Puzzling translation: Breaking the code

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F	P	H	E	T	N	H	O	E	W	W	E
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- ~~BREAKING~~
- MASTER
- STRATEGY
- ~~TRANSLATION~~
- CIPHERS
- POPCO
- ~~THE~~
- ~~CODE~~
- ~~PUZZLING~~
- THESIS

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Abstract

This thesis examines the translation of puzzles that are used in works of fiction. Within the field of translation studies, not much research has been conducted into the function of puzzles in (contemporary) fiction and even less into the translation problems they might cause. Therefore, it has not been established what translation strategies can be used to overcome them. This thesis will set out to provide solutions to these issues. It argues that puzzles in fiction changes the reader's role and reading experience compared to conventional prose. Instead of a passive one a puzzle changes the reader's role into an active one. The reader needs to be persuaded to become actively involved; the same is true for other types of instructive texts. By explaining the puzzles rules accordingly, using different narratological and stylistic techniques that are compatible with the prose used in the novel, the reader can be persuaded to solve the puzzles.

Works of fiction that feature puzzles will be analysed in order to establish what functions puzzles in fiction serve. In addition, a methodology is developed that enables translators to analyse puzzles in fiction and to decide what translation strategies are most eligible. This will become clear in the short case-study in which the novel *PopCo* by Scarlett Thomas, is analysed and excerpts from the novel are translated into Dutch. By using a domesticating translation strategy, the puzzles are retained in the translation and the reading experience is the same across languages.

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Introduction

> Riddles are rooted deeply in the Western literary tradition. (…) Some riddles demonstrate the wit of a story's protagonist, or allow a character to escape a dire situation by using their brain rather than their brawn. Other, more puzzling riddles simply remind us that some questions are unanswerable, and while this can lead to hours of frustrated head-scratching, these are sometimes the most pleasantly strange riddles of them all. (Crum 2017)

This opening from the article 'Can You Solve These 9 Riddles From Literature' by Madeleine Crum on Huffington Post illustrates that riddles are used in fiction for various effects. These riddles cause translation problems which can lead to hours of frustrated head-scratching, not only from its readers but from its translators as well. The same is true for puzzles, which are also rooted deeply in literary tradition. Many canonised stories and books feature puzzles, such as Edgar Alan Poe's 'The Gold Bug' (1843). Contemporary works of fiction also feature puzzles, such as Douglas Coupland's *JPod* (2006), Dan Brown's novels, David Mitchell's *Cloud Atlas* (2004), Tom West's *The Einstein Code* (2015) and Melinda Nadj Abonji's *Schildkrötensoldat* (2017).

Within the field of translation studies, not much research has been conducted into the function of puzzles in (contemporary) fiction and the translation problems they might cause. Therefore, it has not been established what translation strategies can be used to overcome them. Studies investigating this topic might help translators who are faced with translating a work of fiction containing puzzles. This thesis will mainly focus on the function and translation of puzzles in fiction.

Another author who uses puzzles is Scarlett Thomas (1972), for example in her novel *PopCo* (2004), which provides us with a valuable case-study. Thomas, an English author and professor in Creative Writing at the University of Kent, has written eleven books. Three of her novels - *Bright Young Things* (2001), *Going Out* (2002), and *PopCo* – took her away from genre fiction, and she used them to "explore what it means to be trapped in a culture where your identity is defined by pop culture" (qtd. in Borham-Puyal 151). Her next novel, *The End of Mr. Y* (2006), was her most successful, selling in twenty-two countries. Thomas' books have been translated into twenty-four languages, according to the website of the University of Kent. Only one of Thomas' books has been translated into Dutch, namely *The End of Mr. Y* (*De verdwijning van Thomas Lumas* in Dutch, translated by Susan Ridder).

What makes Thomas' writing distinctive is "her transgression of genres, her penchant for riddles and puzzles and her reaction of (and creation to) a consumerist culture" (Fernández 30). Thomas' interest in puzzle-like elements and riddles form the basis for the story in *PopCo.* The novel tells the story of twenty-nine-year-old Alice Butler, who is a 'creative' at PopCo, the UK's third largest toy manufacturer. The whole company has gathered together in Dartmoor for a conference where some select members of staff are given the task of developing the ultimate product for teenage girls. Brought up by her grandparents (veterans of Bletchley Park and consummate mathematicians), Alice is raised on the wonders of cryptanalysis, ciphers and puzzles. Alice might need her code breaking skills, as she is receiving some odd messages from an anonymous person which are all written in code.

The book has been criticised for having too many storylines, according to Christian House, resulting in "Thomas literally losing the plot" (2004). The book, as Charlie Philips states in his review for The Guardian, "is idealistic, easy to patronise, naive and

unashamedly political. It crams in many more ideas than novel-writing courses would say was appropriate" (2016). However, it is not because of its literary style that this novel was selected for a case-study, but because of the numerous cipher-puzzles that this book contains. Its message is, as Philips puts it: "that the real agents of change around us aren't the advertisers and the demagogues, but the people who love patterns in words and numbers" (2016).

In the first chapter of this study, the characteristics of puzzles in general, their function and effect in fiction will be discussed. In addition, what translation problems the use of puzzles causes, what translation strategies will be applicable, and which are the most eligible strategies for translating contemporary types of fiction without losing the puzzle's function, will be investigated. There are various books that, like *PopCo*, feature puzzles, riddles and encrypted language. Several of these works will be used as examples to illustrate the theory about puzzles and their effects in fiction in the second chapter.

Once the methodology is laid out, I will focus on the subject of my case-study, *PopCo*, to see what function puzzles serve and what their effect on the story is, by analysing the novel. Although *PopCo* has not been translated into Dutch, it was translated into German in 2010 by Tanja Handels and is titled *PopCo* as well. This translation will be compared to the original in the third chapter in order to investigate what translational choices the translator made, and to what effect.

In the following chapter, I will evaluate the theories and strategies discussed in the previous chapters by translating excerpts from *PopCo*, to validate if the translation strategies are applicable in translation practice or if they need to be altered and, if so, in what way. The whole process of all chapters combined will result in a theory that can be

used for translating the puzzles in *PopCo* into Dutch and will lay bare the process of translating puzzles in fiction.

Chapter 1: Theoretical Background

Defining puzzles

The noun 'puzzle' can have different meanings according to the Oxford Living Dictionary; it refers to either "a game, toy, or problem designed to test ingenuity or knowledge" or to "a person or thing that is difficult to understand or explain; an enigma" (OED). Material toy puzzles, such as a Rubik's Cube or a jigsaw puzzle, cannot (physically) be present in a novel. Puzzles in the form of games or problems designed to test ingenuity or knowledge, on the other hand, can and do occur in works of fiction such as *PopCo*.

The definition of puzzles shows many similarities with the various definitions given for (computer) games. For example, Bernard Suits defines 'game' as: "Playing a game is the voluntary attempt to overcome unnecessary obstacles" (qtd. in McGonigal 22). A game player, like a puzzler, is aware of the active role that has been addressed to him from the start. Suits does not specify the 'unnecessary obstacles' that have to be overcome. Mark J. P. Wolf's definition is more nuanced in this respect by stating that in computer games "there is almost always a definite objective that the player strives to complete (…) and in doing so very specific interactions are used" (194). These two definitions of games clarify the rules that structure the experience are an essential part of a game or a puzzle.

It is helpful to establish what fundamental rules constitute a puzzle. Katie Salen and Eric Zimmerman propose in *Rules of Play* a "three-part system for understanding what game rules are and how they operate" (129). These rules are:

a) Operational rules

These are the rules explaining the game, these rules normally accompany board games and other (non-digital) games;

b) Constitutive rules

The logical and mathematical formal structures. These rules are not presented to the players but, according to Salen and Zimmerman, "exist 'below the surface'" (130). These structures form the base of the design;

c) Implicit rules

According to Salen and Zimmerman these are "the 'unwritten rules' of a game. These rules concern etiquette, good sportsmanship, and other implied rules of proper game behaviour" (130).

These rules also apply to puzzles, even though Salen and Zimmerman aim to distinguish games from puzzles "because puzzles have a correct answer or outcome. Think of a crossword puzzle: the puzzle designer creates the correct answer, and the player's activity consists of trying to reconstruct that answer" (80). They continue by explaining that there is no fixed correct outcome in a game such as poker and conclude that "this does not mean that a puzzle is not a game. (…) A crossword puzzle contains all of the elements. (…) It is a system of squares, letters and clues, in which a player follows rules in order to arrive at an appropriate outcome" (81).

The constitutive and implicit rules are part of the puzzle's structure. Operational rules normally accompany a (board) game and are normally provided as a separate text. Jonathan Evans confirms this in his essay on the translation of board games by saying that

"the text of the rules does not form part of the game situation" (17). However, as is the case with puzzles in fiction whereby no additional texts explaining the rules accompany the novel, "the rules do operate throughout the play of the game" (Ibid, 18). Whether the rules are provided in separate texts or not, they are essential to game play, i.e. solving puzzles. "The rules offer a framework for play but the game as played exceeds a reading of the text of the rules" (Ibid, 16). It is precisely for this reason that rules explained in fiction are a form of participatory texts. The operational rules are generally categorised to the domain of instructive texts, because by giving instructions they explain the puzzle. These instructive texts do contain persuasive features because, as Vandepitte claims, "the writer's aim is for the reader to be able to do something" (70).

Vandepitte claims that translating instructive texts requires specific translation strategies in order for source and target texts to show functional equivalence (78). She concludes that "translating instructive texts is translating positive audience-orientation and it is translating expertise" (79). The positive audience-orientation is, among other things, accomplished by addressing readers personally. Readers "find themselves in a positive atmosphere which keeps their interest going" (Ibid, 71). Persuasion is an important criterion for choosing a specific translation strategy according to Vandepitte. This will probably be true for the instructive elements of puzzles in fiction as well.

Puzzles in fiction

According to Evans "in-game text and the text of the rules are bound together as constitutive of the game, but they remain distinct in their presentation" (19). With puzzles in fiction the explanation of the rules in prose and the puzzle itself are also bound together,

but these are not distinct in their presentation. The fictional texts studied within this thesis are all novels. The term fiction refers to what Talbot describes as: “stories that do not pretend to be about real events” (5). Non-fictional works, that are included in a more general understanding of fiction, are excluded from this study. In both fiction and non-fiction, the puzzles, its rules and their solutions are real. However, in fictional texts the rules are explained and operate in a world that differs from reality. The rules of puzzles in fiction are part of the fictional story world (i.e. ideational level (Koster 2011)) and are therefore used in a different way to puzzles in their own right or puzzles used in non-fiction. Consequently, the stylistic characteristics used in works of fiction compared to other puzzles, demand a different skillset from writers, and by extension, translators.

In their study of aspects that engender enjoyment in narratives Green et al. confirm that “poorly constructed narratives do not help readers to enter the story world” (320). Fiction operates differently in this respect than instructive texts in their own right, although comparable persuasive elements may be used. Readers turn to fiction to be taken away from their everyday lives and into a fictional world (Green et al. 311). The writer’s craftsmanship is one aspect that engenders this enjoyment of narratives. This “craftsmanship may also involve the use of stylistic techniques or literary devices” (Ibid, 320). It is the use of these techniques and devices that persuade the reader to keep going and solve the puzzle. Therefore, the explanation of the puzzle’s rules, the puzzle’s design and the way in which it is presented to the reader in the story, have to be compatible to puzzles in reality.

The use of a specific personal narrative and the use of personal pronouns can be a decisive factor for a reader to be persuaded to engage in solving the puzzle or not. By using the second person pronoun, the reader is directly addressed and the instructions are

therefore also addressed to the reader instead of to a character. When puzzles occur in fiction it is important to understand the implications of using either first, second, or third-person narratives. It is to be expected that the reader will be directly addressed when the puzzle's rules are explained, as is the convention in instructive texts.

Focalization is another valuable narratological technique to instruct the reader to work on the puzzle (i.e. explain the operational rules). According to the website of the University of Hamburg, the term focalization was coined by Genette. "Genette distinguishes three types or degrees of focalization — zero, internal and external —" (2013). The term *zero focalization* refers to narratives with an omniscient narrator; stories where the narrator knows more than the character or at least expresses his knowledge more than the character. *Internal focalization* refers to narratives where the narrator is a character and *external focalization* refers to narratives where the narrator knows less than the character. In the latter form of focalization, the character itself and events are described from an external perspective. Using the first, second or third person narrative conveys how the rules are explained and to whom. Past tense is less effective to persuade the reader to take action. In instructive texts the persuasive features are directive and it is to be expected that these are written in present tense.

Puzzles in fiction, comparable to board game rules, need to be written (and translated) "in such a way to produce the most easily usable text" (Evans 21). It is therefore important for a writer to know the implied reader. Whilst writing, the author has an ideal reader, or a certain hypothetical reader in mind, and addresses his work and its message to that reader. This is what is considered as 'implied reader'. The register that is used needs to be in accordance with the implied reader. If the register is too high or too low the puzzle might be too difficult or too easy to solve and the reader will become less engaged to the

story. By understanding the effect of the stylistic techniques in addition to understanding the conventional rules of puzzles, the puzzle itself and the explanation of its rules will come across as craftsmanship. Readers are able to immerse themselves in the narrative world because the construction of the fictional world is a faithful adherence to reality. If the construction of the fictional world does not meet plausibility criteria (i.e. is not logical or breaks its own set rules), the willing suspension of disbelieve (Colerdige 1847) is yielded.

In an increasingly digital age more academic research has recently been conducted into interactivity, playability and translation in new media such as video games. Green et al. mention that "technological advances have made interactive narratives (for example, some video games or virtual reality simulations) more common" (322). Before the increase of video games and studies within that field, research into how puzzles have been used in novels has been conducted with regard to the literary group Oulipo, founded in 1960. Like Edgar Allan Poe, who, according to Ruiz, claimed he composed his works of fiction and poetry following a perfectly logical scheme (Ruiz 10), Oulipo members claim mathematics play a major role in the creation of their literary work. Examples of works that include puzzles and stem from the Oulipo mindset are Georges Perec's *La Vie mode d'emploi* and Martín Sánchez's *Fricciones*. The reason Oulipo members used puzzles, according to Martín Sanchéz, "is the members' common goal to break down the traditional literary tendencies in order to focus on the journey or process of the work, and less on the final product itself" (qtd. in Calhoun 8).

Oulipo's intent is to push the boundaries of genre and embrace the constraints that are placed on the author. The reading experience of a work of fiction written according to Oulipo tradition is less of a routine process, but more of an entertaining and engaging exploration. Both author and reader are actively engaged and are therefore moved into a

more experimental work of fiction. Allison James explains that Oulipo's "collective goal is not to propose a set of general, authoritative rules of literature but rather to explore the creative possibilities of various literary forms" (14).

With a puzzle comes the implication that there is work to be done by the reader, because a puzzle needs to be solved. Findings from studies into Oulipo, such as the studies from Ruiz and James, imply that all works of fiction using puzzles make the reading experience a more active one opposed to a passive one, as is the case in conventional fiction. This is always the function of a puzzle in fiction. Based on comparing some novels featuring puzzles, such as *JPod* and *La Vie mode d'emploi,* two more functions of puzzles in fiction can be distinguished, depending on the frequency and timing of puzzles in fiction. Within this study three overall functions were found. Puzzles in fiction can serve one or more of these functions. These functions will be leading in the further investigation to what translation problems these puzzles and their function cause. These three functions are:

1) *Intending interactivity*

Puzzles in their own right are interactive texts. The puzzle's aim is always to be solved by the reader. This interactive element of a puzzle is always adapted to a novel if a puzzle occurs within the story. When a puzzle is used in a work of fiction the reader's role changes from a passive to an active one.

