiction. Brian Mossop (1996) has examined translation *inside* science fiction stories, that is, how science fiction writers deal with the problems in communication with extraterrestrial beings. There are also studies about cultural effect of science fiction translations, for example the article by Jean-Marc Gouanvic (1997) about the effect American science fiction translations had in the post-war France. On the actual science and technology in the translation of science fiction stories there seems to be only little if no research.

For the most part, these studies deal with subjects that are not related to my study, with the exception of MacLean. Her study is in many ways similar to mine, even though the texts she uses are quite different from Asimov's Thiotimoline articles – they are much more literary, almost poetic pieces of work. Her thoughts on the nature of science fiction and also on its translation provide some useful insights, which will be discussed later.

It is also worth noting that there is very little research available of these particular Asimov short stories. What little there is will be discussed in chapter 4, but overall it can be said that this study counts among the first ones, even though Asimov in general has received much research attention during the past decades.

2.5 Scientific Style

Stereotypically, scientific texts are often considered to be quite complicated, dry, impersonal, stiff and abstract (Luukka 2002: 17). What comes to the artistic qualities and enjoyment, scientific style does not score very highly, but then again, this is not the goal of scientific texts either. As scientific style has an important part in creating the effect in the Thiotimoline articles, I will discuss it briefly here.

As has been stated before, there can be considerable differences between what is considered proper scientific style in different countries. English and Finnish are in this sense a relatively easy combination, since there are not many differences in the styles used. One feature of the scientific style is the use of either first person plural or impersonal constructions (Nord 2005: 206), which is common both in English and Finnish. English texts can also use "the author" to refer to the writer of the text (ibid.) whereas in Finnish, this sounds a little archaic. The use of tenses is also similar, present tense being used to separate the commenting passages from the narration (Nord 2005: 207).

The differences between technical language and standard language are also quite similar in Finnish and English. In technical language the syntax is different, consisting for the most part of argumentative sentences, the most common tense is present tense and the copula is used often, and the language uses specific expressions that are full of nouns (Yli-Jokipii 2004: 84). The most noticeable differences between technical and

standard languages are, of course, in vocabulary. Technical and scientific texts are full of words that do not belong to the standard language, or that have different meanings than in everyday life (for example, *mouse* and *window*) (Yli-Jokipii, 2004: 85).

There is much information about the characteristics of English, based on large corpora (for example Biber 1988, 1995). Of Finnish there is much less information available. Luukka (2002: 17) lists some characteristics of scientific Finnish. Typically it uses abstract and static verbs (esittää, osoittaa, tarkoittaa), adjectives for objective properties (ensimmäinen, mahdollinen, yleinen) abstract nouns (asia, osa, tapa, tulos, yhteys), indefinite and abstract pronouns (muu, sama, jokin, eräs), and introductory and analysing adverbs (tai, kuten, yleensä, kuitenkin). For example David Oakley's study (2002: 120) shows that in technological texts English as well uses similar verbs (some examples concerning verbs that he mentions: assume, show, suggest).

Biber (1988) has examined various text types of English (both written and spoken) based on corpora, to define their distinctive features. One of these text types is academic prose and its subgenres natural sciences and technology/engineering. One of his findings is that academic prose (together with official documents) is far more abstract in its language than other text types in his study – press reportage, religious texts, fiction and conversations, among others (Biber 1988: 151) – and among these, technology/engineering and natural sciences score highest (Biber 1988: 189). As for the other factors he examined, all academic prose is characterized by highly informational purposes, with natural sciences leading the way, which means that the texts have frequent nouns, prepositions, attributive adjectives, long words, and high lexical variety (Biber 1988: 193). On the other hand, he says about technical texts that "abstract technical discourse, marked by frequent use of passives and conjuncts, has a relatively low lexical variety compared to other types of informational discourse" (Biber 1988: 112). He states that technical discourse, apparently, uses a small set of precise technical vocabulary to refer to exact concepts and entities (ibid.). Moreover, Biber's results show that especially technology/engineering and to some extent also natural sciences texts do not use narrative as means of expression (Biber 1988: 193).

All these findings of Biber's research seem to apply to Finnish as well as to English. Finnish academic texts are just as abstract and informational, they strive to

deliver scientifically acquired information and do it with the help of conceptualisations. The texts tend to have a large number of definitions, and they are abstract and conceptual, but as Luukka (2002: 18) argues, this is because the point of view research has towards the surrounding world is abstract and conceptualising, not because it wishes to present things in a complicated way.

It is also worth noting that if there are differences between countries, there are also differences between different time periods. Asimov wrote his Thiotimoline articles over fifty years ago, and the language and style of the articles reflect this time. Nowadays, attitudes towards scientific style are not as harsh. As Luukka (2002: 21) puts it, even though the goal in scientific writing is to be objective and keep to the point, the author does not have to avoid referring to himself/herself completely. In other words, writing in the passive voice and using periphrasis is not absolutely necessary. Still, as Table 3 (p. 32) will show us, Asimov uses consistently passive voice both in his dissertation and the Thiotimoline articles. Keeping in mind the humorous character of the articles, it is quite likely that Asimov deliberately parodies also the scientific style in them, i.e. is purposefully writing in a way that makes them skim bottom on any "reading ease scale", as Goble (1972: 52) puts it. In the following I will discuss Asimov further, both his life and works.

3 ISAAC ASIMOV AND HIS WORKS

3.1 Asimov's Life

Isaac Asimov (1920–1992) was born in Petrovichi, U.S.S.R. When he was three years old, his family moved to United States. He studied chemistry at Colombia's graduate school, earned his M.A. in 1941 and doctorate in 1948, but he had been interested about writing already as a child. He started writing in the 1930's, and after some rejections, his first story was published in a magazine called *Astounding Science Fiction* in 1939. (Patrouch 1974: xxv.)

Asimov's career can be divided into several time periods, but in general, from 1939 until 1958 when he published *The Naked Sun* he wrote mainly science fiction, and during this period he established his reputation in that field (Patrouch 1974: xxv). In the 1940's it was not unreasonable to say that "Asimov is science fiction" (Patrouch 1974: xxiv), even though there were other great names in the field: "In a field now swollen with success stories, major writers, and significant innovators, Heinlein still stands out along with Isaac Asimov and Arthur C. Clarke as first among giants . . ." (Landon 2002: 39). During the next quarter of a century, Asimov published only four science fiction stories and concentrated on non-fiction, mainly popular science. From the early 1980's he returned to science fiction and wrote many sequels to his existing novels. (Isaac Asimov Home Page, n.d.)

In the field of science fiction Asimov became famous especially for his robot stories. His first robot story was published in 1940, and the first robot collection, *I, Robot*, came out in 1950. His robot stories reflect the change that was taking place in science fiction in 1940's. At that time, the fiction was beginning to portray science and scientists as they really were, or might some day be (Gunn 1982: 52-53). The Foundation series (1942–1991) is another of his most famous works.

Asimov was by his nature not very active socially. He was uneasy with strangers, as well as with women, even though with time he learned to scope better socially. In relation to women he adopted a flirtatious attitude, an "all-embracing suavity" as he calls it, by which he means that "he is willing to embrace any female within range and usually does" (Gunn 1982: 23-24). This is easy to believe when reading his interviews made in presence of women. For example, when he is talking about his love for writing, he tells how he was once asked what he would do if he would have to choose between writing and girls. His answer was that he is able to *write* twelve hours without a pause (Artimo 1987: 76). Sometimes this attitude leeks into his writings as well – not into the writings of more serious kind, but in "The Micropsychiatric Applications of Thiotimoline" there are some puns aimed also at the differences between the two sexes.

3.2 Asimov's Science Fiction

The foundations of science fiction were based on the science fiction magazines created by various entrepreneurs from the 1920's to 1950's (Gunn 1982: 27). It is no wonder then that also Asimov started his writing career submitting stories for these magazines, mostly for *Astounding Science Fiction*, a magazine whose editor was John Campbell. Campbell had a powerful effect on Asimov's career, both because of the support and the criticism he offered. Asimov was the first to admit this: "I probably bore everybody with my endless repetition of how much I owe to John Campbell, because I figure I would rather bore them than be disloyal in my own mind" (Gunn 1982: 20). Campbell's opinions formed the stories also in other ways. Asimov has, for example, told that the reason for him creating a humans-only galaxy in his writings was that Campbell was of the opinion that humans should, naturally, be in every way superior to the aliens, a view that Asimov did not share, and so he decided to avoid that clash by leaving all aliens out (Artimo 1987: 76).

Since the time Asimov started writing, the term "Asimovian" (and sometimes, also, Campbellian) has become common when describing certain kind of science fiction. Patrouch (1974: 255) gives in his book *The Science Fiction of Isaac Asimov* an account of exactly what he means by that term. He starts by describing Asimov's style: short and clear sentences, which, if they gain length, gain it not from dependent clauses, but by addition of other simple sentences: not "The boy who hit the ball ran around the bases," but "The boy hit the ball, and then he ran around the bases." Asimov almost never uses images, metaphors or similes, as he does not seem to like figurative language at all. As Patrouch puts it, one does not "notice" Asimov's language, and so "Lovers of language will say that he is no stylist, lovers of communication will admire and envy him." In short, Asimov has a very simple, communicative style, which the science fiction writers in general aspired for during the 1940's. (Patrouch 1974: 255.)