2) *Reinforcement of a story element, local use of puzzles*

The timing of the occurrence of the puzzle in the story, the character to whom the puzzle is presented or the reason why the puzzle is presented are decisive aspects for the function the puzzle serves on the ideational level or plot of the story. If the same puzzle is only

presented once, regardless when, it functions as an element that helps to create the fictional world and reinforces a specific story element. The puzzle is local and does not affect the plot of the whole story but only the part where it is used; for example, in order to create empathy with the character(s). Attachment to the fictional world is a persuasive feature in fiction, as Green and Brock found in their study. They claim "attachment to a protagonist may be an important determinant of the persuasiveness of a story. (…) Readers may not only enter a narrative world, they may also become highly involved with the people they find there" (702).

The main requirement for a puzzle to function locally, is that not solving the puzzle does not interfere with the further story development, i.e. the story's plot. The puzzle's solution is either given straight away or not needed at all for the overall story development.

3) Plot development, structural use of puzzles

A puzzle in fiction can be used as a means for plot development. Solving the puzzle bit by bit is what moves the story forward. The unsolved puzzle functions as the 'inciting incident', meaning that "some event is necessary to get a story rolling" (Vogler 99). When a puzzle functions as the inciting incident, it is most likely that the puzzle is presented somewhere at the beginning of the story. The puzzle and clues leading to its solution, are structurally presented throughout the story. The solution and majority of clues are not given straight away and kept separate from the puzzle, as is conventional with puzzles in general.

Suspense is created by keeping puzzle and solution separated. Dirk Delabastita describes suspense as a "rhetorical device or effect in fiction" (28). Suspense is distinguished from surprise, because surprise "does not involve the creation of expectations which the text is then slow to fulfil or frustrate" (Delabastita 28). A puzzle is slow to fulfil its

expectations when the solution is not given straight away. Suspense and also mystery and surprise all come into play if a puzzle is used in fiction. Suspense, mystery and surprise are distinct, yet at the same time closely related because "all three thrive on temporality and causality, on the interplay of cognition and emotion, and on audience participation" (Ibid, 28). A puzzle also thrives on audience participation. Therefore, a puzzle that functions as plot development always adds suspense to the story, even though the novel does not have to be a mystery novel. Narratological and stylistic techniques need to be chosen considerably. For instance, zero focalization will be a type of focalization less used in fiction where solving the puzzle is part of the plot. An omniscient narrator may break the convention to keep puzzle and solution separated.

How the narratological devices work also needs to be taken into consideration while translating suspense. Anna Espunya states: "Given that translation involves a reconstruction of the source text's content and style using the resources of a different language, it is to be expected that the building of suspense may be affected by certain translator and copy editor choices" (193). The function a puzzle serves in a work of fiction affects the narratological techniques used to construct the fictional world and puzzle therein.

Translating puzzles

Understanding how a puzzle operates in a work of fiction is helpful to translators. However, the translation process is not to be underestimated according to Alan Connor, who states:

> if you're an experimental novelist with, for whatever reason, a grudge against translators, you might consider creating a book featuring a puzzle in which clues, the entries and the way they intersect are vital to the plot. A

> translation of the clues would be likely to necessitate a different grid and vice-versa. (2013)

It is true that translating a puzzle might require altering the puzzle itself or the explanation of the rules in order for the playing (i.e. solving) experience to be similar. In other cases "all that is necessary to create a foreign language version of a game is a translation of the rule book" (Evans 19). In case of puzzles in fiction there is no rule book, however the rules are explained in the prose, with as result that only the prose has to be translated instead of the puzzle itself. Only the explanation of the rules need to be changed when number or mathematical puzzles are used. Mathematics, according to Ruiz, "has been conceived or imagined by writers, especially as both the perfect opposite and complement of literature, and as a universal language transcending language differences" (iii). Numbers can be considered as the opposite of prose, because they are universally understood since the numbers' meaning is the same in most languages. Evans confirms this is also true for certain board games:

> Chinese Chess shows a possibility of resistance to translation in games: the Chinese characters can be viewed as just abstract symbols required to be learned to play the game. This aspect reinforces the idea that games have a playable form which is not language bound [sic]. (22)

The opposite is true for different types of puzzles. Alan Connor confirms this regarding crossword puzzles by stating "for a love of crossword is a love of language" (2013). Puzzles, except for number puzzles, are dependent on the language they are written in, as Connor also confirms: "The crossword is not ubiquitous – some languages do not take kindly to being broken into pieces and plotted in interlocking squares. (…) It seems quite probable the

English language has more words than most comparable world languages" (2013). Connor explains the English language having more words because it is a "*mélange*". Since English is a Germanic language, English words that are Germanic in origin may have usable alternatives originating in French or Latin. Translators who translate a work in a Germanic language, such as Dutch translators, may have a lot of flexibility when translating a puzzle.

Translators in general do have a lot of flexibility when translating a puzzle in fiction; not only is it possible for the translator to alter the semantics or syntax of the prose that is used to explain the rules, the puzzle itself can also be altered, or in O'Hagan's words "transcreated" (212). Transcreation is described by Mangiron and O'Hagan, as considerable "translator freedom granted to the translator" (2006) in translating games. Since puzzles, comparable to games, can be altered and also set out to implement an interactive element in a story, they too can be transcreated by translators. The amount of flexibility depends on the translator's aim. A translator's intention might be to make a copy of the original, aiming for absolute precision and coherency. When this is the translator's intention, the translator will choose a more literal approach.

If the translator's main intention is to construct a similar experience for the target reader but also intends to recreate a new perspective of the original, the translator's approach may be more creative. The translator's greatest challenge is to produce a clear and coherent text while simultaneously successfully recreating the intent and mood of the original work. Keeping the balance between the two is a delicate process; if the translator interprets an idea incorrectly the balance is lost. In the case of translating puzzles, the translator has to be able to understand the puzzle's structure, recognize the clues, interpret the puzzles meaning and recreate the puzzle and its textual function. The translation of

puzzles, similar to (board) games, sets out to be “playable” (Evans 16) or rather solvable. Key elements in their translation are “clarity and usability” (23).

The translator’s first task is always to determine *what* needs to be translated, before *how* it needs to be translated. In the pre-translational stage, the source text is analysed in order to establish who the author is, to what genre the text belongs, what style is used, etcetera. By analysing the source text in the pre-translational stage, the text’s meaning, i.e. intention, becomes clear. The translation also intends to reproduce the same effect and mood that the reader experiences while reading the original. Choosing which translation strategy will be applied greatly depends on the knowledge the translator has about the implied reader of the translation (Chesterman 167).

The findings from the source text analysis help the translator to establish what stylistic and narratological elements operate throughout the text. Geoffrey Leech and Mick Short’s theories on style will be followed when analysing the original text. Leech and Short distinguish three levels of organisation that make up the communication system of language: semantics, syntax and graphology (95). According to Leech and Short, all texts have individual qualities. It depends on each specific text which features are unique and significant. “There is no infallible technique for selecting what is significant. We have to make ourselves newly aware, for each text, of the artistic effect of the whole, and the way linguistic details fit into this whole” (60). Leech and Short place categories for analysing style in fiction under four general headings: lexical categories, grammatical categories, figures of speech and cohesion, and context (61).

As discussed in this theoretical framework, it is important to understand the puzzle’s function in the story and what narratological techniques are used to encourage the reader to interact with the story. After analysing the source text in general, the puzzle(s) need(s) to

become the subject of analysis in order to determine which translation approach need to be used to retain the puzzle's function in the translation. The analysis methods that will be used are laid out in table 1.

Analysing stage		Questions that have to be answered
1) Text analysis	**General**	Who is the author? What is the premise of the story? Who is the implied reader? What are the narratological and stylistic qualities of the text (analysis according to the model of Leech & Short)?
2) Puzzle analysis	**Type of puzzle**	What type of puzzle is presented? How does the format differ from the text?
	Narratological devices (plot, timing, focalization, grammatical subject etc.)	Where in the story does the puzzle occur? Is the puzzle only presented once or multiple times throughout the story? Is there only one puzzle or are there several? In case of multiple puzzles, are they different kind of puzzles or all the same? By whom and to what character is the puzzle presented? Are there any clues given on how to solve the puzzle? If so, how are these given and on what point in the story?
	Solution	Is the solution given? If the solution is given, when and how is it given?

Table 1: Method for analysing puzzles in fiction

All works of fiction featuring a puzzle change the readers role from a passive to an active one as the meaning of the text does not emerge in a traditional, linear manner. There are three main categories of translation strategies that are capable of solving different

translation problem such as the translation of puzzles. The puzzle is either retained in the source language, retained and translated in the target language or the puzzle is omitted altogether. The translator decides on the most eligible strategy by establishing how the puzzle operates and what function it serves in the story, thus which specific translation strategies are required in order for source and target texts to show functional equivalence. In addition, the translation strategies that are eligible for translating the puzzles rules and clues can be chosen accordingly. It is exactly because all these aspects need to be considered that translating a book featuring a puzzle, according to Alan Connor, is a "daunting task" (2013).

There are different types of puzzles on which the theory and methodology are applicable, but not all puzzles can be taken into consideration within the limited scope of this research. The constitutive rules of the puzzle need to be adaptable. If a puzzle's design cannot be altered, the interactive element the puzzle adds will be less apparent. The narrator is the only one able to solve the puzzle since only the prose can be altered. Consequently, the puzzle does not function the same way a puzzle normally does.

Cryptography, according to the Oxford Living Dictionary, meaning "the art of writing or solving codes", is a type of puzzle that meets the requirements described above. It differentiates from the body of text because of the alternative grammar rules or the coded message is written in numbers. Cryptography is often linked to mathematics because the encoding, as well as the decoding process, are based on a mathematical theory. The theory, or the key to decipher the code, has to be explained in order to break the code. Therefore, encrypted language is understood as puzzle. One exception would be an optic illusion because the image cannot be altered and the puzzle itself therefore cannot, in O'Hagan's

words, be ‘transcreated’ and requires different translation strategies. What specific translation strategies are applicable on puzzles in fiction will be investigated next.

Chapter 2: Analysing translated puzzles in fiction

In order to illustrate what translation problems puzzles might cause, three examples of puzzles from different novels and their functions will be analysed. After analysing the original, the translations will be compared to the source texts. By comparing the source texts to the translations, it will become clear what translation strategies can be applied when translating puzzles and if the translation strategies used produce a clear and coherent product that reproduces the same effect and mood that the reader also experiences while reading the original.

The Lost Symbol

The Lost Symbol (2009) by Dan Brown, is a mystery/thriller told in third-person narrative. In this story, the protagonist Robert Langdon is summoned unexpectedly to deliver an evening lecture in the U.S. Capitol Building. Shortly after his arrival, a disturbing object – artfully encoded with five symbols – is discovered in the Capitol Building. The story develops and Robert Langdon finds himself in a real-world labyrinth of codes and secrets, to which he has to find the key in order to solve this mystery.

Several cryptographic puzzles occur in this story. Most of the puzzles are written in numbers or symbols, a few in letters, but all are encoded. The first puzzle is presented at the beginning of the story, as soon as Robert Langdon arrives at the U.S. Capitol building. The puzzle is presented to Robert Langdon, Inoue Soto and Trent Anderson; who leads them to the puzzle is unknown and part of the mystery. A lot of dialogue between the characters is used when the puzzles are presented in the story. Through this dialogue, the manner in which the puzzle operates is explained. Because Brown uses dialogue to present the rules, a

shift from third-person narrative to first-person narrative occurs. When the characters address each other, the second and first-person plural pronouns are used. However, the reader is never directly addressed or persuaded in becoming involved in solving the puzzle. The main function the puzzles serve in *The Lost Symbol* is developing the plot and thus the creation of suspense.

The solution to each puzzle is not given straight away. The characters, mainly Langdon, puzzle throughout the story, each time finding new clues. When a puzzle is solved, its solution (i.e. the decoded message) holds a clue to solving the next puzzle. All puzzles are part of one bigger puzzle and solving this puzzle is what moves the story forwards. The first puzzle is the inciting incident.

Translation: *Het Verloren Symbool*

In the Dutch translation of *The Lost Symbol*, *Het Verloren Symbool*, all original puzzles have been retained. No puzzle was omitted, which would have had an impact on the overall story, since the plot development is surrounded by the puzzles and their solutions. The third-person narrative is also used in the translation. The first-person narrative is also used in the dialogue of the translation. Similar to the source text, the reader is not directly addressed in the translation.

All puzzles in the translation appear to be equal to the ones in the original. The puzzles' designs are not altered in order for the puzzles to function in the translation. None of the puzzles rules or clues are changed either. With cryptographic puzzles, this means the way they are encrypted and the key to decipher the code are the same. When they are written in Latin in the source text, the solution is presented and then explained in the source language. The same technique is applied in the translation.

The puzzles of which the outcome in the source text is written in the source language are also written in the source language in the translation. For example, the message “The secret hides within The Order” (259) is presented first. It is followed by the Dutch translation in parentheses, “(Het geheim schuilt in het hart van De Orde)” (259). Also, *in het hart* is added to the translation, as it is needed later in the story. A hidden Bible, that is believed to enhance human knowledge, is found in a deep cornerstone of the Washington Monument, to what ‘*in het hart*’ refers to.

The puzzles themselves are not translated into Dutch. This is not always necessary, as the puzzles in the original are presented and explained in the same way. However, the reading experience for the target reader differs from the original reader. The target text provides more explanation. The puzzle’s solution is not only provided but made more explicit. In the given example, it already contains more clues to the next puzzle, resulting in building less suspense and asking a less active approach from the reader.

JPod

The novel *JPod* (2006) by Douglas Coupland is based around the everyday life of Ethan Jarlewski and his team of video game programmers whose last names all begin with the letter 'J'. In JPod, Ethan and his co-workers wage battle against the demands of the marketing staff who torture them with idiotic changes to an already absurd game. The book opens with a pair of pages written in computer programming code. Before the start of the first chapter, the words ‘click here’ are written on the page. An interactive element is already added to the story, as it seems the reader has a choice to either click (i.e. turn the page and start reading) or not, similar to an internet page or email.

The story is told from Ethan's point of view, using first-person narrative. Several games and puzzles occur in the story. The workers at JPod get bored easily and challenge each other by playing games or solving puzzles. Both games and puzzles stand out from the prose because their format differs from the text. The puzzles are always presented by one of the workers at JPod to the other colleagues. Various types of puzzles do occur, some are number puzzles and others are word puzzles. The rules of the puzzle are always explained in dialogue. The solution to the puzzle is rarely provided. Puzzles are presented throughout the story. The solution of one puzzle does not lead to another puzzle, therefore the puzzles do not function as plot development. Their function is to engage the reader in the group of workers at JPod. Ethan even speaks directly to the readers whilst explaining one of the puzzles. One of the co-workers, Bree, prints out a list of 972 three-letter words allowed in Scrabble. She has added one non-regulation word to the list. Before presenting the list to the reader, Ethan says: "Herewith Bree's list. Let it be noted that Microsoft Word's spell-check rejects most of them, so, then, how real *are* these words?" (292). Ethan shares this information only with the readers of *JPod* and does not address this to his colleagues on the ideational level. This either invites readers to actually enter these words into Microsoft Word or readers 'trust' Ethan and decide to believe Ethan on his word. Ethan explains the implicit rules to readers; it would be considered cheating to insert the words in Word and solve the puzzle that way.

Readers can then try to solve the puzzle, like the characters in the book. Solving the puzzle may provide pleasure for the reader, the same way solving a puzzle outside of fiction does, but readers can also decide to leave it unsolved, as the answer is not needed for the further development of the story; it is merely in the book so the reader can feel part of the

group. The puzzles in *JPod* occur locally, they add an interactive element and reinforce the creation of empathy with the characters.

Translation: *JPod*

The Dutch translation of *JPod*, also titled *JPod* (2006), is translated by Dennis Keesmaat and Nan Lenders. All puzzles have been retained in the translation and no puzzle was omitted. The Dutch translation also opens with a few pages written in computer programming code and the page which has *klik hier* ('click here') written on it. The same grammatical subject as in the original is used. In the Dutch translation, Ethan also addresses the reader directly by saying: "Hier volgt Brees lijst. Laat gezegd zijn dat de spellingchecker van Word de meeste niet goedkeurt – dus hoe echt zíjn deze woorden eigenlijk?" (246).

The implicit rules themselves and the manner of explaining all puzzle rules are equal to the original. However, the puzzle itself and its solution have been translated into Dutch. In the Dutch version of *JPod*, there are only 937 three-letter words. The words themselves have also been changed to all three-letter words that the Dutch version of scrabble recognises as such. For example, in the Dutch version the word *ZUS* occurs, whereas it does not in the original. The one non-regulated word was also changed from *EMF* to *ELP*. It did not need to be changed as the word is non-regulated in both English and Dutch. The reason for changing this word in the Dutch translation might be to retain the appearance of the puzzle and its solution in both languages; the answer can be found in the centre of the page.

By altering the puzzle and outcome to be compatible in the target language and culture, the puzzle keeps its function and the reading experience is the same for the target reader as it is for the source text reader.

La Vie mode d'emploi

Georges Perec's *La Vie mode d'emploi* (1978) is often classified as postmodern fiction. Perec, a cruciverbalist himself, was one of the core members of Oulipo. The novel consists of interwoven stories and ideas based on the lives of the inhabitants of a fictitious Parisian apartment block, 11 Rue Simon-Crubellier, between the time period of 1833-1975. The whole story is constructed as a puzzle that reveals itself chapter by chapter, describing the lives of the characters, some of which are puzzle makers, by an omniscient narrator. The apartment block on 11 Rue Simon-Crubbellier exists of a hundred rooms that are arranged in Graeco-Latin squares or 'bi-squares'. Each room and character are individually described in one of the 99 chapters of the novel. Throughout the whole book puzzles, acrostics, problems of chess and logic, crosswords, and mathematical formulae are used, all for the reader to solve. The solutions are not provided. Consequently, the story does not need to be read from back to front, although it can be. If the reader decides to solve the puzzles presented in the novel, the story will be read according to the Latin squares principle.

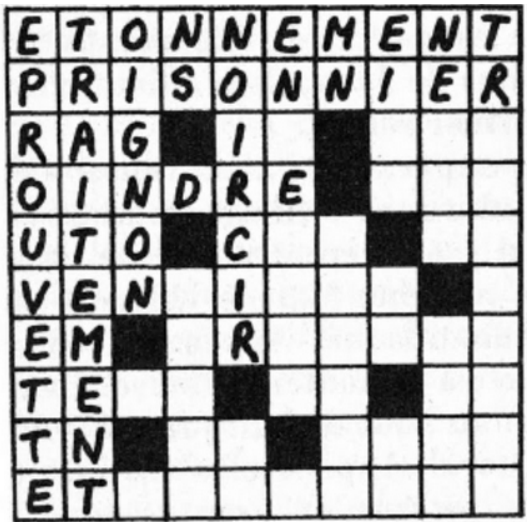
In Perec's novel, the puzzles function on all three levels; they implement an interactive element, by solving the puzzles the plot development differentiates from the traditional reading experience from front to back and therefore adds suspense, and the fictional world is filled with and constructed by puzzles. Characters in the novel either create puzzles or try to solve them. It is not necessary for the puzzles to be solved; the story develops either way. However, if the reader decides not to solve the puzzles, the reader's role will remain a passive one instead of becoming active and the puzzles will lose their functions.

Translating a work of fiction in which puzzles serve multiple functions may be complicated, since all functions of the puzzle need to be taken into consideration. In the Dutch translation *Het leven een gebruiksaanwijzing* (Edu Borger, 2016), all the puzzles are translated into Dutch. By doing so, entries and outcomes have to be translated which results in the transcreation of the puzzle's design. This becomes most apparent in the crossword puzzle that features this story.

The nurse of one of the character's, Madame Moreau, filled in two of the entries of the puzzle. In the original these entries were 1 across and 3 down. In a later chapter, describing one of the other characters of the Altamont family, the crossword puzzle is shown and filled in further. All of this is translated and changed accordingly. The entries the nurse of Mevrouw Moreau filled in are *7 horizontaal* ('7 across') and *5 verticaal* ('5 down'). The whole puzzle's appearance has changed to make the crossword work in Dutch. Perec was aware of the translation problems this puzzle would cause and "furnished his German translator Eugène Helmé with notes about the novel's wordplay. In case of the crossword, his instructions were that only *etonnement* and *oignon* mattered" (Connor 2013). The translator was free in translating the other entries in order to make the puzzle's structure work and without losing the puzzle's function in the story.

The Dutch translation did not keep the entry of *oignon*, but it was translated to *uit* ('out') instead of *ui* ('onion'). It is not necessary for the puzzle to work to add the extra letter and thereby changing the meaning of the word. The translator could have inserted a black square to the grid, in the space following *ui*. Possibly, the translator did not receive the same instructions provided to the German translator by Perec, or simply did not have the opportunity to compare his to other translations. If a solution to a (crossword) puzzle is not

provided it might be convenient to either consult the author or, if available, different translations. The task of translating the puzzle and retaining the puzzle's function and the overall reading experience will become less daunting.



Crossword from *La Vie mode d'emploi*

Crossword from *Het Leven een gebruiksaanwijzing*

Expectations

The substantial translation problem that a puzzle causes seems to be a shift in the reading experience. In his article 'De brug bij Bommel herbouwen', James Holmes states that the

translator needs to decide beforehand on either using a foreignizing or domesticating translation strategy (185). The decision is based on the aim of the translation matching the original to a degree that it will be considered a translation (Holmes 187) and, secondly, must be of such nature that the puzzle will be considered a puzzle. Consequently, this results in either changing the puzzle's design, entries and/or solution, as in *La Vie mode d'emploi*. When the translator chooses a domesticating strategy for the prose but a foreignizing strategy for the puzzle, as was the case in the translation of *The Lost Symbol*, additional translation strategies such as clarification are required. However, the (negative) implication of adding an explanation is 'explication' and 'extension' (Berman 266) of the text. The interactive element of the puzzle, its main function, may be lost because of the explication.

Based on the analysis of the novels using puzzles and comparison to the Dutch translations, it appears that a domesticating translation strategy is the most desirable to solve the translation problems. If this is done properly, the puzzle functions the same way as the original puzzles do and the reading experience will be the same. This is the aim I set out for translating a work of fiction that features puzzles; to produce a clear and coherent text that at the same time successfully recreates the intent and style of the original work.

Chapter 3: Analysis

Source text analysis of *PopCo*

PopCo is a contemporary work of fiction. The story is built around the life and work of twenty-nine-year-old Alice Butler, who lives and works in London. The real world and society are depicted through Alice's eyes. Her unconventional childhood – she was raised by her famous code-breaking grandparents because of the death of her mother and disappearance of her father – and aversion from corporate life and marketing strategies question how today's society is structured. Consequently, *PopCo* questions pop culture and its impact on society and literature alike, which, according to Borham-Puyal, is one of the most obvious concerns of contemporary fiction (145). Although Thomas' work addresses these concerns, her "fiction is not a place to find the answers to all questions, but a means by which to explore all the interrogations" (Ibid, 153). The journey, i.e. reading experience, is more important than the story's ending. The same is true for works of fiction written according to Oulipo tradition. This aim characterizes Thomas' style of plotting. Broham-Puyal states that Thomas, as a teacher in creative writing,

> remains particularly conscious of the boundaries established for story-telling, and the way in which authors can and should subvert them in order to experiment with form and matter, (…) which playfully challenge the reader's literary expectations. (146)

Another characteristic of Thomas' style is her aim to raise important questions in her novels by using simple syntactic structures (Thomas 2012: xi). In her novels about postmodern culture she replaces grand narratives by cheap narratives that contain references to contemporary pop-culture.

The story uses the first-person present tense. The novel uses flashbacks to Alice's childhood memories, which are also told in first-person present tense. On a graphological level, the start and the end of a flashback are marked by either the beginning of a new chapter or an asterisk. The focalization remains internal throughout the story. The narrator is Alice, either as an adult or as a child. The register that is used differs between Alice as an adult and younger Alice. Younger Alice's register is more childlike, using childish exclamations such as 'gosh' and sentences like "my tummy feels tingly" (Thomas 2004: 199). Older Alice uses a register that is in agreement with the register a British person in their twenties would have used in the 2000's. Her exclamations are stronger; adult Alice uses swear words, including 'fucking hell' as exclamation of anger.

The implied reader is also an adult person, probably in their twenties. However, to today's reader in their twenties some of the pop-culture references may feel outdated, at least more outdated than they would have felt to a reader of that age about fifteen years ago. When Thomas' novel *Bright Young Things* was published, one of the reviewers pointed out to her that the book would date easily because of the temporary references in it (Thomas 2012: xiii). Thomas herself claims: "[I]t's true that many expressions are now extinct, twelve years on. (…) But a lot of pop-cultural space junk has survived" (2012: xiii). Some of the references in *PopCo*, for instance to specific television programmes or advertisements, may also be culturally bound. It is important to take the temporal and cultural translation problems this causes into consideration. These temporal and cultural translation problems are, besides the translation problems caused by the puzzles, the translator's main challenge while translating *PopCo*.

Two plotlines are intertwined in *PopCo*, one from Alice in the present and from younger Alice. The plotline of Alice in the present revolves around the events at the PopCo

Conference. Younger Alice's plotline revolves around the mystery of the Stevenson/Heath Manuscript and the hunt for the treasure solving this mystery leads to. The two storylines are linked by puzzles. In her book *Monkey with Typewriters* (2012), Thomas states that at the moment she was about to start a new novel she wanted to write something more ambitious than she had written before (2012: 192). She wrote down a list of everything she was remotely interested in at that time. The list contains code-breaking, crosswords, mathematics and interactive elements. The total list consists of eighteen items of interest (for the complete list see Appendix A). Thomas set herself a challenge: "I was to make a meaningful novel out of all those things – all of them, mind – and in so doing, work out how they were connected" (Thomas 2012: 192). It is the use of puzzles that connected all topics in the novel.

Using two plotlines, both using puzzles, already suggests more than one puzzle occurs within this story. The first puzzle, an encrypted message, initially seems to function as the inciting incident. However, the solution is given shortly after the puzzle itself is presented. Alice finds the message and, since she is the internal narrator, uses this puzzle to explain cryptographical puzzles' rules (the implicit, constitutive and operational rules). She starts by explaining mono-alphabetic ciphers. In mono-alphabetic ciphers, each letter from the standard (plaintext) alphabet is replaced with another letter from a corresponding alphabet. 'Caesar shift ciphers' are mono-alphabetic ciphers. One of the most famous contemporary uses of such a Caesar shift cipher is, as is also mentioned in *PopCo*, the fictional computer HAL from *2001, A Space Odyssey*. Using a Caesar shift of minus-one, HAL is enciphered to IBM. Only considering the Latin alphabet, the same word can be spelled in twenty-six different ways.

After explaining and providing some examples of mono-alphabetic ciphers, Alice continues by explaining the more complicated poly-alphabetic ciphers. Poly-alphabetic ciphers use several alphabets at the same time. In order to be able to decipher the message, one has to know the key word that was used to encipher it with. By writing the keyword above the cipher message and then by locating both letters in the Vigenère square (a table of all the different poly-alphabets that are used), a reader is able to decipher the message. Alice uses several examples of poly-alphabetic encrypted messages to illustrate how this method works by using the Vigenère square. The message Alice received uses a poly-alphabetic cipher. The keyword that is used is PopCo.

The next puzzle that occurs, one presented to younger Alice, is the real inciting incident for the plot. This puzzle occurs immediately after the first encrypted message is received by Alice, which occurs towards the beginning (in the seventh chapter on page 62). Younger Alice wears a necklace which has 2.1448156Ex48 engraved in it. The final solution to this puzzle is not given within the story. By being given the solution to most of the other ciphers and being given explanations on how they operate and can be solved, readers may come to understand how this puzzle operates. Presented in the novel's postscript, the solution turns out to be a prime factorization. Alice solves the mystery in the story, but "Thomas's reader is not so fortunate" (Borham-Puyal 154). By the end of the novel, Alice has discovered what book and what edition was used to encipher the Stevenson/Heath Manuscript. Her necklace provides the answer. However, the title of the book is never given and the mystery surrounding and Alice's necklace and the Stevenson/Heath manuscript is upheld.

Aside from the puzzle on Alice's necklace, all other puzzles are used locally. Some puzzles are solved, while others are only explained. The latter ones are presented to

illustrate how other, more complicated, puzzles operate. These local puzzles that appear in the story help to construct and explain the rules of play of the fictional world. According to Borham-Puyal, "it is relevant that the fragments of code-breaking (…) are non-focalized and seemingly unnarrated" (155). Thomas claims she has written these fragments in a style that "simultaneously claims authority while admitting that much is known and all else is conjecture" (qtd. in Mondor, 2007). The hypothesis that fragments explaining puzzles' rules of play directly address the reader, as is conventional in persuasive texts, does not seem to hold in *PopCo*. However, whenever a puzzle is presented to younger Alice, she always seems to have an audience consisting of her grandparents. The presence of her grandparents enables younger Alice to ask questions and receive a simple explanation, comprehensible even for juvenile readers. The code-breaking fragments seem to be especially focalized instead of non-focalized. Although Thomas sets out to make the code-breaking excerpts non-focalized, the reader is addressed directly by Alice. Vandepitte's findings that instructive texts (or text fragments in this case) contain typical persuasive features seem to be true for puzzles in fiction as well. The novel also features a crossword puzzle at the end. Adding this crossword reinforces the interactive element of the story but is not needed for the story development.

German translation of *PopCo*

The German translation, also titled *PopCo* (2010), will be compared to the original in order to investigate what translational choices the translator made, and if the chosen translation strategies will also be eligible for the Dutch translation.

The German translation also retains the internal focalization and the first-person present tense. The original sets out to highlight the objectiveness of the code-breaking

fragments by non-focalizing these fragments, however the second-person narrative is used in the explanations of puzzles that are not explained to other characters: “You are never going to crack this with frequency analyses or guesswork” (86). Tanja Handels has opted to address the readers indirectly by using *man* (‘one’): “Mit Häuftigkeitsanalyse oder Detektivarbeit kommt man da nicht weit” (141). In other cases, she has omitted the form of address and generalised the sentence:

> ***English***: “You then use the letter of the keyword to determine which ‘line’ of the Vigenère square you will use to encipher the letter below it” (86).

> ***German***: “Die Buchstaben des Schlüsselwortes geben dann an, welche Zeile des Vigenère-Qudrats dazu verwendet wird, den darunterstehenden Klartexrbuchstaben zu verschlüsseln“ (141).

The persuasive feature or addressing the reader directly is not retained in the translation. This may be explained by either lack of prior knowledge on how these features operate or because this is the convention in German instructive texts.

The puzzles that occur in the original also occur in the German translation, except for the crossword puzzle at the end. The crossword puzzle is omitted in the German translation. None of the puzzles in the novel are translated into German. All puzzles, keys and solutions are in English. If the code is cracked, an explanation in German is added. For example, when Alice is explaining the Caesar shift cypher by using the word ‘and’ as an example, the German translator also uses the English word ‘and’:

> Aber ich habe mich als Kind so viel mit Verschlüsselungstechniken beschäftigt, dass ich das Rad irgendwann nicht mehr brauchte und stattdessen mit sechsundzwanzig Varianten vertraut war, das englische Wörtchen *and* zu schreiben: BOE, CPF, DQG und und und. (2010: 105)

The German word *und* is very similar to the English word 'and'. Thomas starts with using a minus one shift, then a minus two and so on. This explanation could have easily been translated into German with a minimum amount of change and no addition of the explanation: das Wörtchen *und* zu schreiben: VOE, WPF, XQG. In Alice's explanation the letter 'a', being the first letter of the alphabet seems to be chosen precisely because it is the first letter of the alphabet and therefore makes a good starting point to encipher a message. Still, a German word starting with an 'a' such as *auf* ('on') could have been used: das Wörtchen *auf* zu schreiben: BVG, CWH, DXI.