Asimov's stories take place in the immediate and distant future. In general, his backgrounds are quite meticulous and, as everything else, scientifically accurate, but unfortunately his characters are not quite as convincing. As Patrouch (1974: 257) puts it, one leaves an Asimov story with the feeling of having lived for a while somewhere else,

but not with the feeling of having lived with real people. “They are not people,” says Patrouch (1974: 258), “they are story parts.”

When thinking about these characteristics of an Asimovian story one cannot help forming the conclusion that these stories are written by a scientist. The clear style which avoids figurative images and the focus the stories have on describing all places accurately while the people are left for what they are, all bring to mind rather scientific articles than fictional stories. As James Gunn (1982: 21-22) argues, the characteristic that made Asimov’s books so typically Asimovian was their rationality, and as his writing improved, the quality of problem solving became characteristic of his later work. Rationality was important for Asimov. In Gunn (1982: 25) he says that

> In my public statements I have to deal with the world as it is – which is the world in which irrationality is predominant; whereas in my fiction I create a world and in my world, my created world, things are rational. Even the villains, the supposed villains, are villainous for rational reasons. . . .
> Science fiction in its very nature is intended to appeal a) to people who value reason and b) to people who form a small minority in a world that doesn’t value reason. . . . I *am* trying to lead a life of reason in an emotional world.

Asimov did take science quite seriously in his writings. As he listed his favourite science fiction writers, his main criterion was that they had to “know their science**”** (Wojtowicz 1988). Once in 1971 he was attending a science fiction convention where Robert Silverberg, himself a famous science fiction author, made a reference to plutonium-186. In the audience Asimov laughed because he knew that this was an impossible isotope. Still, the friendly banter between him and Silverberg made him to promise he would nevertheless write a story about it. This resulted in his first science fiction novel in fourteen years, *The Gods Themselves*. (Gunn 1982: 186-187). It is clear that Asimov did not ban ‘pure science fiction’ from his writings, imaginary science in which he did not believe, but it can be pointed out that also in *The Gods Themselves* he made sure there was a careful explanation how such an impossible substance could appear in our universe. When Asimov was asked what he thinks is the most difficult barrier to overcome in figuring out the methods of interstellar travel, his answer was “the most insurmountable is the speed of light limit”. As the interviewer pointed out that in

his books people are travelling faster than light, he said, “That's true! But that's in the novel. You must never confuse your dreams with reality.” (Wojtowicz 1988.)

Also the articles that are used in this study make it clear that Asimov did not always take science seriously in his science fiction; in fact, he is actually making fun of science in them. Still, I would say that he had a very serious attitude towards real science: it is all right to have fun with science as long as you know what you are doing, and have the basics right. Factual errors or things based on nothing he would not have tolerated. These things are something also the translator has to take into consideration. Asimov’s nature makes the made-up science to interweave even more tightly than normally with real science – everything has its roots in reality. The translator must be careful not to confuse the facts with fiction.

4 THE SOURCE TEXTS

The stories I have chosen for my study, “The Endochronic Properties of Resublimated Thiotimoline” (first published in *Astounding Science Fiction*, 1948) and “The Micropsychiatric Applications of Thiotimoline” (first published in *Astounding Science Fiction*, 1953), represent Asimov’s early production. The reason I have chosen these two stories for my thesis is that they, by their very nature, provide more relevant material (i.e. scientific terminology and neologisms) than other Asimov’s short stories, and also, I find this kind of fiction/non-fiction mixture interesting. In this chapter I discuss these stories and take a look on the earlier research written about them.

Over half a century has passed since Asimov wrote the Thiotimoline articles, and many things have changed in that time in the science fiction fandom. At the time Asimov started reading – and also writing – science fiction, the number of science fiction readers was very small (Gunn 1982: 18), and the difference is still huge when we compare today’s numbers to 1940’s, when Asimov established his fame. Moreover, when Asimov wrote the short stories he was still quite young and not the world-famous writer he is today. His works are nowadays likely to be picked up by people who would not have read them in the 1940’s.

Asimov's Thiotimoline articles are quite peculiar science fiction. They are, as Asimov himself said, a work of fantasy, but written in a non-fiction form (Asimov, 1973: 474). They are chemical articles about an imaginary substance, thiotimoline. Asimov got the inspiration for this story as he was working on his Ph.D. research and dissolving a compound called catechol in water. In the process it occurred to him that if catechol were any more soluble than it was, it would dissolve before it was added to water (Asimov, 1973: 465). Exactly this is the unique property of thiotimoline.

By the time Asimov wrote the first thiotimoline story he had been writing prose for nine years, and he was afraid this might have impaired his ability to write the prose that was typical of academic discourse, and so he decided to practice with a spoof article. As he self put it: "I rather dreaded [writing the dissertation], since the obligatory style of dissertations is turgid in the extreme, and I had by now spent nine years trying to write well and was afraid I simply might not be able to write badly enough to qualify my degree" (Asimov 1973: 464). In reality, he did not seem to exaggerate when he talked about the turgidity of dissertations. Taking a look at the title of his thesis gives a good picture of the language used. Asimov himself said that it is "even more ridiculous than the one I plastered on the first Thiotimoline article": *Kinetics of the Reaction Inactivation of Tyrosinase During Its Catalysis of the Aerobic Oxidation of Catechol* (Goble 1972: 52).

Asimov did quite well with this practice; he certainly wrote it "badly enough." There was a surprising number of people who took the article for real. Asimov was told that in the weeks after its publication the librarians at the New York Public Library were "driven out of their minds by hordes of eager youngsters" who wanted to see the fake journals he had used as pseudo references (Asimov, 1973: 474). Besides the youngsters, the story also took fire also among the chemists. After its publication copies of it started circulating the chemistry department, passing from chemist to chemist, and most probably it is especially chemists who enjoy it the most even today.

It is quite interesting to note how little attention these studies have got in Asimovian research. Joseph E. Patrouch (1974: vii) states that one goal for his book *The Science Fiction of Isaac Asimov* is to "analyze as much of that science fiction as possible", but in the end he does not even mention the existence of these Thiotimoline

articles. James Gunn does a little better in this regard. He tells us that Asimov wrote "The Endochronic Properties of Resublimated Thiotimoline" in 1948, and that "it was important to his future career" (Gunn 1982: 90). Exactly why it was important he fails to say. Most likely he means the story's significance in the sense that it was the first that made Asimov famous, even though not yet world-famous. As Asimov says, "people who had never heard of me at all as a science fiction writer heard of thiotimoline" (Asimov 1973: 474). Olander and Greenberg (1977: 61) point out another way the Thiotimoline articles were important: they contributed to the "idea pool or the language stock of science fiction".

Neil Goble (1972: 54) presents short samples from both Thiotimoline articles and Asimov's dissertation for comparison. All three samples consist of a couple of complex, long sentences, which are, one could say, stereotypical examples of the language of scientific texts. Goble (ibid.) states that "I personally wonder whether Asimov would have had the stomach to write his real thesis in the language he did, if he had not purged himself first with the parody," and he continues saying that Asimov was proud of these parodies, perhaps even prouder than of the "real thing". This sounds likely, if one keeps in mind that Asimov called them his first pieces of non-fiction, whereas of his dissertation and some other early, strictly scientific papers he says: "I don't count these papers as my earliest non-fiction . . . they weren't written in my capacity as a writer. They were concomitant of my role as a scientist, and nothing more – like dropping beakers" (Goble 1972: 54).

Goble (1972: 46, 53, 80) presents also some tables with statistical information about the articles as well as about other Asimov's stories. Here I have combined the information of the Thiotimoline articles, the dissertation (of which Goble analysed only the summary), and the science fiction stories in Tables 2 and 3. Table 2 examines the writings in terms of average sentence and paragraph length, and the amount of syllables, personal words and personal sentences. As personal words Goble (1972: 42) counts words like "people" and "folks", proper names, and all pronouns that refer to them. Personal sentences include "all dialogue, any sentence fragments, all questions, commands, and exclamations, and any other sentences that directly involve the reader" (Goble 1972: 43).

Table 2. Statistic summary of Asimov's dissertations and science fiction I (Goble 1972)

	AVER. SENT.	**AVER. PARA.**	**SYLL-ABLES**	**PERS. WORDS**	**PERS. SENT.**
Dissertation	29.9	97	196	0	0
Thiotimoline	26.8	90	180	1.1%	0
Science Fiction	10.6	27	142	12.7%	66%

Table 3 presents the information about Asimov's use of different persons and voice (in which the active, passive, and intransitive verbs are separate categories), as well as the structure of sentences (simple, compound, or complex) and their type declarative, interrogative, imperative, or something else.)

Table 3. Statistic summary of Asimov's dissertations and science fiction II (Goble 1972)

	PERSON			**VOICE**			**STRUCTURE**			**TYPE**			
	1st	**2nd**	**3rd**	**Act**	**Pass**	**Int**	**Smpl**	**Cpnd**	**Cplx**	**Dec**	**Qst**	**Imp**	**Etc**
Dissertations (inc. thiotimoline)	0	0	100	2	63	35	0	0	100	100	0	0	0
Science Fiction	17	13	70	34	10	56	58	14	28	72	9	7	12

The tables clearly show the differences between Asimov's scientific and literary styles. Table 2 shows that the average sentence length is almost three times longer in the dissertations than in normal science fiction, and the paragraph length even longer. Personal words and sentences are almost completely missing. Table 3 shows that the dissertations use only the 3rd person. The passive voice is the most common in dissertations, while in science fiction only ten percent of sentences use it. Sentences of the dissertations are 100 per cent complex and declarative. The differences between the dissertation and the Thiotimoline articles are small, on the other hand. Still, as can be seen in Table 2, the articles are just a little closer to general science fiction in every regard.