Sometimes the selected translation strategy draws attention to the fact that the characters in the fictional world do write and speak in English, even though the translation is written in German. When cipher-message are written in English, and the translator draws attention to the different language, it becomes apparent to readers they are reading a translated work. For example, it is explicitly explained that a coded message is written in English: "Nehmen wir an, jemand schickt mir eine auf English verfasste Nachricht" (136).

There is another example of a puzzle that uses a different encoding method, which again has not been translated. The puzzle exists of a list of numbers presented to Alice:

> 263, 18; 343, 9; 363, 97; 363, 98; 325, 27; 106, 120; 300, 52; 20, 7; 71, 40; 92, 18; 151, 60; 258, 6; 71, 40; 58 38; 104, 5; 34, 143; 342, 18; 342, 19; 342, 20. (Thomas 2004: 385)

Alice does explain how to decipher this message. The book that is used to encipher this message is *Woman on the Edge of Time*. The first number represents the page number of the book and the second number represents the word on that page. The solution to this message is not given straight away. The reader might be able to solve this before Alice does. This message would cause several translation problems if the novel *Woman on the Edge of Time* was not translated into the target language. A translator would have to decide if another novel would have been appropriate to substitute this novel or to leave the puzzle untranslated. However, *Woman on the Edge of Time* has been translated into German (*Frau am Abgrund der Zeit*) and could have been consulted. Handels left the numbers untranslated and added the translation of the message after the English message is given:

> Ich lese die Nachricht noch einmal durch, füge meine eigene Interpunktion hinzu und mache mir klar, was sie bedeutet: *Geh nicht. Schlag zurück. Kämpfe gegen den feindlichen Konzern. Treffpunkt heute Abend um acht in deinem Zimme*r. (2010: 605)

The German translator might have chosen to keep the puzzles untranslated since the events take place in the United Kingdom. Therefore, it would only be logical that Alice communicates in English. However, the willing suspension of disbelief will be retained if the puzzles are translated in German. All other events are described in German, which is part of how the willing suspension of disbelief is constructed. By writing one story element in another language may compromise the reader's willing suspension of disbelief. However, the translator establishes an overall clear and coherent translation by using the chosen translation strategies consistently. Handels has used a foreignizing translation strategies consistently when the puzzles occur.

Handels chosen translation strategy seems to be less appropriate in order to recreate the spirit of the original work. The reader's experience in Thomas' original text is an active one. Thomas set out to implement interactive elements. By using a foreignizing translation strategy combined with addition and explanations, the puzzles are less 'playable', in particular for non-English readers. In addition, Handels also omitted the crossword puzzle at the end. Since the crossword is not needed in the story this choice seems valid. However, retaining it would have reinforced the interactive element in the story, which has become less apparent by not translating the other puzzles in the book.

Two excerpts from *PopCo* (Appendix B) will be translated into Dutch. The first excerpt was selected based on the translation problems the puzzle and the explanation in the prose cause. It is an excerpt from the ninth chapter, in which Alice receives the first encrypted message on a PopCo *with compliments* slip. She does not know who the sender is but is determined to decode the message. She explains how she is about to work on the solution, and by doing so explains the basic rules of code-breaking to the reader. All three rules that make up Salen and Zimmerman's three-part system (operational, constitutive and implicit) are explained in this excerpt. Several examples of ciphers are provided and explained, although the solution is not always provided by Alice.

Thomas mixes non-focalized narration with focalized narration where the reader is directly addressed, as is the convention in instructive texts. This section of the novel belongs to the domain of instructive texts. In order for the instructions to persuade the reader to get involved, a domesticating translation strategy will be used on both puzzles and their explanation. This excerpt will lay bare the translation process of translating puzzles in fiction.

The second excerpt comes from the twenty-seventh chapter, in which Alice has just decided to quit her job and leave the conference as soon as possible. She then receives the final message. This cypher is based on *Woman on the Edge of Time*. This cypher was chosen in order to prove that it can be translated without addition or explanation in the target language. The willing suspension of disbelieve will not be compromised and by using a domesticating translation strategy a clear and coherent text will be produced while simultaneously successfully recreating the intent and mood of the original work, including its active appellation to the reader's code-breaking skills.

Chapter 4: Translation

Hoofdstuk negen

Pagina 82 - 89

Vervolgens haal ik het visitekaartje van PopCo uit mijn broekzak en leg het op het bureau.

WSIKGDBKGFBWYFSAWYMRPHYGRXHZTOPYI[1]

Tijd om dit te ontcijferen. Ik negeer prangende vragen als ‘wie heeft me dit gestuurd?’ Ook negeer ik het feit dat ik zo erg aan slaap toe ben dat mijn ogen ervan beginnen te tranen en ik begin te zoeken naar patronen. Ik heb er een minuut of tien voor nodig om te bevestigen dat mijn eerste intuïtieve theorie klopt: dit is geen simpele monoalfabetische substitutieversleuteling. Dus probeer ik het met de Vigenère-methode en zie of dit iets oplevert.

Patronen. Hoe langer de tekst, hoe meer patronen je er natuurlijk in vindt. Ik maak op een kladblaadje wat aantekeningen van een aantal interessante dingen die ik hier alsnog ontdek.

Monoalfabetische versleutelingen in allerlei vormen bestaan al honderden, zo niet duizenden jaren. In zo’n versleuteling wordt iedere letter van het alfabet vervangen door

[1] In this excerpt of the translation the solution to this message is not provided. In the source text the solution is provided at the end of the chapter. The original cipher-text reads: XYCGKNCJYCJZSDSPPAGHDFTCRIVXU, which deciphers to ‘I knew you would be able to read this’. The key that was used to encipher this message is POPCO. The message is too short to find any relevant patterns. However, Alice finds one pattern, CJ and CJ that are repeated soon after each other. The translated cipher-text uses the same key. There is also a repetition of WY that occurs due to the same reasons as CJ in the original. The translated plain-text reads ‘*het is onvermijdelijk dat je dit kraakt*’ (‘it will be inevitable that you crack this’). The message in the translation is also too short for any other patterns to be recognised. The meaning of the message has slightly changed but the overall function and structure of this cipher are retained.

een andere letter van een zelfde soort versleutelalfabet. ‘A’ kan bijvoorbeeld geschreven worden als ‘P’ en ‘B’ kan geschreven worden als ‘S’. Elke letter van het alfabet wordt door steeds dezelfde versleutelletter vervangen in de code. Het wordt een ‘monoalfabet’ genoemd omdat er maar één versleutelalfabet gebruikt wordt. Ik weet nog dat dit als kind aan me werd uitgelegd en dat er werd gesuggereerd dat het een ‘makkie’ was om dit soort codes te ontcijferen. De Caesarcode, ja: dat is echt een makkie. Het enige wat je hoeft te doen is nagaan hoeveel plaatsen het alfabet is verschoven en je bent er. Maar als een versleutelalfabet compleet willekeurig is samengesteld dan wordt het wel ietsje lastiger. Ga maar na[2], als je bedenkt dat het versleutelalfabet zelf de oplossing is, dan heeft de Caesarcode vijfentwintig mogelijke oplossingen (omdat er maar vijfentwintig mogelijke manieren zijn om het alfabet te verschuiven zonder het daadwerkelijk om te gooien). Maar als het versleutelalfabet (een standaard zesentwintig-letterig Latijns alfabet[3]) op wat voor manier dan ook kan worden herschikt, dan zijn er, zoals mijn opa me ooit duidelijk maakte, 403.291.461.126.605.635.484.000.000 mogelijke oplossingen te vinden. Dit getal is de faculteit van zesentwintig (schattig genoeg door wiskundigen geschreven als 26!, waarmee ze bewijzen dat ze net als de speelgoedindustrie iets hebben met uitroeptekens).

Dit was de eerste keer dat ik van faculteiten hoorde. Mocht je het ooit nodig hebben, faculteiten worden als volgt berekend: 3! = 3 x 2 x 1 en 5! = 5 x 4 x 3 x 2 x 1 en 13! = 13 x 12 x 11 x 10 x 9 x 8 x 7 x 6 x 5 x 4 x 3 x 2 x 1, enzovoorts. Het is eigenlijk best simpel. 100!, alle cijfers van 1 tot 100 met elkaar vermenigvuldigd, levert een groter getal op dan

[2] In the source text the words ‘in fact’ were used. *Ga maar na* (‘go figure’) is more directly addressed to the reader. *In feite* (‘in fact’) which implies objectivity (in Dutch) could also have been used in the translation, however, this seems to be less logical in Dutch with the next segment *als je bedenkt*, which implies subjectivity. As Alice is explaining the rules, which is part of the persuasive feature of the puzzle, using the more direct form seems appropriate and is at the same time idiomatic.

[3] I have opted for naming the general name of the alphabet (Latin). In the source text Thomas writes ‘English alphabet’. By not using a domesticating translation strategy but to use a universalization, no attention was drawn to the fact that the reader is reading a translation.

het aantal atomen in ons universum. Nou ja, zoals mijn opa zei, niemand kan al die oplossingen nagaan. En zo is het: zelfs een moderne computer – jawel – zou er langer over doen dan het heelal bestaat om zo'n berekening uit te voeren (misschien terwijl ondertussen ook alle mogelijke opstellingen van Go-stukken worden nagegaan).

Nadat mijn opa faculteiten aan me had uitgelegd was ik klaar om de uitdaging aan te gaan. 'Doe dan maar,' zei ik. 'Maak een willekeurig dingesalfabet, schrijf een code en ik durf te wedden dat ik hem kan kraken.' Dat deed mijn opa en ik kraakte de code, want een monoalfabetische versleuteling los je niet op door de sleutel te raden.

Stel: iemand stuurt je een briefje geschreven met een monoalfabetische substitutieversleuteling waarin iets staat als: NY GCI NNEI NNE FNSYON HCA HCPXA LN TNXNSFACCU MQE UNLNE AQA HN HCT LN HCA NPXA FQNYA[4]. Dan begin je als volgt. Wat is het kortste woord? In het Nederlands bestaan alle woorden, met uitzondering van 'u', uit tenminste twee letters. Er komen in dit bericht vier tweeletterwoorden voor. Bij woorden die het meest voorkomen in het Nederlands gaat het vrijwel altijd om woorden die alleen een grammaticale functie hebben. Grote kans dat het tweeletterwoord 'de' erin staat[5]. Dan ga je op zoek naar de meest gebruikte letters. In deze code is dat de N, die zestien keer voorkomt; A die tien keer voorkomt; C die negen keer voorkomt; H die zeven keer voorkomt; E die vier keer voorkomt; F, L,Q en Y komen drie keer voor; I, P, T en U drie keer en G, S, M en O allemaal één keer. Daarbij valt op dat de meest voorkomende letter N twee

[4] The message in the source text was encrypted incorrectly. Thomas reversed some letters and the decoded message had five misspelled words, it reads: "Once upon a time there was a girl who thought rhe could sead ciphesr until the day rhe seally had to." Since the solution to this puzzle is not given in the story and readers have to solve it themselves, the mistakes seem to serve no purpose and were made accidentally. The author was corrected in the translation.

[5] In the original, readers are advised to locate letters that appear on their own in the message because there are only two single-letter words in common usage in English. In Dutch there are is one single-letter word *u* (polite form of address for 'you'). Since this word is not used in the message it was opted to use one of the most common two-letter words in Dutch according to the *PAROLE-corpus* investigation.

keer als digram[6] gebruikt wordt in het derde en vierde woord. Een digram is een opeenvolging van twee lettertekens, zoals ee, oo, ui, au, st, ng. Een combinatie van drie letters heet een trigram. Digrammen kunnen van pas komen bij het kraken van monoalfabetische versleutelingen aangezien alleen bepaalde letters verdubbeld kunnen worden[7].

Bedenk wat je allemaal weet over taal[8]. Je weet dat de E en de N de meest gebruikte letters[9] zijn in iedere 'gewone' tekst. Het meest gebruikte lidwoord is 'de'. Is er een tweeletterwoord dat 'de' zou kunnen zijn? Om een monoalfabetische versleuteling te kraken zonder de sleutel te weten, moet je een woorddetective zijn. Je moet op zoek gaan naar patronen. Je moet de letters invullen waarvan je denkt dat je ze weet en zien of er iets uitkomt. Als je dit op deze manier doet, ben je in staat om het bericht te ontcijferen.

Een ander alternatief is dat je altijd nog de frequentie van letters kunt nagaan, wat zeker van pas komt als je een bericht in geheimschrift hebt dat niet in woorden is onderverdeeld. De frequentie kun je analyseren door te noteren hoe vaak iedere letter in het geheimschrift voorkomt zodat je een overzicht hebt van de meest gebruikte letter. Vervolgens zoek je er een frequentietabel bij van de meest gebruikte letters (daar zijn er veel te vinden en mensen posten ze tegenwoordig zelfs gewoon online). Je neemt vervolgens de meest gebruikte letter in je geheimschrift en vervangt deze door de meest

[6] In the source text the word digraph is used. A digraph refers to a pair of letters pronounced as a single sound. Thomas' given explanation refers to digrams, which refers to a pair of letters often written down in repeating pairs and can be extremely useful to break ciphers. Therefore, 'diagraph' is translated into *digram* ('digram') instead of *digraaf* ('digraph').

[7] The most common pairs of digrams in Dutch are omitted, as no study results were available regarding these repeated-letter digrams. In order not to misdirect the reader omission seems the most desirable option. The extra information provides extra guidance but is not essential for the explanation of cyphers.

[8] I have omitted *de Nederlandse* ('Dutch') and just mention 'language' in general. If the language is not specified, no attention will be drawn to the fact that all is written in Dutch although the events take place in England.

[9] Information about the most common letters was required from 'Genootschap Onze Taal': https://onzetaal.nl/taaladvies/letterfrequentie-in-het-nederlands

gebruikte letter (volgens je frequentietabel). Vervolgens neem je de op een na meest gebruikte letter in het geheimschrift en vervangt die door de op een na meest gebruikte letter en zo ga je door. Het is verrassend hoe vaak dit klopt met slechts een paar kleine aanpassingen. Deze methode stelt je meestal in staat om het bericht te kunnen ontcijferen. Als de patroonherkenningsmethode gelijk is aan Sherlock Holmes' deductiemethode dan is de frequentiemethode gelijk aan zoiets als modern forensisch onderzoek.