Besides Goble, I have not found more research about the Thiotimoline articles. The lack of attention these texts have received most likely reflects their position in science fiction. They represent a curious sub-genre which does not have a large audience, and even in Isaac Asimov's work they are peculiarities: something that does not fit completely into his regular science fiction, but that definitely cannot be counted as non-fiction either. Heather MacLean (1997: 13) discusses a certain kind of science fiction which she calls simply SF (she uses this term also to refer to science fantasy and speculative fiction) to differentiate it from sci-fi. It is literature which often is difficult to read and understand, and which is rarely popular: "*Star wars* and *Star Trek* are sci-fi; *2001* is SF" (ibid.).

MacLean (1997: 13) argues that SF differs from fiction in that it requires the presence of three elements: novum, cognition, and distanciation. Novum is defined as a "hegemonic literary device of a locus and/or dramatis personae that . . . are radically or at least significantly different from the empirical times, places, and characters of 'mimetic' or 'naturalist' fiction" – in other words, something that is different enough from the reader's physical world to stand out. However, it is possible for a text to have a novum and still not be a piece of SF. Cognition is what allows us to distinguish other surrealistic texts from SF: it is a thought process based on the contemporary definition of cause and effect; that is, there has to be some kind of an explanation for the novum, something that makes it normal and possible in the world the text describes. Distanciation is the effect produced by the novum and cognition that allows the reader to reflect upon the implications of the text that are relevant to the reader's own world. (MacLean 1997: 13.)

The Thiotimoline articles are quite different from MacLean's example, Arthur C. Clarke's *2001*, but still they fit the description quite well. They are not popular, nor easy to read, and they have all the elements described above: a compound which dissolves before the water is added into it, scientific explanation of how and why this happens, and, finally, there is the way especially the first of these articles clearly makes fun of the contemporary Soviet science, parodying the ridiculous research results that were seriously presented by Soviet scientists like Trofim Lysenko.

In the next chapter I will move on to analysing the texts with Nord's model of translation-oriented text analysis, presented in chapter 2.2, and define their skopos and the translation strategy I use.

5 ANALYSING THE SKOPOS AND THE TEXTS

In this chapter I will first discuss and define the skopos of the translations, based on my own conclusions about what is central in them. I will also analyse the source and target texts using Christiane Nord's text analysis method. The translation strategy for the source texts of this study will be defined on the basis of the skopos and the analysis.

5.1 Determining the Skopos

In a normal case the skopos of the target text is based on the instructions the initiator gives for the translation, on the so-called translation brief. As stated before, I do not have any outside initiator for these translations, so I lack this brief. Therefore I will have to try to make one for myself, based on what I imagine would be a possible brief handed by an initiator.

One thing that affects the skopos is the medium of the translation. The most likely medium for a translated science fiction short story would be either a science fiction anthology or magazine, which is the same as the medium for the original articles. The texts for this study are not, of course, very typical science fiction stories, being fake articles, but most likely the medium for them would still be the same.

In scientific texts, strict equivalence is important. If one is translating for example a paper of physics into another language, the most important thing is to keep the terms intact, and not to take any liberties concerning them. In science fiction, the situation is different. The exact terms do not matter that much anymore when we are talking about made-up science; the effect on the reader is the most important thing. Of course it has to be remembered that, especially since we are talking about stories that are written by a classic science fiction author who was also a scientist, all inaccuracies concerning real science can be very annoying and irritating to a reader who is an expert

on these fields. Moreover, while the source texts were not different from other contemporary science fiction texts when they were written, nowadays they are regarded as interesting examples of early Asimov.

The main point in these texts is the way they look exactly like real scientific articles, real enough to the layman's eye to be mistaken for true science. For those who know chemistry and physics, they are highly amusing texts. It is this effect the texts have that appears to be their most important element, and the aim of the translations should be to preserve it. So, the main task is to translate the texts as fluent Finnish science fiction stories, keeping intact their entertaining "real science" effect; in other words, preserving the effect of the texts – i.e. making them such that they could be passed for real articles – forms the skopos for these translations.

5.2 Analysing the Source and Target Texts

Christiane Nord (2005: 42) lists several factors, divided into extratextual and intratextual, that the translator has to take into consideration before making a translation. These factors were presented in chapter 2.2, and for this study they are further analysed in Table 4. This is the table Nord (2005: 160) presents for the analysis of source and target texts. The left column is first filled with the source-text elements, after which the corresponding target-text elements are added to the right column. On the basis of this information the translator decides how to transfer the source-text elements into the target text: this information is added in the middle column.

Because the texts used in this study are quite similar, I decided to make only one table instead of discussing both articles in tables of their own. If there is need to separate the articles, number one refers to "The Endochronic Properties of Resublimated Thiotimoline" and number two to "The Micropsychiatric Applications of Thiotimoline."

Table 4. Source-text analysis and target-text profile.

	SOURCE-TEXT ANALYSIS	TRANSFER	TARGET-TEXT ANALYSIS
	A. Extratextual factors		
Sender	Isaac Asimov	Factor irrelevant.	Isaac Asimov
Intention	1. Practice with a spoof article 1. & 2. Entertainment	Factor irrelevant.	Translation of two classic sci-fi short stories
Audience	Reader's of the sci-fi magazine, scientists, especially chemists	Audiences quite similar, no real relevancy in this case.	Scientists, especially chemists, people who are interested in Asimov's writings
Medium	A 1940's and 50's science fiction magazine	Factor irrelevant.	The most likely medium for these texts would be also a science fiction magazine or an anthology
Place	Reception: USA	Factor irrelevant.	Reception: Finland
Time	Production: 1947 & 1953 Reception: After February 1948 & December 1953, respectively	Time difference brings some new presuppositions	Reception: 2007 and after.
Motive	1. Need for practice 1. & 2. Money, desire to write	Factor irrelevant.	Practicing translation of science fiction
Function	Entertainment, "fake function" information	Preserving the function important. (Effect)	As in ST
	B. Intratextual factors		
Subject matter	Imaginary chemical compound thiotimoline and it's properties	The subject area (chemistry) is as much part of S-culture as of T-culture, cultural distance not a problem	As in ST
Content	Information of thiotimoline, descriptions of experiment devices, experiment results	Factor irrelevant.	As in ST
Presup-positions	Knowledge of sciences (chemistry)	No explanations required.	1. & 2. Knowledge of sciences (chemistry) 1. Knowledge of world in 1940's
Compo-sition	Typical research paper (separate paragraphs for different topics, has summary & sources)	No changes needed for layout. Standardize the way of reference between the two articles	Layout kept the same
Non-verbal elements	Tables, figures	No changes needed	Tables, figures
Lexis	American English, scientific terminology, neologisms	Specific attention to the terms and neologism	Standard Finnish, scientific terminology, neologisms
Sentence structure	Normal/long sentences, not very complicated	Sentence structure kept the same, unless it complicates the text too much	As in ST, do not make too simple
Supra-segment.	Italics to show stress, introduce new terms	Pay attention to the italics. Is the emphasized word the best one to be emphasized in Finnish?	As in ST
	C. Effect		
Effect	Texts look like real scientific articles, cause amusement	Effect to be kept the same, attention to the style and lexis	As in ST

There are five factors in this table that seem to be the most important for this translation task, that is, time, audience, function and effect, which includes composition, lexis and style. In the following I will discuss each of these briefly.

5.2.1 Time

It has been over 50 years since Asimov wrote the Thiotimoline articles. The world has changed a great deal during this time, and not least in the field of sciences. The fast development of sciences has introduced certain problems into the translation of old science fiction. Science fiction fans who form the largest part of the target group have certain expectations from a science fiction story. In their eyes a story that is supposed to be situated into the far-off future, but has, for example, technical vocabulary that is already out-of-date, is not very credible. On the other hand, the readers might also except the translation to reflect the science fiction of that time, especially in the case of a famous author like Asimov. Because of his fame, many people are interested in the exact way he originally wrote.

In the case of the Thiotimoline articles time is not such an important factor. The articles are not typical science fiction stories. If a translator is given a task to translate an old scientific article, s/he cannot take any liberties concerning the “out-of-date science”, as the article represents the state of the art in the time it was written. The same goes for these articles: they describe the (imaginary) situation of thiotimoline research half a century ago, and from this point of view, everything should be left as it is. On the other hand, the translator should be allowed to have some freedom concerning the preservation the effect of the texts, given that they are not real articles, and so the exact science is not as important as normally.

Another time related thing in the first of these articles is how it makes fun of the Soviet science of its time. The “Russian” references in the bibliography were certainly connected to the equally incredible research by Soviet scientists like Lysenko in the minds of Asimov and his contemporaries. Trofim Lysenko was a Soviet biologist who led a campaign of agricultural science, now known as Lysenkoism, which went

explicitly against the contemporary genetics, claiming that acquired characteristics are inherited (Chambers 1972). Around the time Asimov wrote the first Thiotimoline article, his views basically ruled the Soviet science, and his effect lasted until the mid-1960's. The contemporary Soviet attitudes towards science can be seen in the manifesto of the U.S.S.R. Academy of Sciences, which asserts that "Weismannite-Morganist idealist teaching is pseudo-scientific because it is founded on the notion of the divine origin of the world and assumes eternal and unalterable scientific laws" (Huxley 1949: 87). Weismann predicted the existence of a chromosome, and the Nobel Prize winner Morgan found it, but their results were considered to be reactionary, because they were inconsistent with Marxism-Leninism (Huxley 1949: 38).