Dit is trouwens de sleutel die je vindt als je de boodschap hebt ontcijferd:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

c i p h n r t x s o m u f e q v w z y a b d g j k l

In de eerste versie van mijn KidCracker-set zat een Alberti-decodeerwiel, een Jefferson-decodeerwiel, een Enigma-machine op batterijen en een gelamineerde Vigenère-tabel. Alberti was een vijftiende-eeuwse architect en staat bekend als de grondlegger van moderne Westerse cryptografie. Zijn decodeerwiel vormde de basis voor alle soorten polyalfabetische substituties die later kwamen, inclusief Enigma. Samen met twee jonge ingenieurs van de afdeling Mechanisch Design bij PopCo in Londen werkte ik aan het reproduceren van deze apparaten, die in productie werden gebracht nadat we allerlei primaire bronnen en objecten in de nationale bibliotheek[10] en verschillende musea hadden onderzocht. Dit resulteerde erin dat mijn codekraakset voor negen- tot twaalfjarigen werkende miniatuurmodellen bevatte van sommige van de beste codeerapparaten. Originele uitgaven van deze set worden tegenwoordig door verzamelaars gekocht voor meer dan honderd keer de oorspronkelijke verkoopprijs en bezitten dezelfde aantrekkingskracht onder volwassen cryptografiefanaten als de beroemde Super-8-camera

[10] In the source text the 'British Library' is mentioned here. In order to draw no attention to the fact that all information about cyphers is translated, it is not specified in the translation which national library was visited.

van Fisher-Price onder volwassen filmmakers. Het heeft vast ook geholpen dat mijn set in sommige landen verboden werd en opnieuw moest worden uitgebracht zonder de vele interessante extraatjes die voor alle commotie zorgden. Ik verwachtte dat ik in de problemen zou komen omdat ik speelgoed had bedacht dat verboden werd – waarschijnlijk zou dat ook gebeurd zijn als het niet in ons voordeel had gewerkt. Er was een aantal kranten dat er een kort stukje aan wijdde en de publiciteit die dat opleverde compenseerde de schade die het verbod had veroorzaakt. Ik moest hierover echter wel op gesprek bij Carmen de eerste, die me tijdens dat gesprek allerlei tips gaf over het uitzoeken van wetgeving en een heleboel anekdotes aanhaalde over geflopte nieuwe producten door toedoen van ontwerpmongolen (de lancering van de *Nova*-auto in Spanje is het meest voor de hand liggende voorbeeld; *No va*[11] betekent natuurlijk 'het gaat niet' in het Spaans).

Toen de set eenmaal was 'aangepast', zat alleen de Vigenère-tabel er nog in. De Amerikanen hadden de meeste stennis geschopt over de originele uitvoering, door zich te beroepen op een wet die ervoor bestemd was om te voorkomen dat geavanceerde versleutelingsapparaten het land binnenkwamen of verlieten. (Het is zelfs zo dat je om die reden geen volledige versies krijgt van sommige internetbrowsers buiten de VS, omdat het tegen de wet is de versleutelingssoftware te exporteren waarvan ze gebruik maken). Ik vond het grappig dat mijn Vigenère-tabel nog wel toegestaan was. Zou een negen- tot twaalfjarige ooit in staat zijn om daar een revolutie mee te ontketenen of een regering ten val te brengen? Waarschijnlijk wel. Maar het hoofdstuk over Vigenère slaan kinderen vermoedelijk over omdat het echt veel te ingewikkeld is.

[11] In the source text the word 'Nova' is repeated. *Nova* is either a name or a word in Spanish meaning the same as the English word *nova* ('star'). *No va* as two separate words does mean 'it doesn't go'. The source text was corrected in the translation.

In tegenstelling tot monoalfabetische versleutelingen is het doorgaans wel noodzakelijk om de sleutel te kraken van Vigenèrecodes, hoewel de sleutel van een Vigenèrecode meestal uit één simpel woord bestaat in plaats van een heel alfabet dat willekeurig is gerangschikt. De code zelf is echter wel veel ingewikkelder en onmogelijk op te splitsen zoals je zou doen bij een monoalfabetische code.

Monoalfabetische codes hebben betrekking op slechts één versleuteld alfabet. Ze zijn makkelijk te kraken omdat wanneer je eenmaal weet door welke letters de 'e' en de 'n' zijn vervangen de rest net zo makkelijk is als een potje galgje. Polyalfabetische substituties gebruiken echter meerdere alfabetten tegelijk. Het is moeilijk te beschrijven wat de doorbraak betekende toen Alberti suggereerde om meerdere alfabetten in één code te gebruiken. Monoalfabetische substituties zijn áltijd te kraken op basis van frequentie-analyse (zelfs als de Sherlock Holmes-methode niet werkt). Maar stel nou dat je door de hele boodschap heen de frequentie van letters door elkaar kunt husselen door meerdere codeletters te gebruiken voor dezelfde gewone letter? Dat vroeg Alberti zich af. En hij bedacht een methode die gewoonweg, nou ja, geniaal is eigenlijk. Je tekent een vierkant dat bestaat uit zesentwintig verschillende versies van het alfabet, waarbij iedere versie steeds één letter verschuift (zie de tabel). Dan kies je een kort versleutelwoord, bijvoorbeeld KAST[12]. Je schrijft als volgt het versleutelwoord herhaaldelijk boven je boodschap om die te versleutelen:

K A S T K

h a l l o

[12] The option of the Dutch translation of RAIN was not desirable in this case. First of all, because the Dutch word *regen* would be longer which would have caused a translation problem later on (see footnote 13). More importantly, a word that uses an 'A' as second letter was needed in order for the explanation about line 'A' to logical in the translation. *Kast* ('closet') is a compatible translation since it meets both requirements of being equally as long as 'rain' and also has an 'a' as second letter.

K A S T K A S T K A S T K A S T K A S T K A S T K A

e e n m e i s j e d a t e e n c o d e k r a a k t e[13]

Je gebruikt dan de letter van het versleutelwoord om te bepalen welke 'regel' van de Vigenère-tabel je gebruikt om de letter eronder te coderen. De 'h' van 'hallo' is versleuteld door regel K en wordt dus R. 'A' is versleuteld met regel A en blijft dus A (alle letters uit regel A blijven altijd versleuteld met zichzelf, wat tevens ook de reden is dat niet veel versleutelwoorden de letter A bevatten). 'L' is versleuteld met regel S en wordt D. De volgende 'l' is versleuteld met regel T en wordt dus E. Dus het eerste woord 'hallo' is te lezen als: RADEY, wat in geen enkel opzicht meer lijkt op de monoalfabetische versie van het woord 'hallo'. Het is helemaal niet te herkennen dat de digram 'll' wordt gebruikt aangezien beide gelijke letters vervangen worden door twee verschillende letters. Andersom zou het ook kunnen voorkomen dat dezelfde gecodeerde letter meerdere andere gewone letters representeert, zoals de D in de langere boodschap hierboven, die versleuteld als volgt is te lezen[14]:

OEFFOIKCODSMOEFVYDWDBASDDE

Dit ga je nooit kraken door middel van frequentie-analyse of met giswerk. Om dit te kraken, moet je weten dat KAST als sleutel is gebruikt. Dit is de enige manier om een Vigenèrecode aan te pakken. Soms kan de sleutel natuurlijk wel door simpel giswerk achterhaald worden. Na de aanslag op het World Trade Centre was er een bedrijf waarvan bijna al het personeel

[13] The translated message has a different meaning compared to the original. The original message is "the hardest of them all". The content of the translated message *een meisje dat een code kraakte* ('a girl who cracked a code') is compatible with the meaning of the previous cipher (Once upon a time there was a girl who thought she could read ciphers until the day she really had to). Altering the message was necessary in order to provide a valid explanation of how this cipher operates.

[14] The sentence "There's no clue to the 'll' diagraph any more, and 'Y' stands for two different letters" was split and extended. This was necessary as no letter appears twice in the enciphered message of *hallo*. The next sentence explains this part of the same code-letter representing multiple plain-letters.

Vigenère-tabel

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
B	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A
C	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B
D	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C
E	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D
F	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E
G	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F
H	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G
I	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H
J	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I
K	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J
L	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K
M	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L
N	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M
O	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N
P	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Q	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
R	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
S	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
T	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
U	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
V	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
W	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
X	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
Y	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Z	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y

was omgekomen. De paar mensen die waren overgebleven besloten het bedrijf draaiende te houden maar werden hierin tegengewerkt doordat alle bedrijfswachtwoorden verloren waren gegaan omdat niemand van de mensen die de wachtwoorden wist nog in leven was. De overgebleven werknemers zijn er toen voor gaan zitten om alle aspecten van het leven van hun overleden collega's na te gaan. Ze noteerden hun vakantiebestemmingen, namen van huisdieren, enzovoorts totdat ze alle wachtwoorden gekraakt hadden. Iemand die geroerd was door de bevlogenheid die het personeel van dit bedrijf toonde, heeft mij dit verhaal verteld. Zelf vond ik het een van de meest lugubere verhalen die ik ooit heb gehoord.

Aangezien het echter erg onwaarschijnlijk is dat je het sleutelwoord weet van een boodschap van iemand die niet wil dat je het leest, moet je logisch verdergaan en zoeken naar patronen in de boodschap die erop kunnen wijzen wat het sleutelwoord zou kunnen zijn. De meeste boodschappen zullen aanzienlijk ingewikkelder zijn dan welk voorbeeld dan ook. Maar in ons voorbeeld kunnen we wel beginnen met het zoeken naar patronen.

OEFFOIKCODSM**OEF**VYDWDBASDDE[15]

Dezelfde trigram lijkt herhaald te worden in de boodschap, wat twee dingen kan betekenen. Of dit is per toeval het resultaat van de versleuteling, in dat geval hebben we er niks aan, of misschien betekent dit dat de gewone tekst onder dezelfde letters van het sleutelwoord staan en daarom twee keer op dezelfde manier is gecodeerd – als dat zo is dan helpt ons dit enorm.

Na Alberti's oorspronkelijke idee duurde het een dikke driehonderd jaar voordat iemand ontdekte op deze manier Vigenèrecodes te kunnen kraken. Charles Babbage, de gestoorde en briljante uitvinder van de *Difference Engine* (de eerste mechanische rekenmachine), wijdde zijn aandacht aan het kraken nadat hij een bizarre discussie had gevoerd met iemand die beweerde dat hij voor het eerst polyalfabetische substituties had bedacht.

'Ik heb een compleet nieuwe onbreekbare code uitgevonden!'

'Nou, zo nieuw is dat niet. Het bestaat al ongeveer…'

'Ik zweer dat mijn code onbreekbaar is!'

'Dat zal best, maar jij hebt hem niet uitgevonden.'

[15] The coded message is extended in the translation but the repeated trigram occurs at the same places. Even though the letters are not the same, Alice's explanation can also be applied on the Dutch translation this way.

'Daag je me nu uit?'

'Nou ja, kom maar op, idioot.'

'Bewijs maar dat jij hem wel kunt kraken'

Dus Babbage, die een uitdaging afkomstig van zo'n hersenloos persoon niet kon weerstaan, zelfs al was die uitdaging absurd, kwam met onze oplossing op de proppen. Zo zat Babbage een beetje in elkaar. Naast de Difference Engine heeft hij ook de snelheidsmeter, de koeienvanger (het traliewerk dat aan de voorkant van treinen werd bevestigd om vee van de rails te halen) en de basis voor moderne postbedrijven uitgevonden, waardoor een brief voor dezelfde prijs naar elke plek in het land gestuurd wordt. Hij merkte op dat wanneer je patronen kunt ontdekken in codes, zoals in de code hierboven met de herhaling van het trigram OEF, je dan op de volgende manier verder moet: ervan uitgaande dat je een langer stuk geheimtekst hebt, zijn er altijd herhaalde clusters van letters te vinden. Vervolgens tel je het aantal letters van het begin van het eerste cluster tot aan het begin van het volgende. In ons bovenstaande voorbeeld tel je twaalf letters vanaf de eerste O tot de O van het volgende cluster[16]. Hieruit kun je opmaken[17] dat het sleutelwoord (dat herhaaldelijk boven de gewone tekst is geschreven gedurende het versleutelproces) bestaat uit een aantal letters dat een factor van twaalf heeft. Met andere woorden 12, 6, 4, 3, 2 of 1 aangezien je deze door twaalf kunt delen. Dat is ook logisch, aangezien we ervan uitgaan dat dezelfde letters na twaalf karakters weer gebruikt worden in zowel het sleutelwoord als de gewone tekst, hetgeen resulteert in de

[16] *Het volgende cluster* ('to the next cluster') had to be added even though it is not present in the source text. In the source text only two K's occur in the cipher-text, both in the trigram. Since there are more O's present in the translation this had to be clarified.

[17] I considered to translate "This tells you" into *Hieruit kan worden opgemaakt*. However, this is a persuasive element where the reader is directly addressed on purpose. Therefore, I choose to maintain the direct form of address in Dutch.

herhaling in de geheimtekst. Een tweeletter-sleutelwoord zou zes keer herhaald zijn voordat het weer opnieuw begon; een twaalfletter-sleutelwoord maar één keer. Bij een langer stuk tekst zou het mogelijk zijn om de verschillende factoren steeds na te lopen tot de uiteindelijke lengte van het woord duidelijk is.

Wat er vervolgens wordt gedaan is behoorlijk ingewikkeld. Als je erachter was gekomen dat het sleutelwoord bestaat uit vier letters dan markeerde je iedere letter van de geheime boodschap met een 1, 2, 3 of 4 afhankelijk van of het met de eerste, tweede, derde of vierde letter van het sleutelwoord is gecodeerd. Dan voer je een frequentie-analyse uit op elk letterpaar; dus voor de letters die met een 1 zijn gemarkeerd maak je een tabel van dat aantal die je vervolgens vergelijkt met een standaardtabel. Dit doe je voor alle letterparen totdat je elke letter van het sleutelwoord hebt gevonden en je de boodschap kunt ontcijferen.

Maar ik pak het als volgt aan.

Hoofdstuk zevenentwintig

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Ik loop bijna voorbij de deur. Het is piepklein. Binnen staan er op de houten vloer een paar tafeltjes, wat sierplanten en helemaal in de rechterhoek een piano. Er is bijna niemand dus ga ik aan een tafeltje achterin zitten. Wat zal ik eens bestellen? Ik heb de laatste paar dagen alleen maar veganistisch gegeten en ik ben geneigd om door te gaan met dit experiment. Zou het gaan vervelen? Zal ik wegkwijnen? De tijd zal het leren. Ik bestel een kopje zwarte koffie en meergranentoast met marmelade maar zonder boter. Dan haal ik het pakketje uit mijn tas.

Het is verpakt in een witte bubbeltjesenveloppe, beplakt met doorzichtig tape. Mijn naam staat er in blauwe hoofdletters op geschreven. Degene die mij dit gestuurd heeft is – misschien wel puur toevallig – zo slim geweest om over mijn naam heen te tapen. Mijn naam verdwijnt binnen een seconde wanneer ik de tape eraf trek. Zo weet ik tenminste zeker dat er niet mee is gesjoemeld nadat het verpakt werd. Wanneer ik de enveloppe openmaak, haal ik de inhoud eruit. Het is een boek dat ik altijd en overal herken. Ik laat het met trillende handen op tafel vallen. Het is het boek *Vrouw op het scherp van de tijd*[18] uit 1986. Hetzelfde boek dat ik thuis heb omdat mijn moeder het mij jaren geleden heeft nagelaten. Natuurlijk is het niet mijn boek: er staat niks in geschreven. Er zit wel een netjes in tweeën gevouwen papiertje in.

Er komt een ober naar de tafel gelopen op zoek naar een plekje om mijn koffie en toast neer te kunnen zetten. Ik haal mijn tas en boek weg en mompel een soort bedankje. Mijn handen trillen nog steeds. Zal ik het erop wagen een sigaretje te roken? Misschien een halve. Misschien over een minuutje.

'Mag ik hier roken?' vraag ik aan de ober terwijl hij wegloopt.

'Ja, tuurlijk. Ik haal een asbak voor je.'

Ik heb geen trek meer, maar eet de toast toch snel op zodat deze niet verspild wordt. De koffie is sterk en prikt in mijn keel. Ik neem nog drie voorzichtige slokken voordat ik mijn handen aan het servetje afveeg en het boek erbij pak. Een kleine handgemaakte asbak

[18] There is only one Dutch edition of *Woman on the Edge of Time*, published in 1986. The edition Alice uses in the source text is the 1979 Women's Press edition. Since publisher, year of publication and edition are important to be able to decipher the message it had to be mentioned explicitly. However, the Dutch translation is based on the original publication from 1976. The temporal difference between the two copies does not affect the structure of the fictional world. Alice inherits her mother's copy when she is eleven. In which year this was in is never specified. The willing suspension of disbelief can still be upheld despite the seven-year time difference. Naming the Dutch title suffices in order to establish what book is used, since there is only one edition of this novel in Dutch. In order to maintain the willing suspension of disbelief no additional attention was drawn to the fact that Alice is referring to a translation (and probably not familiar with the Dutch language).

verschijnt op tafel. Ik rol een dun sigaretje, steek het aan en kuch voorzichtig. Het voelt oké – nou ja, behalve dan dat mijn hoofd zowat ontploft door de plotselinge inname van chemicaliën en nicotine. De ruimte wordt wazig en dan weer scherp. Het boek. Ik open het en haal het papiertje eruit.