This connection is not necessarily clear to modern readers, especially the younger generations, and some of the irony of the text might be lost. For the contemporaries the reason for the parody was quite clear. The Soviet science was, especially in America, in public eye just then – the book about it by Huxley, cited above, was published just a year after "The Endochronic Properties of Resublimated Thiotimoline". The article makes fun of the Soviet science to such extent that it would have been impossible to publish it in Finland for some decades to come because of the political atmosphere. It is an interesting thing to note that in an edition from 1957 these Russian references in the bibliography are missing, whereas in the 1973 edition they have been returned to the text – maybe also in US the publisher thought these references to be too offending to Russians.

5.2.2 Audience

The readers of these early science-fiction magazines in which Asimov published his first stories were quite similar to what Asimov himself was. Around the 1930's and 1940's, the number of science fiction readers was small – but very involved, according to Gunn (1982: 18). They were mostly boys who in general were brighter than their schoolmates, often social misfits because of their personality, appearance or lack of social skills (ibid.). Science fiction was a "literature of the outcast that praised the intellectual aspects of life that its readers enjoyed and in which they excelled and offered more hope for the

future than the present" (Gunn 1982: 18). With time, as Asimov gained fame, his audience naturally grew much wider.

As to the readers of Asimov's stories in general, the modern day target group is quite heterogeneous. One part of it is the science fiction fans who for the most part are teenagers and young adults. In Asimov's case, however, the short stories might also be read by people who do not otherwise read science fiction, and he also has fans of elder generations; people who discovered his science fiction in their youth. Because of this, the expectations towards the target texts might differ quite much inside the target group.

The Thiotimoline articles are quite different from Asimov's other science fiction. For an average science fiction reader they hardly seem very attractive, as their appearance is that of a scientific article, and understanding all the jokes in them requires more knowledge of chemistry than people in general have. This delimits the target group, as many of those who would pick up a story by Asimov would most likely not be interested about these. Nord (2005: 58) distinguishes between the addressee and the chance receiver, i.e. the person addressed by the sender, and someone who just happens to read or hear the text. In the case of the Thiotimoline articles, the number of chance receivers might be high, as Asimov's name on the title page might draw the attention of someone who otherwise would not start reading such an article.

Moreover, there are those who read everything by Asimov they can get their hands on. As Asimov himself said, concerning his fans and some early stories that were never published and have disappeared: "They want those, too, apparently, and seem to think I have negligently destroyed a natural resource" (Asimov 1973: 2). Also, there can be people who want to read these articles for other kinds of reasons, for example if they hear that they parody Soviet science.

Even though, as Nord (2005: 58) says, the translation can never be addressed to the same audience, and although nowadays the texts may attract somehow wider group than earlier, the main core of the audiences of the source texts and the target texts of this study are quite similar. The original Thiotimoline articles were published in a science fiction magazine, and it is safe to assume that not all of the readers had adequate knowledge of chemistry to understand and enjoy them. The articles found their true audience as copies that circled among chemists and physicists at university departments.

Science is, in many ways, a universal thing, and American and Finnish scientists share the same knowledge of scientific phenomena. It does not matter much whether the article is read by an American or a Finnish scientist, as the jokes in them are quite international.

5.2.3 Function

Christiane Nord (2005: 77) defines text function as “a communicative function, or the combination of communicative functions, which a text fulfils in its concrete situation of production/reception.” She points out that there is “no such thing as a source text with a text-immanent function”, but there is a variety of different source text versions which all have different functions (Nord 2005: 36). Functional equivalence is often held to be the starting point in translation. Nord (2005: 26) points out that most often this is not the case – normally the function changes, and it is only in special cases where it is kept completely the same. As the function of the source text is specific to the original situation, it cannot stay the same through the translation process, and similarly, the function of the target text is specific to the target situation, and Nord calls it an “illusion” to assume that the function would automatically be the same (Nord 1997: 49). She also points out that texts seldom have only one function but various, forming a hierarchy of functions (ibid.).

The main function of real scientific articles is dissemination of research-based information. This function is kept also in the translation, as the information the articles offer is their most important factor. Also the articles of this research pretend to present new information of a newly found substance, thiotimoline, and so one could say that in a way these fake articles also have a fake function. It is, however, the way this article pretends to be real science creates the real function, the entertainment derived from the ridiculousness of the findings that are so seriously presented in the articles.

In this case, the text’s function has not changed: it is still a fake science article, targeted for people with at least average knowledge of chemistry and physics, and its main purpose is to entertain and amuse them. As it is, the scientific nature of the text has to be maintained, and it has to be translated as it were real science.

5.2.4 Effect

The effect of a text is born from the readers' expectations, from the comparison of extratextual and intratextual features, as was explained before in chapter 2.2. As the category of effect refers to the relationship between the text and the readers, its analysis is a question of interpretation and not of a linguistic description (Nord 2005: 143). So also in these translations it is my interpretation that forms the basis from which I approach the effect.

The effect of these articles builds in much on the way they are written like real articles of chemistry; they even have made-up bibliographies. As Asimov amusedly pointed out, some readers even took the first one, "The Endochronic Properties of Resublimated Thiotimoline", for real (Asimov, 1973: 474). There are different things that make the article seem real: composition, lexis, and style, mainly. I will discuss all of these in the following.

5.2.4.1 Composition

The composition of the texts is that of actual articles, presenting information in the style typical of research papers. The subject matter is discussed in a systematic order, different topics are divided into separate paragraphs, and there is a summary in the end. The tables and figures, as well as the fake bibliography in the end, add to the impression of a real article, so that at first glance the reader cannot notice that the articles are fake.

One thing concerning composition is the bibliography and the reference style used. These are different between the two articles, and they have to be standardized to form a coherent entity. I decided to adopt the second articles style also for the first one, as it is more precise and clear – the first article did not, in fact, have any references to the bibliography in the text. There are also some differences between the way the bibliographies are arranged, but these I decided to leave as they are.

The bibliographies in the end present another interesting question: what to do about them in translation? Normally bibliographies are not, of course, translated, but as in this case the bibliographies form a part of the story they cannot be left completely untouched. Such titles as "Determinism and Free-Will. The Application of Thiotimoline

Solubility to Marxian Dialectic" or "Differences in mental Attitude, as Measure by Thiotimoline Studies, of Walks with Members of One's Own and the Opposite Sex. New light on a puzzling problem" cannot be seen as anything but a part of the articles' joking. As the idea is to translate the articles for the Finnish audience so that also those who do not know any English get the most out of the stories, I decided to leave the bibliography otherwise as it is but add the translations of the titles in parenthesis.

5.2.4.2 Lexis

Being American, Asimov naturally wrote American English. Usually his vocabulary is quite simple, but that is not the case in these articles. The vocabulary used is, in general, relatively complex and formal, including such words as *perpendicular*, *prosaic*, or *necessitate* which are not a part of every day vocabulary. This kind of vocabulary helps to create the effect of a real scientific text.

Another aspect of the lexis is that it is, naturally, highly scientific. The majority of these words and terms belong to the fields of chemistry and physics (*hydrocarbon nucleus*, *sublimation*, *sintered glass filter*), but there are some examples also from other fields. The proper translation of the scientific terminology has a strong effect on the plausibility of the articles, and therefore much attention has to be paid on it.

The neologisms in the texts pose another challenge. They are for the most part related to science – especially chemistry and physics – and as the texts' function has to be kept the same, these have to be translated in a way that makes them fit scientific style without breaking it. Some examples of them appear already in the titles: *thiotimoline*, *endochronic*, *micropsychiatric*. They have an important role in creating the effect of a real scientific article in the source texts, and this effect has to be transferred to the target texts.

5.2.4.3 Style

Scientific style, which was discussed in chapter 2.5, is another feature that is important for creating the right effect. By style I mean here the way the author writes, *how* s/he says what he says. Mari Peepre (2000: 67) talks about the *manner of linguistic*

expression. Peepre (2000: 67) describes four different things to analyse a writer's style: diction, sentence structure, density and type of figurative language, and finally the possible patterns of rhythm and sound. These are, of course, tools meant in the first hand for analysing fiction, and as was pointed out in chapter 2.3, fiction and scientific texts have very different styles, such things as figurative language and rhythm missing almost completely from the latter. It is the first two groups (diction and syntax) that are most central of these when talking about scientific style – even though it can be said that the latter two also characterize scientific style by their absence.

The correct scientific style is an important factor in these translations to strengthen the impression of a real scientific article. Sometimes this might even require the translator to make the text appear "turgid", which was the word Asimov himself used. As was said in chapter 2.5, it is quite likely that Asimov was parodying the scientific style, and his comments about the turgidity of the style of dissertations strengthen this view. In fact, he had originally wanted to publish the first article under a pseudonym as he was going to have oral examinations for his Ph.D. soon after the publication and he had been worried that some "austere member of the examining board" would decide he was making fun of chemical research and be offended (Asimov 1973: 473). In the end, his worries were unfounded. It is still good to keep in mind that the texts are not supposed to be too simple, and if the original text at times seems to be very much like a stereotypical scientific text the translator should consider whether this is intentional, and keep certain rigidity in the translation.

5.3 Translation Strategy

Through the ages, there have been many different kinds of translation strategies, dictated by the commissioners', publishers', and readers' demands, as well as by the translators' own preferences (Williams and Chesterman 2002: 17). For example domestication, in which the goal is to minimize the foreignness of the target text, and foreignization, which aims to translate the text highlighting the foreign identity of the source text, are two examples of translation strategies (Munday 2001: 146-147).