Hier is dan eindelijk wat ik al had verwacht. Een lijst met nummers:

276, 54; 344, 7; 320, 250; 320, 131[19]; 234,152; 111, 12; 27, 8; 277, 156; 15, 202; 345,53; 60, 10; 155, 211; 193, 54; 122, 132; 262, 219; 23, 20; 6, 20; 180, 291; 96,3; 6, 65; 136, 24; 318,6; 317, 39.

Ik pak mijn kladblok en potlood erbij en sla pagina 276 van het boek open. Het 54ste woord is *ga*. Ga waarheen? [20] Ik blader verder naar pagina 344 wanneer de kleine deur met veel lawaai wordt geopend en een aantal PopCo-lui naar binnen stapt: Grace, Kieran, Frank, James en Violet. Shit. Ik stop snel, voordat ze me zien, het boek en het papiertje terug in mijn tas. Dan begin ik, net alsof ik dat al heel de tijd aan het doen ben, nonchalant in mijn kladblok te krabbelen.

'Wat een leuk tentje, dit,' zegt Kieran met zijn luide stem.

'O, kijk. Daar zit dinges.'

'Alice,' zegt Violet.

Het is altijd fijn om in je eentje in een koffiebar te zitten totdat er een groepje mensen binnenkomt die je kent. Nu ze mijn naam genoemd hebben, moet ik wel opkijken.

[19] The numbers of the book pages have been altered accordingly in the translation. However, they refer to different pages throughout the whole novel, as they do in the source text. In the source text there are two similar numbers: '363, 97' and '363, 98'. I have copied this as far as possible in the translation: the third and fourth word are also found on the same page although they do not occur next to each other.

[20] In the source text the first word consists of a contraction between 'do' and 'not'. This type of contraction does not occur in Dutch. The verb *ga* ('go') was chosen because it refers to Alice's decision to quit her job and leave the conference and also because the next sentences follow logically out of this sentence. Alternatively, the word *niet* ('not') could have been used. However, the rest of the message would not have been idiomatic without extending the message.

‘Hé,’ zeg ik.

‘Hoe gaat het ermee?’ zegt Kieran. ‘Ben jij net zo gecharmeerd van dit middeleeuwse stadje als wij?’

‘Ja het is leuk,’ zeg ik.

‘We zouden je graag gezelschap houden, maar…’

‘Geeft niet. Ik stond net op het punt om te vertrekken,’ zeg ik.

Ik sla de rest van mijn koffie achterover, druk de sigaret uit, betaal aan de bar en ga snel weg. Waar kan ik heen om dit bericht ongestoord te ontcijferen?

Pagina 387 – 388

Ga. Dat is het eerste woord. Oké. Ik blader naar pagina 344. Het zevende woord op de pagina is *niet*. *Ga niet*… Jezus. Van wie komt dit? De volgende twee cijfers lijken op elkaar: 320, 250 en 320, 131. Twee woorden. Ik blader naar pagina 320 en tel de woorden. Het 250ste woord is ‘vecht’ en het 131ste is ‘terug’. *Vecht terug*.

Ik doe er een minuut of tien over om de woorden te tellen voordat ik het volgende gevonden heb: *Ga niet vecht terug strijd tegen de corporatieve*[21] *vijand wacht van avond om acht uur op me in je kamer het is oorlog*. Jezus. Het duurt ongeveer een minuut voordat de betekenis hiervan door begint te dringen. Ik denk opeens aan Francis Stevenson en de mysterieuze tekst waarmee hij zijn schatkaart heeft versleuteld. Ik herinner me dat mijn opa aan me uitlegde dat je altijd moet bedenken welk soort boek de juiste woorden bevat om een specifieke boodschap te kunnen creëren. Ik kijk naar de woorden in deze boodschap.

[21] The words *comparatieve* (‘comparative’) or *corporatieve* (‘corporate’) do not occur many times in the novel. It is actually misspelled and used as *comperatieve fabrieksboerderijen*. As this seems to be an accidental mistake it was corrected in this translation.

Vecht, vijand, corporatieve, oorlog, strijd. Geen een van deze woorden zou te vinden zijn in het paardenboek dat ik heb gestuurd. Ik moet lachen om de splitsing van het woord 'vanavond', dat in het bericht als twee losse woorden is geschreven. Je zou het misschien niet verwachten maar soms is het behoorlijk lastig om een simpel woordje als *vanavond* in een lange tekst te vinden. *Vrouw op het scherp van de tijd* is geschreven in de verleden tijd, wat betekent dat je een woord dat in de tegenwoordige tijd wordt gebruikt, zoals 'vanavond', alleen in de dialoog kunt terugvinden. Het ligt er vaak ook aan of de afzender, zoals deze, een samentrekking (IQ-test) als één of als twee woorden telt. Het 221ste woord op pagina 155 was of avond of avond-medicatie. *Wacht op me van avond-medicatie* slaat nergens op dus medicatie laat ik weg[22].

Maar wat doet dat er nu ook allemaal toe. Ik lees de boodschap nog een keer en voeg dit keer interpunctie toe. *Ga niet. Vecht terug. Strijd tegen de corporatieve vijand. Wacht vanavond om acht uur op me in je kamer. Het is oorlog.* Van wie komt dit? Wat gebeurt er allemaal? En dan opeens begrijp ik het. Ik dacht dat er geen vijand bestond. Vervolgens besefte ik dat ik dat zelf was. Ik besloot om me terug te trekken. En nu – hoe is het mogelijk? – ga ik erachter komen dat er toch een andere kant bestaat? Dat moet ook wel geloof ik, als er ook een vijand is. In mijn hoofd ga ik de gebeurtenissen van afgelopen weken weer na, net als een wachtwoord-onthutselsysteem dat iedere letter in ieder hokje nagaat om te zien wat past. Ik kan bijna het geklik horen van gezichten, toevalligheden en

[22] The explanation of hyphenated construction in coded languages is given sooner in the source text (the sentence before Alice solves the puzzle). The second word in the original is a hyphenated construction. In order to be able to explain this (implicit) rule a hyphenated construction had to be found in the translation. The explanation of hyphenated constructions is provided further along in the text, but it is successfully retained. Consequently, the timing of providing this information has shifted. If the information would be given at the same time as the original, this would mean that Alice was nearly done solving this puzzle. Alice needs another ten minutes to solve the rest of the message. This would also have resulted in Alice already giving the solution to the reader. The reading experience would have been different compared to the original. By replacing the information about hyphenated constructions, the same information is provided to the target reader without compromising on the suspense or reading experience.

gebeurtenissen die op hun plaats vallen. En dan denk ik plotseling dat ik weet wie er vanavond naar mijn kamer komt. Het is eigenlijk net een potje Cluedo.

Discussion

The purpose of this study was to investigate what translation problems a translator faces when a work of fiction featuring a puzzle is to be translated, and how these problems can be solved. Consultation of theories on game and puzzle design and literary theory formed the theoretical background. It became clear that the function of puzzles in fiction is to change the reader's role and reading experience compared to conventional prose. In addition to changing the reading experience by adding a puzzle as an interactive element, puzzles in fiction can serve more functions. The function a puzzle in fiction serves depends on if the puzzles either occur local in the text or throughout the text. Three main functions puzzles in fiction serve were established in this study:

1) *Intending interactivity*
2) *Reinforcement of a story element, local use of puzzles*
3) *Plot development, structural use of puzzles*

More quantitate research on fictions that use puzzles will help to understand what specific genres they are used, if there are specific types of puzzles used in specific genres, and to what effect. Furthermore, quantitate studies will help to provide an overview of all functions puzzles in fiction can serve.

Once the functions of puzzles in fiction were established it became clear that language differences can constrain the translator's flexibility when translating a puzzle in a work of fiction. The translator has to play by the puzzle's rules yet at the same time find possible ways to solve the translation problems within the possibilities of the target language. Translating a puzzle is translating expertise. This skill of puzzle expertise is an

addition to the other required skills from a translator, such as language skills and cultural knowledge.

Based on the findings in the theoretical background, a methodology was designed for analysing the puzzle and determining the function the puzzle serves. Subsequently, three novels featuring puzzles that served different functions were analysed and compared to the Dutch translations in order to decide what translation strategies can be used and deciding on the most desirable approach. There are three main categories of translation strategies that are capable of solving different translation problem such as the translation of puzzles:

1) Puzzles are retained in the source language
2) Puzzles are retained and translated in the target language
3) Puzzle are omitted altogether

It was found that the second option, using a domesticating translation strategy, seems the most eligible for solving translation problems caused by puzzles. By using a domesticating translation strategy for the translation of excerpts of *PopCo* into Dutch, the intention of constructing a similar reading experience as that of the original, yet at the same time to produce a precise and coherent product, was achieved. It requires understanding of puzzle designs and puzzle functions next to language skills and an understanding how stylistics work in general. This may mean some shifts have to be made in the prose to produce a precise and coherent work of fiction. There were no sentences that were omitted in the Dutch translation. However, in order for the chronology or the explanation to be logical, some sentences have been transposed.

A foreignizing translation strategy might be considered only on condition that the solution to a puzzle is provided in the story. In addition, an explanation or translation of the solution itself can be provided. The intention of constructing a similar reading experience as

that of the original will never be achieved if the solution is not provided and the puzzles are retained in an untranslated form or omitted. However, more future translation criticism regarding translations of puzzles may help to gain insight in which specific translation strategies have certain effects and to establish which is the most desirable.

There was no prior systematic method laid out to assist translators in deciding their approach for translating a puzzle in fiction. The proposed methodology in this study provides guidance for future translators who are faced with translating works of fiction that features puzzles and in order to produce adequate translations. It is a first step in understanding and solving translation problems caused by puzzles. If a translator might come across difficulties during this puzzling process of translating, (s)he will be able to break its code.

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Appendix A: List of interests

Thomas, Scarlett. *Monkeys with Typewriters*. Edinburgh: Canongate Books, 2012, pp. 192-193.

try to escape' and tried to do something new with it (my 20-something characters, all of whom are very similar, only try half-heartedly to escape, preferring to sit around talking about sex, drugs and the meaning of life). With *Going Out* I took the well-known narrative of *The Wizard of Oz* and used it as the basis for a quest through Britain's flooded B-roads as Luke, who has been allergic to the sun for his whole life, goes in search of a cure. I have always been lucky enough to instinctively understand structure (or at least to realise I do) and I managed to have some success by using a combination of this, my love of the quirky, and much well-fictionalised autobiographical material.[166]

Then the autobiographical material ran out.

Well, OK, it never really runs out. And, of course, you're always gaining more. But I'd written quite a lot about being young and anxious, and the obvious stuff was gone. I needed something else to write about, or at least a new way of writing about being young and anxious.[167] I had a strong sense that for my next novel I wanted to write something big and sprawling and complicated. I wanted to try something really ambitious, something more important, deep and fascinating than I'd written before. And, from somewhere, I had a hunch about how I might do this: I got a big notebook and a pen and sat down and wrote a list of everything I was interested in at that moment, big and small. Then I set myself a challenge: I was to make a meaningful novel out of all those things – *all* of them, mind – and in so doing, work out how they were connected. This is what I wrote:

- Code-breaking
- Marketing
- Crosswords
- A toy company
- Mathematics
- Pirates
- Cellular automata
- Having ideas
- Boats and sailing
- Animal rights
- Veganism
- The Voynich Manuscript
- Cool grandparents
- Anti-capitalism
- Interactive elements (maybe a crossword in the book?)
- World War Two
- Being a teenage girl
- Cricket

This list represents my main interests in 2002, when I began writing the novel. The reason I put 'a toy company' on my list was because I had read somewhere that corporations like Mattel and Hasbro were having real trouble cracking the teenage-girl market. At the time, teenage girls apparently did not buy toys. Boys bought videogames, balls, skateboards and so on, but girls just bought make-up and clothes. I was intrigued by this. And I love a challenge, so I thought, *What would I sell to teenage girls?* What I came up with was an identity necklace that tells people who you are: sort of Facebook on a string (before Facebook). One of the great

Appendix B: Source text

Thomas, Scarlett. *PopCo*. 2004. London: Harper Perennial, 2009.

Now it looks like I'm part of a secret again and I'm not sure how I feel about it.

After everything is signed and handed back, Mac starts wrapping things up.

'Please be as creative as you can, people,' he says. 'The old ideas can go out of the window because they just don't work. We want a fresh approach to this problem. There will be no research, as such, just pure design and ideation. And, remember – if you think an idea is just too crazy, you may well be on the right track. Thanks.' He looks down and then up again. 'You're free to go. Don't forget the PopCo disco over at the Sports Hall. Oh – Esther, could you stay back, please – and you, Hiro.' Esther doesn't give us the funny look we expect but instead just says something like *I'll see you later*, as we get up to leave. Both Mac and Georges seem to know Esther by her first name. I can't help wondering exactly what her job is.

As soon as Dan and I are outside we are both like balloons popping.

'What the fuck?' Dan says.

'We've been chosen,' I say, kind of ironically but with a sprinkle of genuine excitement. And then we look at each other in a thrilling-secret way, our eyes reminding us that we just signed forms to promise we wouldn't talk about this in public.

'Disco?' says Dan.

'I suppose so.' I feel dazed. 'But I do want to go to bed early-ish.'

'So what exactly *was* all that about, then?' he asks me in a low voice, as we walk down the path with our torches. 'Mac's *Weird Ideas that Work: 11½ Ways to Promote, Manage and Sustain Innovation*. The 'Weird Ideas' in the book include things like 'Hire Slow Learners (of the Organizational Code)', 'Find Some Happy People and Get Them to Fight' and 'Think of Some Ridiculous or Impractical Things to Do, Then Plan to Do Them'. Innovation seems to mean that corporations are pretty much up for anything now, however crazy. Innovation is everybody's best friend this century: share-holders love it, young bum-fluff managers adore it and even normal staff members quite like dressing up as rabbits for the day, pretending to be blind or being hired despite having no experience at all. The vacuum cleaner company Dyson apparently only hires new graduates. The Sony Playstation was, legend has it, invented by people entirely new to the world of videogames. I have a suspicion that my own employment at PopCo came about as a result of a Weird Idea. *Hire someone who has a strange skill but no experience in the toy industry at all.*

I shrug. 'Don't ask me. I am genuinely baffled.'

'Does this mean that we're special, now?' Dan asks.

'I'm not sure. Perhaps.'

Chapter Nine

After spending the minimum time possible at the disco (half an hour), I make some excuses and retire to the dorm, hoping that no one else will return for a while. I tell myself that I am not scared, walking the gravel track up behind the main building. I tell myself that the night is beautiful, with its bats and silence and tiny waxing moon, and that the snuffling in the hedge outside the barn is probably a badger.

The old wooden stairs creak as I walk up them. Again, I make sure that I am not scared by concentrating on their music. It's all minor chords here: no distinct notes at all. Perhaps minor chords played on wooden stairs aren't the most soothing thing in the world because I jump like I've been injected with adrenaline when I open the door to the dorm and find a scruffy young guy standing by one of the other beds, holding something white in his hand.

'Shit!' I say, automatically.

He jumps too. 'Fuck!'

'Sorry,' I say. 'You gave me a shock.'

'Yeah, you gave me one too,' he says back.

'What are you? . . . I mean . . .' I say. I want to directly ask him what he's doing here but the words don't seem to come out. Surely he isn't going to be sleeping here? I'd assumed that the dorms were single sex.

'Yeah, sorry,' he says. 'I came to deliver this, but I don't know which bed is whose.' The thing in his now shaking hands is an

envelope which he holds up to show me. It has my name on it handwritten in blue ink.

'That's me,' I say, pointing at the name on the front.

'Oh – great,' he says, and, after hurriedly giving me the envelope, he leaves.

'Thanks,' I say. But he has gone.

I immediately open the envelope. The message is typed. *Dear Alice Butler, Please move to Study/Bedroom number 23 in the Main Building as soon as possible. There has been a mistake in the allocation of rooms. Sorry for any inconvenience. If you need any assistance with any matters at all, including those of a personal nature, please get in touch with Helen Forrest on extension 934.* The letter isn't signed by anyone. I don't understand the extension number. There are no phones here that I've seen so far, let alone ones on a PopCo network. Maybe there's one in my new room, wherever that actually is.

My tobacco pouch is on the bed, where I left it. I reach for it and roll myself a small cigarette which I smoke out of the window, watching a large moth bump against the outside wall-light. Well, it looks like I'm on the move again. Once I have finished my cigarette, and my brain feels more low-frequency and normal, I start re-packing my things.

In the dark, the Main Building feels like a place you'd get to after trekking through a bandit-ridden forest on an RPG. Approaching it from behind (rather than through the main entrance, or the Great Hall entrance), it seems like a drawing from Dan's notebook, hazy with orange wall-lights and moth-shadows. There should definitely be flute and fiddle music here, I think, and the drunken clink of goblets held by goblins and elves. It is, however, silent. After walking through a stone arch, I can see a large rectangle of well-tended grass directly in front of me, to the left and the right of which are two residential wings, each containing what seem to be several little rooms. A few are illuminated, although I can see no people. Just as I am prepared to get completely lost, I see a small sign which says Study/Bedrooms 26–51, and has an arrow pointing around to my left. I turn my head to the right and find a similar sign pointing to rooms 1–25. This is where I need to be.

I walk on stone through a covered passage, with the grass on

my left, as I count off the rooms on my right. Would people once have had sword-fights on this grass? It's easy to imagine, although I can't visualise corpses or blood, just people facing one another at dawn. Anyway, up one flight of stone stairs, through a small corridor with soft carpet and art on the walls, and then back on myself down another slim corridor and I am there. *Room 23*. There is an envelope on the door with my name on it. It contains the key, with which I unlock the door and go inside. Oh my God. This is more like it. The room has a polished, slightly uneven oak floor, a sloping, oak-beamed ceiling, and is furnished almost entirely with antiques: an old writing bureau with a little key (which immediately makes me think, *Great, I can lock away my things*, until I remember how easy it is to pick those things), a four-poster double bed, a little oak bookcase with a glass door on the front, and a comfortable-looking armchair. The room also has an en-suite bathroom containing a heavy-looking white enamel bathtub and a small sink and toilet. I feel a bit grubby so I immediately wash my hands and then dry them on a small white cotton towel. There is a little wooden mirrored cabinet above the sink, which I open. I expect it to be empty but find it instead full of expensive cosmetic and bath products, many in mauve glass bottles: seaweed and arnica bath soak; rosemary shampoo; seaweed shampoo, orange flower water, and quite a few other things. There are also delicate bars of French soap, two natural sponges, a new wooden hairbrush, nail-clippers, and a huge packet of condoms. For some reason this last find makes me blush and I leave the bathroom.

Back in the bedroom, I notice that the bookshelves actually contain books. There are many ideation and marketing titles (of course), a large dictionary, a bible and rather a lot of fiction that looks like it would appeal to teenage girls. So I am here because of Mac's Weird Idea. But why wasn't I here in this room in the first place? And why am I even part of Mac's crazy project? I still have no idea at all. But seeing this room answers Dan's question, anyway. Yes: for whatever reason, being singled out for this means we are special.

What I want to do right now is take a long bath, and then roll around luxuriating on the four-poster bed. What I actually do is take the dictionary out of the bookcase and walk over to the writing bureau. I unlock it with the little brass-coloured key and find – of course – that it is packed with expensive stationary. After packing

away the complimentary stuff in one of the drawers, I take my notebook and pen out of my bag, place them on the desk, and sit down. The notebook is the type I always use – narrow-ruled in faded-looking pale blue – and the pen is my favourite of the many small fountain pens I own. I can't really write with anything else. There is a little lamp which I switch on. I quickly write half of a lame-ish To Do list (*1. Organise cat-sitter*), ready to stick over the top of what I am doing if anyone comes along. Then I take out the PopCo *With Compliments* slip from my pocket and lay it on the desk.

XYCGKNCJYCJZSDSPPAGHDFTCRIVXU

Time to make sense of this. Ignoring persistent thoughts like *Who sent me this?* And also the fact that I want to sleep so badly my eyes are watering, I start trying to pick out patterns. It takes me about ten minutes to pretty much confirm my original, intuitive theory that this isn't a simple mono-alphabetic substitution. So I am going to go down the Vigenère route and see what happens.

Patterns. You'd see more patterns in a longer piece of text, that's for sure. Still, I can see a couple of interesting factors here, and I start making some initial notes in my notebook.

Mono-alphabetic ciphers have been in existence, in various forms, for hundreds, if not thousands, of years. In these ciphers, each letter from the plaintext alphabet is replaced with another letter from a corresponding cipher alphabet. 'A' might be written as P, and 'b' might be written as S, for example. Each letter in the alphabet will have a corresponding letter which will always stand for it in the cipher. It is called 'mono'-alphabetic because there is only one cipher alphabet. I remember having this explained to me when I was a child and suggesting that it would be 'easy-peasy' to crack any of these sorts of ciphers. The Caesar shift, yes: that is easy-peasy. All you do is work out how many places the alphabet has been 'shifted' and you've done it. But if the cipher alphabet is sufficiently randomised then it does get a bit trickier. In fact, if you think of the cipher alphabet as a key, then the Caesar shift cipher has twenty-five possible keys (as there are basically only twenty-five ways of shifting the alphabet without actually rearranging it). However, if the cipher

alphabet (a basic English twenty-six-letter alphabet) can be rearranged in any way, there would, as my grandfather once pointed out to me, be 403,291,461,126,605,635,584,000,000 potential keys to find, this figure being the factorial value of twenty-six (rather cutely written down by mathematicians as 26! and proving that they also have a thing for exclamation marks, just like the toy industry).

This was the first time I discovered factorials. If you ever need to know, factorials are calculated the following way: $3! = 3 \times 2 \times 1$ and $5! = 5 \times 4 \times 3 \times 2 \times 1$ and $13! = 13 \times 12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$, and so on. It's quite neat, actually. 100!, where all the numbers from 1 to 100 are multiplied together, gives a result bigger than the amount of atoms in the known universe. Anyway, as my grandfather explained, no one could check all those keys. It's true: even a contemporary computer would take – yes – longer than the history of the known universe to perform a calculation like that (perhaps while figuring out all the possible configurations of Go pieces.)

Even after my grandfather explained factorials to me, I was ready to take up the challenge. 'Go on, then,' I said. 'Create a random thingy alphabet, write a cipher in it and bet you I'll crack it.' He did, and I did, because the way you solve mono-alphabetic ciphers is never by trying to guess the key.

Say someone sends you a note written with a mono-alphabetic substitution cipher, and it says something like: QEPN BVQE C ASFN AXNYN GCZ C TSYU GXQ AXQBTXA ZXN PQBUH YNCH PSVXNYZ BEASU AXN HCK ZXN YNCUUK XCH AQ. You start in the following way. Is there a letter on its own? Yes. There's a C, twice. Well, there are only two single-letter words in common usage in English: 'I' and 'a'. So it's going to be one of those. Then you look for the most common letters. In this cipher they are: N, which appears 9 times; X, which also appears 9 times; C, which appears 7 times; A, which appears 7 times; Q, which appears 5 times; Y, which appears 5 times; and U, which also appears 5 times, including its appearance in a repeated-letter digraph in the third from last word. A digraph is a combination of two letters. A trigraph is a combination of three letters. Digraphs can be useful when you are cracking mono-alphabetic ciphers, and only certain letters are commonly found in repeating pairs, the most common being 'ss', 'ee', 'tt', 'ff', 'll', 'mm' and 'oo'.

Think about what you already know about the English language. You know that E and T are the most common letters in all 'normal' texts. The most common letters in the ciphertext are N and X. Is one of these going to be E or T? The most common word in English is 'the'. Are there any three-letter words in the text that look like they might be 'the'? In order to crack a mono-alphabetic cipher without guessing the key, you have to be a word-detective. You have to look for the patterns. You have to start trying to put in letters you think you know and see if anything emerges. If you do this, you will be able to unscramble the message.

Alternatively, you could always use frequency analysis, which is particularly good when you have a ciphertext that is not conveniently broken into words. Frequency analysis involves noting down the frequencies of *all* letters in the ciphertext so you have a list of the first most popular letter, the second and so on right down to the least popular letter. Then you get a frequency table (there are lots out there and people even post them on the Internet now) of the frequencies of letters in common English usage. You take the most popular letter from your ciphertext and replace it with the most popular letter in English (according to your frequency table). Then you take the second most popular letter and replace that with the second most popular letter and so on. It is surprising how often this works with only very minor adjustments. This method will certainly usually give you enough to see what the message is yourself. If the pattern-recognition method is like a Sherlock Holmes style of detection, then this frequency method is more like a twenty-first-century forensic skill.

This is the key you will get if you decipher the message:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
c	i	p	h	n	r	t	x	s	o	m	u	f	e	q	v	w	z	y	a	b	d	g	j	k	l

The first incarnation of my KidCracker pack came with an Alberti code-wheel, a Jefferson's Wheel, a battery-operated mini-Enigma machine and a laminated Vigenère square. Alberti was a fifteenth-century architect, and is known as the true grandfather of contemporary Western cryptology. His code-wheel formed the basis for all forms of poly-alphabetic ciphers that came later, including Enigma. I worked with two young engineers from the Mechanical Design team at PopCo

London to recreate these devices, which we did after researching many primary texts and objects at the British Library and various museums. As a result of this, my Age 9 to 12 code-breaking kit ended up containing miniature working models of some of the greatest cryptological devices ever invented. Originals of this kit now sell to collectors for almost a hundred times their initial selling price because of this, and have the same kind of appeal to adult cryptology enthusiasts as the famous Fischer Price Super 8 camera has for grown-up cinematographers. It probably also helps that my kit ended up being banned in various countries and had to be re-launched without the many interesting extras that were causing all the fuss. I thought I would be in all sorts of trouble for creating a toy that ended up being banned – and maybe I would have been if it hadn't worked to our advantage. As it was, a couple of newspapers ran short pieces on it and the publicity just about undid the damage the ban had caused. I was, however, given a talking-to by Carmen the first, during which I was given tips on legal research and much anecdotal evidence of product launches gone wrong as a result of fuckwitted creatives (the launch of the *Nova* car in Spain being the most obvious example; *Nova* meaning, of course, 'it doesn't go' in Spanish).

By the time the kit had been 'adjusted', all it contained was the Vigenère square. The Americans had made the most fuss over the original kit, saying that it contravened some law to do with preventing sophisticated encryption devices entering or leaving the country. (In fact, this is also why you can't get full versions of some Internet browsers outside of the States, because it is illegal to export the encryption software that goes with them.) I thought it was amusing that my Vigenère square was still allowed through, however. Would a 9- to 12-year-old ever be able to actually use it to start a revolution or overthrow a government? Possibly. But the chapter on Vigenère is probably the one that all the kids actually skipped, because it really is far too complicated.

Vigenère ciphers, unlike mono-alphabetic ciphers, do usually require you to crack the key, although the 'key' for a Vigenère cipher is usually a simple word, rather than a whole, randomised alphabet. The cipher itself, however, is much more complicated and impossible to break down in the way you would approach a mono-alphabetic cipher.

Mono-alphabetic ciphers involve only one cipher alphabet. They are easy to crack because, once you know what 'e' and 't' have been replaced with, the rest is just like completing an easy game of hangman. Poly-alphabetic ciphers, however, use several alphabets, at the same time. It's hard to describe what a breakthrough it was when Alberti suggested as a possibility the use of several alphabets in one encipherment. Mono-alphabetic ciphers are *always* crackable because of frequency analysis (even if the Sherlock Holmes method fails). But what if you could scramble the frequencies of letters by making different ciphertext letters stand for different plaintext letters throughout the message? This is what Alberti wondered. And he came up with a method that is, well, it's genius really. You draw up a square made of twenty-six different versions of the alphabet, each one shifting by one letter each time (see table). Then you choose a short keyword, say RAIN. You write the keyword over and over again on the top of the plaintext to be enciphered like this:

R A I N R
h e l l o

R A I N R A I N R A I N R A I N R A I
t h e h a r d e s t o f t h e m a l l

You then use the letter of the keyword to determine which 'line' of the Vigenère square you will use to encipher the letter below it. The 'h' in 'hello' enciphered using line R will be Y. 'E' enciphered using line A will be E (anything on line A will always be enciphered as itself, which is why many keywords don't have an A in them). 'L' enciphered on line I will be T. The next 'l', however, will be enciphered on line N, making it Y. So the first word, 'hello', will now read: YETYF, which does not look like a mono-alphabetic version of 'hello' at all. There's no clue to the 'll' digraph any more, and 'Y' stands for two different letters.

The longer message from above is encrypted like this:
KHMURRLRJTWSKHMZRLT

You are never going to crack this with frequency analysis or guesswork. To crack this, you need to know that RAIN was used as the key. This is the only way into a Vigenère cipher. Sometimes

Vigenère square

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
B	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A
C	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B
D	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C
E	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D
F	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E
G	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F
H	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G
I	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H
J	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I
K	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J
L	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K
M	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L
N	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M
O	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N
P	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Q	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
R	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
S	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
T	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
U	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
V	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
W	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
X	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
Y	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Z	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y

keys can be arrived at by simple guesswork, of course. After the World Trade Centre attacks, one firm lost almost all its staff. The remaining few decided to try to keep the company going but were hindered by the fact that all the company passwords had been lost because everyone who knew them was now dead. The remaining employees then sat down and went through every aspect of their dead colleagues' lives, noting down locations of holidays, pet names and so on until they actually cracked all the passwords. I was told this story by someone at work who'd been particularly touched by the company spirit shown by these people. I just thought it was one of the creepiest things I'd ever heard.

However, considering it is unlikely that you know the key word for a message someone does not want you to read, you have to proceed in a logical fashion and look for patterns in the message that will give you a clue to what the keyword might have been. Most messages would be vastly more complicated than any example. However, in our example, we can start to find patterns.

KHMURRLRJTWSKHMZRLT

The same trigraph, it seems, has been repeated in the message, implying one of two things. Either this is simply a random result of the encipherment, in which case it can't help us, or perhaps it means that the same plaintext word has appeared under the same letters of the keyword and has been enciphered in the same way twice – in which case it will help us immeasurably.

It took a good 300 years after Alberti's initial ideas for someone to work out how to crack Vigenère ciphers in this way. Charles Babbage, the crazy and brilliant inventor of the Difference Engine (the first computing machine), turned his attention to it after a bizarre argument with someone who thought he had invented poly-alphabetic ciphers for the first time.