Chesterman (1997: 89) defines translation strategies as forms of explicitly textual manipulation, which are "directly observable from the translation product itself, in

comparison with the source text." In other words, such things as information searches, conversations with colleagues and friends, etc. are not included; they are not visible in the text (Chesterman 1997: 89). In skopos theory, it is the skopos which determines the strategy that will be used.

The skopos for these translations was determined to be the preservation of the effect of the texts; and the effect, on the other hand, was seen as the result of the stylistic and lexical choices made by the author. Because of this, specific attention will here be paid on the translation of these factors. Still, it is good to remember that, as Nord (2005: 148) points out, the translator "need not – and indeed must not! – transfer every single effect-producing feature as such, but, if this is required by the translation skopos, should transfer the global effect achieved by the particular combination of effect-producing features."

In the translations I will aim for producing a similar effect as the original articles have in a way that in each situation seems to fit Finnish the best. The recreation of effect is predominating in the translations. For example, if there are times when literal translation would not work in Finnish in regards to the effect, I will make a less literal translation. If it is not possible to convey for example some stylistically important feature in the translation, this can be compensated in some other part of the text.

6 ANALYSING THE TRANSLATIONS

In this chapter I will describe the translation process and discuss the translations from the point of view of the skopos, using the theories and methods discussed earlier to argue for the decisions I have made. The translations together with the source texts can be found in Appendices I and II. As has been stated before, the effect is the most important factor of these texts. As it is, mainly, based on style and lexis, these are the features on which I am going to concentrate on here.

Lexis includes both the scientific terminology and the neologisms. For the latter I will use Newmark's classifications to help to define the different kinds of neologisms I will face. As for the terminology, there are exact equivalents in Finnish for all the scientific terms that appear in the articles, they only have to be found. The choices will

be substantiated on the basis of dictionaries and expert opinions: I have discussed the translation problems with my father who has a doctorate in physics. I will also pay attention to how hard or easy it was to find the correct terms.

As for the style, as the emphasis is on the effect, the most important thing here is to achieve a style that feels genuine for a scientific article. In other words, the preservation of the effect is more important than making a literal translation. Even though one has to be careful when translating scientific texts, it must be remembered here that this is, in the end, a work of fiction, which gives the translator more freedom. The stylistic decisions will be examined keeping in mind the skopos and the various factors that have been discussed above in chapter 5.2. If some changes are made, those will be explained in the terms of the skopos. I will also pay attention to the possible problematic cases in the translations, as far as those are somehow related to the skopos and the function of the translations.

In the following subchapters I will first discuss the translation process in general, and then treat these three factors (terminology, neologisms, and style) separately. The intention is to give an account of different problems faced in the translation process, and also to explain the decisions that have been made.

6.1 The Translation Process

The term translation process can mean various things. According to Malmkjær (2000: 163), it can refer to the cognitive processes, both conscious and unconscious, activated during translating, as well as to the more “physical” process which begins when a client contacts a translation agency and ends when s/he is satisfied with the product. Christiane Nord described the translation process with the looping model (see chapter 2.2) and as I used her text analysis model for the analysis of the texts, I approached also the translation process from her point of view. This looping model is close to Malmkjær’s latter example, as it, among other things, takes into account also the translation brief.

The first thing to do was, of course, to read the texts to get overall view of them, to find out what they were like and what seemed to be most important in them. After the definition of skopos I continued first with the source text analysis, then with the target text, utilizing the table Nord presented in her model. Many times during the actual

translation I had to return to this table, sometimes to consult it, sometimes to complement it with things I had realized during the translation. There was, as Nord said, much “looping” in the translation process; it was hardly linear in any way. There was constant confirming and correcting things that were already analysed and sometimes also translated, and there were big differences between the first and the final drafts.

Writing the first drafts of the translations was not a lengthy process. They were finished quite easily, and the general writing process in itself was not that hard. Reading through the translations and producing the next drafts, on the other hand, was quite time-consuming, as now I had to consider all special cases (for example neologisms) more carefully. It is quite true that we are often blind to our own mistakes. Very often I noticed that when some time had passed, it was easier to notice mistakes in the text, or to come up with better translations. Because of this, I often put aside the translations for a while and concentrated on other parts of the study.

The revision process continued even during the time I was writing the following analysis on the translations. When doing the analysis and explaining my choices, I naturally had to think more deeply about them, and because of this I often discovered new aspects in the translation problems I was dealing with. In fact, the translation process seemed to be never-ending: there was always something in the text that could have been improved, something that required attention. I could have kept on reading and rereading the translations forever, but in the end the process simply had to be cut off.

6.2 Lexis

In this chapter I will describe the decisions I made in the translations as far they concern lexical choices. The discussion will be divided into three parts: scientific and technical terminology, neologisms, and invented proper names. In fact, the last one is in a way a subcategory of neologism, but it is briefly discussed here on its own. There are also certain other decisions I had to make on the lexical level, but as they are about stylistic questions, I will discuss them in the chapter 6.3.

6.2.1 Terminology

Scientific and technical terminology poses a considerable challenge for the translator of all the types of science fiction. As has been stated before, a science fiction translator faces similar requirements as a scientific translator, in other words, knowledge of science and technology is quite essential in the translation process. Especially in science fiction like these articles, where the main idea is to pose for real science, scientific accuracy is important in the translation. In the following I will consider some examples from the Thiotimoline articles.

Many scientific terms are translated into Finnish with only minor changes, just by modifying the word according to Finnish orthography. Some examples that appear also in the texts are *catechol* which becomes *katekoli*, *phenol* which is *fenoli*, and *amino group* which is *aminoryhmä*. In some cases it can be relatively easy even for a person with no scientific knowledge to guess the Finnish form when he sees the English. One of the greatest risks in translating the terminology is to assume this is how it always goes. A completely different Finnish term can, of course, be used instead of the international one. For example, even among the names of elements which usually remain the same in different languages (for example, between English, French and Finnish: *calcium – calcium – kalsium*, *magnesium – magnésium – magnesium*) not everything is called by the same name in English and Finnish. Some examples that appear in the source texts of this study are *sodium* and *potassium*, which are, respectively, called *natrium* and *kalium* in Finnish. Another similar example from the texts is *isomerism*, which translates as *isomeria*, not **isomerismi*, as one could easily expect. A similar case is the translation of *the laws of thermodynamics*. This is where I almost made a mistake, before my father pointed out to me that *law* here translates as *pääsääntö*, not *laki*. These are, so to say, easy mistakes, as *laki* is quite a common translation for *law* in chemistry (an example from the first article: *law of conservation of mass-energy – aineen häviämättömyyden laki*).

Another problem rises from the fact that it is not necessarily always quite clear exactly what the author has meant. In the second article, Asimov writes “the distribution of will-power varied in the ordinary bell-shaped probability curve” (Appendix II, p. 87).

Here, I concluded that what is meant by "ordinary bell-shaped probability curve" is the Gaussian curve, even though the curve in the picture presented in the article is not completely symmetrical. Some research showed that the curve in question is sometimes called also the "bell curve" in English, and so I decided that the correct translation here is simply *normaalijakauma*: "tahdonvoiman jakautuminen noudatti tavallista normaalija-kaumaa."

Two-way stopcock (stopcock II which can be seen in Figure 2 in the second article) was a technical term I had to consider for some time. My initial translation of this was quite literal: *kaksisuuntainen hana*, but I was certain this was not completely correct. After some research I found two possible translations: *kääntöhana* and *kaksitiehana*, and after consulting various dictionaries, I decided that the latter one is the correct term here (see for example *Englanti-suomi suursanakirja*).

In the first article Asimov talks about a *plateau effect*, a term which refers to the behaviour of thiotimoline. Asimov reports that "increasing the volume of solvent enables the thiotimoline to dissolve more quickly" (Appendix I, p. 73), but at one point the increase of solvent will no longer have a notable effect. *Plateau Height* and *Plateau Volume* are values attributed to this effect. The translation of *plateau* was a little problematic. *Tasanko* or *tasanne* would be the direct translation, but it does not work in Finnish in this context.

Thinking about what actually happens in this phenomenon – the increase of solvent ceases to have an effect – leads one to think of a saturation effect, which would be in Finnish *kyllästymisilmiö*. There is an online Finnish – English bioenergy glossary (http://gis.Joensuu.fi/termit/) that talks about this phenomenon with just these words concerning greenhouse gases. It defines saturation effect/kyllästymisilmiö as a "condition in which a further increase in the concentration of a gas does not proportionally increase its radiative absorption ability." This sounds exactly like what is happening with thiotimoline – in fact, changing "concentration of a gas" in the previous sentence to "volume of the solvent" and "its radiative absorption ability" to "thiotimoline's solubility" gives us a sentence that could be from the articles. All this strengthened my decision to translate these three terms as *kyllästymisilmiö*, *kyllästymis-korkeus*, and *kyllästymistilavuus*.

In both articles Asimov uses the word *cell* when describing certain devices for thiotimoline research. This word has many different translation possibilities in Finnish. If we remain in the province of chemistry, Englantilais-suomalainen kemian perussanasto, ESKP, lists the following translations: *solu, kenno, (alkeis) koppi, kyvetti, astia.* Of these *kyvetti* was a word I was not familiar with. This word comes from the French word *cuvette,* and it refers to a certain kind of laboratory glassware, which is usually a small square tube, sealed at one end and used to hold samples for spectroscopic experiments (http://en.wikipedia.org/wiki/Cuvette). This description fits the cell in question quite well, and so I have translated it as *kyvetti*.