'*I have invented a new, unbreakable code!*'

'*Well, actually, it's not that new. It's been around for . . .*'

'*I tell you, my code is unbreakable!*'

'*That's as may be – but you did not invent it.*'

'*Are you challenging me?*'

'*Well, yes, all right then, you imbecile.*'

'*Let's see you crack it, then!*'

So Babbage, who could not resist a challenge from someone so obviously brain-dead, even if the challenge was absurd, eventually

supplied us with our method. Babbage was a bit like this. As well as inventing the Difference Engine, he also invented the speedometer, the cowcatcher (a device fitted to trains to clear cattle from the tracks) and the basis of the modern postal system, where a letter can be sent anywhere in the country for the same price. He noted that if you could find patterns in a cipher like the one above, say the two instances of the trigraph KHM, you should then proceed the following way. Assuming you had a much longer piece of ciphertext, you would find as many instances as possible of repeated clusters of letters. Then you would count the letters from the beginning of each cluster to the beginning of the next. In our example above you would find twelve letters between the first K and the next one. What this tells you is that the keyword (the one that is written repeatedly above the plaintext during encipherment) must have a number of letters that is a factor of twelve i.e. 12, 6, 4, 3, 2 or 1, these being the numbers that divide into twelve. This makes sense, as we are assuming that the same letters repeat after twelve characters, in both the keyword and the plaintext message, resulting in the repeated cluster in the ciphertext. A two-letter key would have repeated six times before starting again; a twelve-letter key only once. With a longer piece of text it would be possible, usually, to narrow down the factors until the length of the word was obvious.

What happens next is rather complicated. If you had discovered that your keyword was four letters long, you would go through and label each letter in the ciphertext with a 1, 2, 3 or 4, depending on whether it would have been enciphered using the first, second, third or fourth letter of the keyword. Then you would perform frequency analysis on each set of letters; so for the letters marked with a 1, you would come up with a distinct frequency table which you could then compare with a list of normal frequencies. You would proceed the same way for each set of letters until you had each letter of the keyword, at which point you would decipher your message.

But this is not how I do it.

What I do is as follows. First of all I proceed the same way as Babbage would have done, trying to guess the length of the keyword by counting and factorising the letters between repeated clusters. But then I would be trying to find a short cut, being quite a fan of short cuts and not so much a fan of doing things the 'right' way,

or going the long way around in general. So what I always do next is look for every repeated trigraph in the text and then go through trying each one as 'the'. I would be lucky with the sample above, as the first word is, of course, 'the'. I would work the letters KHM back using the Vigenère square (if K equalled 't', then the line of encipherment would have been R; if H equalled 'h', the line of encipherment would have been A and so on) and rather quickly come up with the following to work from: I would have a keyword that has a number of letters that is a factor of twelve and which possibly begins with the letters RAI. Intuition immediately tells me this could be the word RAIN. In fact, when I check in my dictionary I find other words that would fit as well: RAID, RAIL, and RAISIN, each being a word beginning with RAI and having a number of letters that is a factor of twelve. So what I do next is simply try them all. And of course, when I put the letters of the word RAIN repeating above the ciphertext, it unscrambles nicely.

I look down at my notebook, in which I have written the following:

XYCGKNCJYCJZSDSPPAGHDFTCRIVXU ?????????? CJ and CJ?? Repetition too soon.

The message is simply too short to have any useful patterns. Not that many short phrases actually contain convenient repetitions of the word 'the' or 'and' anyway. I yawn. Why has someone sent me this? Do they want me to read it or not? I sit there, listening to the noises outside in the dark, thinking how stupid this whole thing is. Why send a message with no key? I mean, it's not as if I intercepted this – it was sent to me!

I am staring at the piece of paper so intently that it starts to blur beneath my eyes. The letters of the code merge and smudge together with the PopCo logo in the top left-hand corner and the *With Compliments* lettering in the middle. And then I suddenly wonder: is the key in fact here, with the message? Vigenère used the concept of a 'priming key': could there be one here too?

With my heart playing fast percussion, and my brain suddenly alert, I write the ciphertext out on my pad again, cleanly, and write the letters POPCO repeating on top of it. My makeshift Vigenère square, which I have drawn on a piece of paper, gives me the following result:

P O P C O P O P C O P O P C O P O P C O P O P C O P O P C
X Y C G K N C J Y C J Z S D S P P A G H D F T C R I V X U
i k n e w y o u w o u l d b e a b l e t o r e a d t h i s

I knew you would be able to read this. What kind of message is that? And who has sent it to me? I don't like this very much, and the late-at-night factor doesn't really help. I can't relax now, so I pace the room smoking roll-ups until it is calm-ocean blue outside and only then do I get into bed.

after asking directions to the museum (around the corner and down the hill), I leave. The package in my bag is knocking around. *Open me. Open me.* But I can't open it until I am sitting down somewhere relatively private. Perhaps a quiet coffee shop? I walk on. A normal-looking hiking shop and photographic shop are huddled in amongst an ethical shoe shop, a small organic supermarket and a big, swollen coffee-shop, whose frontage takes up the whole of the large corner. I don't fancy this place but there is a sign pointing down a tiny side street. An arrow and one word: Café.

I almost miss the door. It's tiny. Inside, there is a wooden floor and a few tables, some pretty plants and a piano in the far right-hand corner. It's almost empty so I pick a table at the back and sit down. What am I going to order? I have been eating vegan food for the last few days and I do feel a compulsion to continue the experiment. Will it get boring? Will I waste away? Only time will tell. I order a black coffee and some wholemeal toast with marmalade and no butter. Then I get the package out of my bag.

It's a white padded envelope, wrapped with clear Sellotape. My name is written in inky blue capitals. Whoever sent this has cleverly or accidentally Sellotaped over my name. When I remove the Sellotape, the blue writing disappears, ripped off in a second. At least I know this hasn't been tampered with since it was sealed. Once I have eased open the flap, I reach in my hand and pull out the contents. It's a small book that I would recognise anywhere. I drop it on the table, my hand shaking. It's a 1979 Women's Press edition of *Woman on the Edge of Time*. The same copy I have at home, the one my mother left me all those years ago. Of course it's not my copy: there's no writing inside. But there is a sheet of paper, neatly folded in two.

Someone comes to the table, looking for somewhere to put down my coffee and toast. I move my bag, and the book, and mumble some sort of thanks. My hands are still shaking. Can I risk a cigarette? Maybe half of one. Maybe in a minute.

'Can I smoke in here?' I ask the guy just as he wanders off.

'Yeah, sure. I'll bring you an ashtray.'

I'm not hungry any more, but I eat the toast quickly anyway, not wanting to waste it. The coffee is strong and rough in my mouth and I take three more shaky sips before I wipe my hands on a paper napkin and reach for the book. A small, handmade ashtray appears

on the table. I roll a thin cigarette, light up and cough experimentally. It feels OK – well, except for my head being almost blown off by the sudden rush of chemicals and nicotine. The room blurs and comes back into focus again. The book. I open it and take out the sheet of paper.

Here, at least, I find what I expect. A list of numbers:

263, 18; 343, 9; 363, 97; 363, 98; 325, 27; 106, 120; 300, 52; 20, 7; 71, 40; 92, 18; 151, 60; 258, 6; 71, 40; 58, 38; 104, 5; 34, 143; 342, 18; 342, 19; 342, 20.

I take out my notepad and pencil and turn to page 263 of the book. Word 18 is *don't*. Don't what? I am just turning to page 343 when the little door clatters and a bunch of PopCo people come in: Grace, Kieran, Frank, James and Violet. Shit. I quickly stick the book and the sheet of paper back in my bag before they see me. Then I make a little doodle in my notebook, as if this is what I was doing all along.

'Well, this is a nice little place,' Kieran's saying, in his loud drawl. 'Oh, look. There's what's-her-name.'

'Alice,' says Violet.

Sitting in a café on your own is always great until a group of people you know walks in. Now they've said my name, I have to look up.

'Hi,' I say.

'How's it hanging?' Kieran says. 'Are you digging this medieval town thing as much as we are?'

'Yeah, it's nice,' I say.

'We'd join you, except . . .'

'No, no. I'm just going anyway,' I say.

I gulp down the rest of my coffee and put out the cigarette. I pay at the counter and leave quickly. Where can I go to decode this message in private? I join the main street again and turn left down the hill. I walk through a tiny covered parade of shops in medieval-looking houses on one side of the street, while a busy market hisses and hums on the other side of the road. I see Boots in the distance, with no animal liberation stands outside it, nothing at all. I walk past a boring-looking bookshop with shiny, corporate bestsellers in the window, and a world music shop. There must be somewhere I can go to do this. Then I come to the small museum. *Of course.*

Feeling rather paranoid, I check I haven't been followed and then duck inside. The burble of market traders, cars, children and swishing carrier bags stops as if someone has thrown a switch. I am in a cool, silent room with a polished wooden floor and a desk on the far side. I walk over, past racks of T-shirts with pictures of the castle and the museum on them, local history books and historically inspired toys: finger puppets, cut-out dolls, the sort of things PopCo stopped making in the 80s.

'Hello,' I say to the elderly woman behind the desk. 'One adult, please.'

'Are you a resident of Totnes?'

'No,' I say, looking down at a pile of leaflets advertising some of the exhibits. I glance at the picture on the front of one of them, showing that this museum used to be a merchant's house. Inside, there is information about current exhibits. There's a Victorian apothecary display, a historical costume display and – what's this? – the Charles Babbage Room? This is too weird. Why would they have a Charles Babbage room here? He worked in London, I know that. It was from London that he waged his relentless campaign to ban organ grinders and street musicians. I shake my head the way you do when you are trying to shake dreams and illusions away, and look again. *Charles Babbage Room*, it still says.

'That's £1.60,' the woman says.

I get out the change. 'I'm interested in the Charles Babbage Room,' I say.

'Oh yes,' she says. 'It's the room at the top of the house. History of computing. Very popular. It's those stairs there that you want.'

The wooden stairs creak as I walk up them. Are there any other people in the whole museum? It doesn't sound like it. I pass one floor, then another, going, I think, forwards in time the higher I climb. There are nooks and crannies and I can see rooms with sloping floors, a sign to the apothecary display and various snatches of period costumes. When I reach the top floor, I am actually awed and almost frightened by the silence and stillness here. There's a sign. *Charles Babbage Room*. I go in. And there, in the corner of the room, is Babbage himself, sitting at the desk.

'Oh my God,' I yelp, springing back.

If he looks up at me I will die on the spot. I will die. I look back. Nothing happens. I look again. It's a life-size model, posed at the

desk like a waxwork. Who would do that? This is one of the scariest things I have ever seen. He's so . . . real. I'm sure his plastic eyes follow me as I walk around the room, looking at pictures of models of the Difference Engine and plans for the Analytical Engine (the real ones are in museums in London). I discover that Babbage was born here and has had a road on a local industrial estate named after him. I look at displays about the history of computing; a frieze about Babbage's life. In a glass display case, there are little ZX Spectrums and a BBC Microcomputer that look almost as old as the Difference Engine.

On the far wall there is a portrait of Ada Lovelace. I go and look at it. *Ada Lovelace, daughter of Lord Byron*, a caption says. A printed sheet tells me things I already know: her mother didn't want her daughter tainted by poetry the way her father had been, so had her schooled in mathematics and science instead. In 1843, Ada married the Earl of Lovelace. When she translated an Italian summary of Babbage's plans for the new Analytical Engine, Babbage suggested she add her own notes. These notes turned out to be three times the length of the original article. Ada and Charles continued to correspond. Ada wrote an article that was published in 1843. In it, she predicted that the Analytical Machine could be used to compose complex music, to produce graphics, and for both artistic and scientific endeavours. Her predictions turned out to be correct. She was my grandmother's heroine.

No one is coming, Alice. Relax. Can I do the decode here? Is anyone else going to come and look at Babbage? I suppose I will hear the creaking steps if anyone does come. I work out that I will have at least a minute-and-a-half's warning of anyone coming up here, and slip down on the floor under the picture of Ada Lovelace, my legs crossed on the hard wooden floorboards, my bag by my side, ready to abort this mission if need be.

Don't. That's the first word. OK. I flick to page 343 of the book. The 9th word is either 'go' or 'to', depending on whether my correspondent has counted a hyphenated construction (self-educated) as one word or two. *Don't to.* Well, that doesn't make sense. *Don't go* . . . Bloody hell. Who has sent me this? The next two numbers are similar: 363, 97 and 363, 98. Two words together. I flip to page 363 and count words. Word 97 is 'fight' and word 98 is 'back'. *Fight back.*

I sit there counting words for the next ten or so minutes until I have the following: *Don't go fight back struggle against corporate enemy meet in your room to night at eight it's a war.* Bloody hell. Refusing for a moment to actually digest the meaning of this, I suddenly think of Francis Stevenson, and the mystery text he used to code his treasure map. I remember my grandfather explaining that you always have to think about what sort of books would contain the right words to create a particular kind of message. I look at the language of this one. Fight, enemy, corporate, war, struggle. You wouldn't find any of those words in the horse book I sent. I smile at the broken-up nature of the word 'tonight', written as two words in the message. You wouldn't think so, but sometimes it's hard to find a simple word like *tonight* in even a long text. *Woman on the Edge of Time* is written in the past tense, which means that you would only find a present-tense word like 'tonight' in a piece of speech.

But maybe none of this matters right now. I read the message again, inserting my own punctuation. *Don't go. Fight back. Struggle against corporate enemy. Meet in your room tonight at eight. It's a war.* Who is this from? What is going on? And then it hits me. I didn't think the enemy existed. Then I realised it was me. Then I decided to desert. Now – is this possible? – I am about to find out that there is another side. I suppose there has to be, if there is an enemy. My mind is running the tape of the last couple of weeks again, like a password-descrambler checking every letter in every space to see what fits. I can almost hear the click, click, click as faces, coincidences, events fall into place. And, suddenly, I think I can make a pretty good guess about who will be coming to my room tonight. It's like playing Cluedo, really.

There's a sound, like marbles falling onto concrete, and the patch of sunlight in the room suddenly disappears as if it was a rug that someone had simply pulled away and rolled up. It's funny how dark it is in here now that the sunlight has gone. I shiver. It's cold, suddenly, too. Babbage's eyes still seem to follow me as I get up and go to the window. Hailstones as big as gobstoppers are falling from the sky. I stand in the chilly, dark silence in here and watch as people outside duck into shops and doorways or open their just-in-case umbrellas. One man runs down the suddenly deserted pavement with a supermarket carrier bag over his head. A smell of wet leaves comes through the window.

Change the world. Has my mother been time travelling again? Has she violated some cosmic law to send me this book with this new message? Do I believe in coincidence? Do I believe in synchronicity? *Stop it, Alice.* Hail beats against the window and outside, people are still huddled in doorways, looking at the sky. I remember thinking I had encountered a huge coincidence once, when looking up a word in a dictionary. Usually, it takes me ages to find the right page but once, just once, I picked up the dictionary and opened it to the correct page immediately. *Amazing*, I thought. Then I worked out that, since I have been using dictionaries all my life, the probability is that this would have to happen at some point. There's what, a thousand pages in a dictionary? When you open it, there's therefore a 1/1000 chance you will open it on the page that contains the word you are looking for. These odds are greatly reduced by the fact that people don't open dictionaries randomly: they aim to open it as close to the word they want as possible. If you are searching for a word beginning with 'C', you don't open the dictionary at the end, you open it fairly close to the beginning, where you guess the 'C' section might be. It is likely then that you will hit the correct page more than once in a lifetime, especially if you use a dictionary a lot (although it could, of course, happen the first time you ever use one).

Probability – remember – also proves that, if you get twenty-three people in the same room, you will have a 50 per cent chance of finding that two of them share the same birthday. Probability is a funny thing, something that humans don't intuitively understand. We declare as coincidence events which aren't actually that unlikely, mathematically. It's like the story of Marilyn vos Savant and the Monty Hall Problem. *Of course* you have a greater chance of winning the car if you swap doors. There was a two in three chance you made the wrong choice in the first place, so you should definitely swap. But, when Marilyn vos Savant said this, even Erdös was convinced she must be wrong. But she wasn't. She got hate mail from male mathematicians saying she was wrong, but she wasn't.

So, you've picked one of three doors. You've been shown a goat. Do you change doors? You've chosen a life that seemed to make sense. But there are two other options. One is, perhaps, a goat. One is a mystery. Do you open the mystery door? Do you abandon the game and (metaphorically) embrace the goat? What's wrong