There were also some words that are also part of the everyday vocabulary but have specific meanings in the scientific context. Table 1 in the first article lists the effect of thiotimoline's purification by recrystallization and resublimation on its endochronic properties. The first term in that table is *as isolated*, i.e. nothing has yet been done to the substance after its isolation from its natural source. In Finnish this would be literally translated *eristettynä*, but this does not work in this context. I concluded that in this case it is better to say it differently, and translated this as *puhdistamaton uute* ('non-purified extract').

The rest of the terminology was relatively simple, as they could be checked easily from dictionaries. For example, ESKP confirmed that *freeze-drying* is *kylmäkuivaus* in Finnish, and *induce* is simply *indusoida*. *Supersteric hindrance*, another term from the second article, appeared at the first glance quite peculiar, but again ESKP knew such a term as *steric hindrance*, which it translated as *steerinen este*. Apparently, there is no such a thing as a "supersteric" hindrance, so this is, in a way, also a neologism. After finding steric hindrance in a dictionary, the translation was simple: *supersteerinen este*.

Overall, the translation process of the terms was not too demanding. Even at times when the translator is not familiar with the term, dictionaries often help, but there the translator has to be careful to choose the equivalent expression from the ones the dictionary offers, and also s/he has to remember that the dictionaries are not always faultless. Moreover, scientific fields develop fast, and new terms can appear that are not found in the dictionaries. When in doubt, it is always best to check the term from

someone who knows the field in question. The hardest part for me in the translation of the terminology was due to the fact that, despite having completed basic studies in both chemistry and physics, I am far from an expert, and so it took me sometimes a long time to figure out the correct translation. However, in the end I am quite confident that I managed to find the correct equivalents for all the terms.

6.2.2 Neologisms

Newmark (1988: 143) says of neologisms in fiction that "any kind of neologism should be recreated; if it is a derived word it should be replaced by the same or equivalent morphemes, if it is also phonaesthetic, it should be given phonemes producing analogous sound-effects." These two articles contain various kinds of neologism. Some are what Newmark (1988: 143) calls derived words, words that are derived by analogy from ancient Greek and Latin morphemes. Nowadays this procedure is used mostly in the field of science and technology (ibid.) and as such non-cultural words they often become internationalisms. This is the case also with many of the neologisms in the articles. Then there are those neologisms Newmark calls new coinages, completely new words that often, just like derived words, become international. One example of them is 'quark' from James Joyce's *Finnegan's Wake* (Newmark 1988: 142). There are also, among other things, some examples of new collocations, which consist most commonly of noun compounds or of a noun and an adjective (Newmark 1988: 143).

As I was making the first drafts of the translations, I made notes of all the possible words which seemed to me to be neologisms. This was one of the ways of defining neologisms, according to Cabré (1999: 205): a unit is a neologism if speakers perceive it as a new unit. As has been stated before, the translator has to be careful with the words that sound new – it is possible that there already is an established translation for the word. In the case of these articles this is less likely, as the subjects discussed are quite imaginary, and in the end, all the words I had listed turned out to be neologisms.

To get a broader picture, I used three different dictionaries when defining the novelty of the form of the neologisms: *Longman Dictionary of English Language and Culture* (1993), *Chambers Twentieth Century Dictionary* (1972) and *The Wordsworth Dictionary of Science and Technology* (1995), Longman, Chambers, and DST from now

on. None of these dictionaries is very new, but all are published long after the articles were originally written. I checked all these dictionaries for the roots of the neologisms, and in general, many of the roots were found in them – in fact, there was only one that did not appear in any of them. This was another half of the word *thiotimoline*, which is the first neologism I will discuss here.

Thiotimoline The first neologism the translator faces is the keyword of the articles. Thiotimoline is an imaginary substance of quite a fantastic nature – it dissolves into water before the water is added into it. This word consists of the Greek prefix *thio-* and another imaginary substance, *timoline*. Of the roots of this word, *thio-* (which refers to sulphur) appeared in two of the three dictionaries (Chambers and DST), but *timoline* was not found in any. *Timoline* appears to be a new coinage, even though, as Newmark (1988: 142) points out, there is no such thing as a brand new word, and all sounds and phonemes have some kind of meaning. Whether *timoline* is based on some existing words or if it is just a random word Asimov came up with is not quite clear. Keeping in mind Asimov's Russian origin, and the way in which he mocks contemporary Russian science in the first article, one could assume that the word might be based on Russian, but this is not certain. There is a chemical compound called *thymol* that is *timol* in Russian, but it is uncertain whether this has anything to do with thiotimoline. It is also possible that *timoline* is a pun on *timeline*, as this substance plays some peculiar tricks with time. Whatever is the case, the translation of *thiotimoline* into Finnish is quite simple: a naturalisation process gives us *tiotimoliini*. *Thio-* prefix is used in Finnish in the form *tio-*. This translation is in line with existing words, such as *thiocyanate*, which translates as *tiosyanaatti*. Of course, the possible pun is lost here, but as its existence is not certain in the first place and conveying it into Finnish would be problematic, I decided to leave it out.

Endochronic, endochronometer, endochronometroscope Also the second neologism appears already in the title of the first article: "The Endochronic Properties of Resublimed Thiotimoline". This word is a combination of a Greek prefix *endo-* (from *endon*, 'within') to a common English word *chronic*. *Endo-* is not completely uncommon either: it was, again, found in other dictionaries but Longman, and it appears in many different existing words (endogamy, endolymph, endothermic). *Chronic* is

found in all dictionaries, but it is interesting to note DST ties its meaning only to the field of medicine. This seems to be what van Dyke called a recycled term: a term that has been previously associated with completely different field. Endochronometer and endochronometroscope have the root *meter*, which is again found in all dictionaries. It is "a general term for any electrical measuring instrument, but usually confined to integrating meters" (DST).

Like thiotimoline, *endochronic* is best translated keeping its original form and just adjusting it to Finnish phonetics: *endokrooninen*. Also this translation gets support by analogy from the official translation of similar, existing terms, for example *endothermic – endoterminen*. Similar cases are words like *endochronometer* and *endochronometroscope*: *endokronometri* and *endokronometroskooppi*, respectively. The translation of *exochronic*, which also appears in the texts once, follows logically from *endokrooninen*: *eksokrooninen*.

<u>Horizontal, vertical, and diffuse schizophrenia</u> The second article enters the field of medicine as it presents new ways to diagnose schizophrenia with the help of thiotimoline research. All of these words are found both in Longman and Chambers; most likely because of the dictionary's specialized nature, *schizophrenia* is missing in DST, and the other words appear there only in compounds. All of these words are relatively common, but their combination is quite unusual. The names for these new divisions of schizophrenia are formed as new collocations, a method which, according to Newmark (1988: 145), is most common in the social sciences and in computer language. *Horizontal schizophrenia* and *vertical schizophrenia* are relatively simple. As words like *horisontaalinen* or *vertikaalinen* are not uncommon in Finnish, I first decided to translate these terms directly as loan translations: *horisontaalinen skitsofrenia* and *vertikaalinen skitsofrenia*, but after some consideration combined the words to *horisontaali-* and *vertikaaliskitsofrenia*. These are long words, but in the end they are more practical. For example such a term as *vertical schizophrenic* is better translated as *vertikaaliskitsofreenikko* than *vertikaalinen skitsofreenikko*, which sounds quite silly. *Diffuse schizophrenia* on the other hand is a little different, and I considered for some time translating the word *diffuse* as, for example, *hajanainen*, but in the end I decided to

keep this too as it is, and translated the term as *diffuusiskitsofrenia*. The word *diffuse* is, after all, usually translated like this in natural sciences.

Levo, dextro, supra and infra varieties The names of these subdivisions of the schizophrenic varieties that were listed above are compounds of Latin and English words. The Latin words could be translated according to their meaning (left, right, upper, lower), but these words can be used in Finnish scientific texts as well as in English in their Latin form. All of the Latin words (except *dextro*, which appears only in a compound) are found in Chambers dictionary, as for the other two dictionaries, if the words appear in them at all, they do so in compounds. Based on the dictionaries, *supra* and *infra* seem to be much more common words than *levo* and *dextro*, as they appear, at least in some form, in all of them. I have kept them intact, with the exception of changing *dextro* to *dekstro*, which is the Finnish written form, and writing the words together in the Finnish way. After some consideration, I decided it to be best to translate *variation* simply as *variaatio*: *levo-*, *dekstro-*, *supra-* and *infravariaatio*.

Willometry A more complicated case is presented by the word *willometry* from the second article. This word combines a very common English word *will* to the suffix *-metry*, of Greek origin. DST, the only dictionary that had this suffix, defines it in the following way: "A suffix denoting a method of analysis or measurement, e.g. acidimetry, iodimetry, nephelometry." All of these example words are translated into Finnish as international words through the naturalisation procedure: (asidimetria, jodimetria, nefelometria). The difference here is that both parts of these words derive from Greek or Latin words, whereas *willometry* uses an English word as a root. If we follow the example of these words, one would consider translating *willometry* as *willometria* or *villometria*, but I concluded that the best translation here follows the way the original word is constructed in English, in other words, combines Finnish directly to the Greek suffix: *tahtometria*. This word is similar to the English one in the sense that it allows even non-expert readers to understand what the word is about, which is not the case with words like nephelometry.

The translation of all these neologisms was not entirely problem-free. Even though many of them were in the end quite simple (endochronic – endokrooninen, levo variety – levovariaatio) most of the translations were still far from being self-evident.

Sometimes it felt like these little words like *willometry* required excessive attention and time. Like with the translation process itself, at one point I had to put a stop for pondering these questions, or otherwise the translations would have never been finished

6.2.3 Proper names

Even though for the most part I am not going to translate the proper names in the articles, I decided that they too deserve some attention. When translating a normal science fiction story, translating the names can form an important part of the translation. Names that clearly mean something or have significant connotations in source language should be delivered also to the target language in a way that conveys these connotations properly. In this case, as the articles pose for real ones and all the place and personal names in them, though imaginary, are supposed to refer to real places and people, they have to be left as they are to strengthen the impression of the articles being real.

There were only two cases where I had to translate a name, both being names for institutions: *The American Association for the Advancement of Quantitative Psychiatry* and *The Psychosomatic Institute*. The translations were, for the most part, quite straightforward. The word *institute* was slightly troublesome, as I considered for some time whether to use *instituutti* or *tutkimuslaitos* in its place. *Tutkimuslaitos* did not first sound to me like an expression that is equivalent enough with institute, but in the end I decided on it and translated the name as *Psykosomaattinen tutkimuslaitos*. *Nykysuomen sanakirja* (1989) gives *tutkimuslaitos* as one possible meaning of *instituutti*, and moreover, ‘Psykosomaattinen tutkimuslaitos’ sounds better in Finnish than ‘Psykosomaattinen instituutti’.

In the other case, there were two things that required more consideration: whether to translate the word “American” in the name or not as it did not did not appear central in the text and seemed a little non-fluent in Finnish, and if *yhdistys*, *liitto* or *säätiö* would be best translation for *association*. In the latter question I decided on *yhdistys*, as that is a more literal translation of association, *säätiö* would be more like foundation, and *liitto*, on the other hand appeared to be uncommon in this kind of context. As for the other question, at first I decided to translate the name without it, but in the end concluded with *Amerikan kvantitatiivisen psykiatrian edistämisyhdistys*.

As many of the other names – that I have not translated – carry different connotations, and as Asimov certainly has not chosen them arbitrarily, I will discuss some of them here. One example of them, in the spirit of making fun of scientific style, is one of the fake sources in the first article. The name of another of the authors of the article in question (which, ironically enough, is the only source cited in the articles that has nothing to do with thiotimoline, but could be a serious article about real science) is given as *Feinschreiber*, which is German for "fine writer".

Also Asimov's place names are quite humorous. One example of these is Potlikker, the city of the Psychosomatic Institute in Oklahoma. *Potlikker*, meaning *pot liquor*, is a food associated with Southern US, which might have something to do with Asimov's decision to use it for a city in Oklahoma. Otherwise the name sounds quite random, and its main purpose is, most likely, to amuse the readers who are familiar with the word.

Another example is the name of the college whose students took part in the research in the second article, namely Comstock Lode College. Anthony Comstock was an American denunciator of nude in art, and the term *comstockery* derived from his name means, according to *Chambers Twentieth Century Dictionary*, simply *prudery*. This does not seem to be a coincidence, if one keeps in mind what happened between one of the male students and a female technician. At one point, the tests showed an apparent increase in the student's self-confidence, and when the technician in charge for the experiment was questioned, she "insisted that no untoward event had taken place" – the student had simply wished to go for a walk in the countryside that evening and she had agreed to accompany him (Appendix II, p. 88). When the "author of the article" offered to join them, the effect was opposite. Asimov certainly makes it no secret that something "untoward" was happening between the student and the technician, and keeping in mind his flirtatious nature with women, this episode feels, in a way, very Asimovian.

I have not been able to find out the origins of most of the other names. Of course, it is quite possible that there is nothing special behind all the names in the articles, that they are simply some random names Asimov came up for the articles. One could

assume, though, that the name of a “psychochemist” called Freudler is based on the name of Sigmund Freud.

6.3 Style

In the following I will discuss the different stylistic choices I have made in the translations. There are different kinds of situations in which style comes into play. First of all, there are lexical questions: whether a certain word would be more appropriate in a text of this particular genre than another. Secondarily, there are questions that rise from the skopos – in this case from the intention of preserving the effect and the style of the original text.

6.3.1 Stylistic choices in lexis

The credibility of scientific articles rests for a great deal on vocabulary which, even though not scientific or technological by nature, is still typical for the genre. These little words here and there in the text, though they might not appear to be that central, are still important for creating the right effect, which was the skopos of the translations. I will consider some cases in the following.

One example appears in the first sentence of the second article, in which the word *unusual* requires some extra attention.

> 1a) Some years ago, the <u>unusual</u> endochronic properties of purified thiotimoline were first reported in this journal. (80)

The most common translation for this word would be *epätavallinen*, or maybe *erikoinen*, which were words that first came to my mind when translating this sentence. In the end I decided to translate it as follows:

> 1b) Joitakin vuosia sitten tässä lehdessä julkaistiin ensimmäistä kertaa raportti puhdistetun tiotimoliinin <u>poikkeuksellisista</u> endokroonisista ominaisuuksista. (80)

Poikkeuksellinen, *poikkeava* are words that are quite often used in Finnish scientific texts to describe unusual behaviour of different kinds, and of these, the former fits the context better.

The next case appears immediately in the next sentence of the article.

> 2a) . . .thiotimoline research has languished, due largely to the distressing skepticism with which the first reports were met. (80)

Here, I had to decide whether to use a loan word, *skeptisyys*, or translate the word for example as *epäuskoisuus*, *epäily*. Of these, only the first two choices were what I considered seriously:

> 2b) . . .tiotimoliinitutkimus on laantunut, suurelta osin ensimmäisiä tutkimuksia kohdanneen ahdistavan epäuskoisuuden vuoksi.

> 2c) . . .tiotimoliinitutkimus on laantunut, suurelta osin ensimmäisiä tutkimuksia kohdanneen ahdistavan skeptisyyden vuoksi. (80)

In the end I decided on the latter one, which sounds more scientific and academic.

The above case illustrates one central definition of policy about the vocabulary I had to make: to what extent I would use loan words in the translations when translating words which have both Finnish and international equivalents: for example, whether to translate words like *speculate* as *spekuloida* or then as *pohtia* or *mietiskellä*. It can often be that the international word provides a stricter equivalent, and in that sense those should be favoured. Also, keeping in mind the skopos of the translation, and the fact that the text is not supposed to be made too clear and simple, some words of foreign origin fit the translation quite well. Of course all cases have to be considered individually. Some other examples are discussed below.

In the following sentence Asimov uses the word *quantitate*, which is a relatively uncommon word, formed by back-formation from *quantitative* (http://www.thefree dictionary.com/quantitate).

> 3a) . . .certain mental disorders can be quantitated and their diagnosis converted from an uncertain art to an exact science. (80)

My first thought was to translate this using the Finnish verb *mitata*, to measure, as this is what the word is about – measuring quantity. However, this made the sentence sound somehow non-fluent and a little weird, maybe partly because of the uncommon idea of

“measuring a sickness.” In Finnish, fever can be “measured”, but with a mental disorder this did not sound to be the right word.

After some consideration I decided that this is one of those cases where using an international word is appropriate, and decided to translate the word as *kvantifioida*. In fact, this word derives from *quantify*, but as the meaning of it is the same as of *quantitate*, this seemed to be the best choice. This is one of those cases where the international word comes closest in meaning, whereas the original Finnish words can have different connotations.

> 3b) . . .tiettyjä mielisairauksia pystytään mittaamaan ja niiden diagnosointi voidaan muuttaa epävarmasta taiteesta eksaktiksi tieteeksi.
>
> 3c) . . .tietyt mielisairaudet voidaan kvantifioida ja niiden diagnosointi muuttaa epävarmasta taiteesta eksaktiksi tieteeksi. (80)

A different case was posed by the term *endochronic interval*. This is, in a way, a neologism, one kind of a new collocation, the other half of which is formed by another neologism from the text. The greatest problem with this term was posed by the word *interval*. My preliminary translation of it was *intervalli*, and in the end, after long consideration, I kept it like this. Other choices I considered were *aika* and *aikaero*, but *intervalli* is the strictest equivalent and as an international word it fits the articles quite well.

6.3.2 Other stylistic decisions

One thing to remember when considering the questions of style is the fact which was noted when determining the skopos: that Asimov was not even trying to write a clear and concise paper, but, quite on the contrary, he wanted to write in a way which he himself considered bad. My decision was not to simplify his language but keep it as complicated as it is. Because of this, there were times when I could think of a better way to say something but did not, or if I had done so without thinking corrected my own writing into a more complex direction.

For example the following sentence would have been easy to write in a simpler manner in Finnish:

> 4a) A period of even slight hesitation in adding the water reduces the negative time of solution, not infrequently wiping it out below the limits of detection. (70)

My first translation of this was as follows:

> 4b) Lyhytkin epäröinti ennen veden lisäämistä lyhentää negatiivista liukenemisaikaa, usein havaitsemisrajan alle.

In this sentence, I had compressed into three words the whole clause "not infrequently wiping it out below the limits of detection." If I were doing a translation of a normal scientific paper, I would most likely have kept it this way, but in this case I decided on the following translation.

> 4c) Lyhytkin epäröinti ennen veden lisäämistä lyhentää negatiivista liukenemisaikaa, useissa tapauksissa niinkin paljon, että se jää havaitsemisrajan alapuolelle. (70)

Another case where I made my writing afterward more complex was this:

> 5a) In Figure 2, the results are given of the effect of the time of solution (T) of varying the volume of solvent, where the solvent consists of varying concentrations of sodium chloride. (73)

In my first draft translation of this sentence I had divided the above sentence into two sentences, which I later combined together. Even so, the translation seemed somewhat simplified to me, and I made it a little more complex:

> 5b) Kuvassa 2 esitetään liuottimen tilavuuden vaikutus liukenemisaikaan (T), kun liuottimina käytetään eri vahvuisia natriumkloridiliuoksia.

> 5c) Kuvassa 2 esitetään minkälainen vaikutus liuottimen tilavuudella on liukenemisaikaan (T), kun liuottimina käytetään konsentraatioiltaan eri vahvuisia natriumkloridiliuoksia. (73-74)

The first translation would have worked quite as well, if not even better, if the text were a real article, but in an attempt to get something of the monstrous use of "of" into the translation, I decided to use the latter version.

The next sentence is a similar case. What the sentence in fact says is that the substance (thiotimoline) cannot be produced in a laboratory, and this is how I first translated it, but in the end decided to change the translation. The final translation is also in parts more literal.

> 6a) Since no method of laboratory synthesis of the substance has been devised... (71)
>
> b) Koska ainetta ei pystytä tuottamaan synteettisesti laboratoriossa . . .
>
> c) Koska minkäänlaista menetelmää aineen tuottamiseksi synteettisesti laboratoriossa ei ole pystytty kehittämään . . . (71)

In certain cases, the translator has to be careful not to give wrong impressions with phrases that can create different connotations than what the original text meant. One example of this concerns the way the word *negative* is used when talking about research results. My first translation of "negative nature" in the following sentence did not quite work:

> 7a) First attempts to measure the time of solution of thiotimoline quantitatively met with considerable difficulty because of the <u>negative nature</u> of the value. (70)
>
> 7b) Ensimmäiset yritykset mitata kvantitatiivisesti tiotimoliinin liukenemisaikaa kohtasivat suuria ongelmia mittaustulosten <u>negatiivisen luonteen</u> vuoksi.

The problem here is that "negative result" is a way to refer to an experiment that has failed, in one way or another. My first translation might have given the impression that the experiments were not successful, which is not the case. So, I changed the translation in the following way to make it unambiguous:

> 7c) Ensimmäiset yritykset mitata kvantitatiivisesti tiotimoliinin liukenemisaikaa kohtasivat suuria ongelmia mittaustuloksina saatujen arvojen <u>negatiivisuuden</u> vuoksi. (70)

One stylistic feature that is common for both English and Finnish, mentioned in chapter 2.5, is the use of first person plural to refer to the author/s of the text. Asimov used this sparingly: according to table 2 in chapter 4 he had only 1.1% personal words in

the Thiotimoline articles, and the majority of them seem to be in the second article. The first article is indeed quite impersonal: it has only two occurrences of “we” and four of “our” (compared to ten and four, respectively, in the second article).

As using “we” is a completely suitable strategy also in Finnish, I have left most of these cases as they are. There are only a few cases where I have changed this. One of them – and the only case where I have left “we” out, is in the first article.

8a) Though this is not properly within our province as physical chemists . . . (70)

8b) Vaikka tämä ei täysin kuulukaan fysikaalisen kemian aluepiiriin . . . (70)

Here, using a literal translation “Vaikka tämä ei täysin kuulukaan aluepiiriimme fysikaalisina kemisteinä” does not sound fluent, quite on the contrary. The use of essive case in “as physical chemists” sounds weird and stiff, and in general, the possessive suffix appears to be unnecessary here. The impersonal sentence properly conveys the idea of the original English sentence.

In one case, in the second article, I decided on the opposite approach. “These may be termed” could have also been translated as “näitä kutsutaan” – a literal translation, “näitä voidaan kutsua”, would have sounded somewhat silly. Nevertheless, as the question is about terms the author of the paper has created and which are not yet in the common use, “kutsumme näitä” appeared to be the best way to convey this.

9a) <u>These may be termed</u> horizontal schizophrenia, vertical schizophrenia, and diffuse schizophrenia. (89)

9b) <u>Kutsumme näitä</u> horisontaaliskitsofreniaksi, vertikaaliskitsofreniaksi ja diffuusiskitsofreniaksi. (89)

All the stylistic decisions were to a great extent ruled by the skopos – as was, of course, everything else in the translations. However, here the skopos was even more visible than in other parts. Translating terminology is, after all, not something where one can take liberties, and even with neologisms the possible choices are not abundant, but when style comes into play, there can be dozens of possible ways to say something. When facing these kinds of problems it is good to have a clear skopos that offers a consistent way to deal with them.

7 CONCLUSION

The goal of this study was to translate two Isaac Asimov's short stories and to investigate the translation process of the fictitious science in them. These two stories, fake scientific articles "The Endochronic Properties of Resublimated Thiotimoline" and "The Micropsychiatric Applications of Thiotimoline", were chosen for this study as they provided more material than some other Asimov's science fiction, and in them the fictitious and real science were very profoundly entwined.

The theories that form the background for this study are Katharina Reiss and Hans Vermeer's skopos theory and Christiane Nord's translation-oriented text analysis model. These theories helped to define the translation task and offered means to approach the analysis of the source and target texts. The concept of skopos was quite useful, as it helped to define what is central in the translation. Nord's model made it easy to further analyse the requirements for the fulfilment of skopos.

The translation of the texts was a long process, and in one way or another it continued during the whole time I was writing this study. The skopos of the translation was decided to be the preservation of the original effect. On the basis of the skopos and the analysis of the texts I concluded that the most important things to concentrate on were style, lexis and composition, all of which partly contributed to the effect. These are also the features I concentrated on in the analysis of the translations.

When I started writing my thesis about translating fictitious science, i.e. the made-up science of science fiction stories, I imagined that it would be somehow clearly separate from the real science. During the translation process I realized that this was not the case – reality and fiction were tightly interwoven. There are of course parts which are completely fictitious – mainly the neologisms – but if we think about the texts as a whole almost everything in them is fictitious, things are just presented in terms of real science.

As a consequence the translation processes of fictitious and real science were as well hard to separate. In the translation I concentrated especially on lexis and style. Especially with style the questions I faced were those dealing with the style of actual scientific articles. In the lexis the problematic words consisted for the most part of real

scientific terminology. The neologisms in the texts also gave me much to think about, but even though some of them were not of the type one would expect to find in a real article (for example willometry) for the most part they were not that different from neologisms that might appear in scientific texts.

It is clear from my experience that the first requirement for scientific translators that is listed in chapter 2.3 (broad knowledge of the subject-matter of the text to be translated) fits quite well also science fiction translation. This is true especially with this kind of science fiction, which is quite heavily loaded with scientific terminology and information. My expertise on chemistry and physics is, in the end, quite limited, even though I have completed basic studies in both. Still, this did not cause any big problems or anything that would have been insuperable.

The area in which my lack of knowledge became most apparent was the translation of scientific terms. Their translation was, of course, for the most part quite a straightforward process, as it often is. Still, there were some terms that required consultation of many different dictionaries and sometimes it took me relatively long to find the correct equivalent. All in all, this was not any remarkable problem in the translation process, simply something that slowed it down a little, as I had to check and recheck everything before finishing the final drafts.

As for the neologisms, in these articles they were quite varied. There were examples of new coinages, compounds and terms that have changed the field they earlier were associated to. The vast majority of the neologisms were based on existing words. Compounds of English and Latin or Greek were quite common. Words of Latin and Greek origin are, of course, common in scientific texts, but there is one combination in the texts that is not of the kind that appears in real articles: *willometry*. This is, basically, the only neologism in which the texts' real nature is visible, the only neologism that one cannot imagine appearing in a serious article, and this realistic nature of neologisms was one thing that reinforced the effect of the articles.

The stylistic questions also required much thought. Even though the aim was to preserve the "turgidity", as Asimov called it, in the translations, my goal naturally was not to use bad Finnish. As a result I tried to find ways to express things that would not be too simple, but still correct use of the language. This was not always that easy, as I

have a tendency to write concisely and with few words, but in the end I believe the result was complicated enough.

Asimov's original articles were written in 1948 and 1953. He wrote the first article at a time he was preparing to write his dissertation to practice academic writing. He went further than that – instead of just practising he wrote something that was so stereotypical academic prose that it qualifies as a parody. As he was working on his dissertation and so had to read innumerable articles, Asimov of necessity must have been very familiar with the contemporary style of scientific articles. Unfortunately I do not have similar knowledge of scientific writing of my time. I do not know the clichés or the conventions the way Asimov did, and this presented one difficulty for the translation.

Nevertheless, I believe I managed to convey the air of the articles quite convincingly in the translations. When a text is being translated, something is always lost, and in the end it is not possible to produce a target text that would be in all ways similar to the source text – but after all, this is not the goal either. The goal is to fulfill the skopos, and I believe I succeeded in this quite well.

One of the reasons I set out to examine these particular short stories was the lack of research they have received. In this study I have been able to discuss their nature only briefly, while I have concentrated on their translation. There would certainly be material to further study in them. On the other hand, these stories represent quite peculiar kind of science fiction, and if one is interested in analysing the science in this genre, there are other, more traditional stories – from Asimov and other writers – that also provide a good source for research.

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