What ARE YOU?

The influence of Charles Darwin's evolutionary theory in Lewis Carroll's *Alice's Adventures in Wonderland* and *Through the Looking-Glass*

MA Thesis Literary Studies
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"Dear, dear! How queer everything is to-day! And yesterday things went on just as usual. I wonder if I've been changed in the night? Let me think: *was* I the same when I got up this morning? I almost think I can remember feeling a little different. But if I'm not the same, the next question is 'Who in the world am I?' Ah, *that's* the great puzzle!" (Carroll 17-18)

Introduction

This thesis explores the impact of evolutionary theory on narrative form in Lewis Carroll's *Alice's Adventures in Wonderland* (1865) and *Through the Looking–Glass and What Alice Found There* (1872). I shall argue that Lewis Carroll was inspired and influenced by Charles Darwin's evolutionary theory in writing the *Alice* books. Already in the opening chapter of *Alice's Adventures in Wonderland* one is confronted with the question about Alice's identity: "'Who in the world am I?'"(18). In a book where riddles and puzzles proliferate, the answer to this question is perhaps the greatest puzzle of all for Alice. Both of the *Alice* books might at first look like a dream, a fantasy, but this dreamworld is overshadowed by a search for human identity and with that the fear of changing and unstable bodily forms, time, mortality, and extinction. This identity crisis is central to our understanding of these texts, since Lewis Carroll and his fellow Victorians were provoked by the publication of Charles Darwin's *On The Origin of Species* in 1859 to throw identity into question. Darwin's observation that Man and animals have the same ancestor threatened received ideas concerning creation and the descent of humans in general.

Lewis Carroll was the pen-name of the Reverend Charles Lutwidge Dodgson (1832-1898), a lecturer in mathematics at Christ Church College at Oxford University. This college was so prestigious that Queen Victoria herself visited the deanery in 1860. It was here, at this deanery, that Dodgson met Alice Liddell - the daughter of the Dean Henry Liddell. Mid-nineteenth century Oxford considered itself to be a centre of British intellectual life. It is therefore no coincidence that a famous public debate on Darwin's evolutionary theory took place here in 1860, a year after Darwin's publication. Bishop Samuel Wilberforce and biologist Thomas Huxley, amongst others, clashed over Darwin's evolutionary theory, with Wilberforce being against it and Huxley presenting himself as an advocate for Darwin's theory. Hugh Haughton, the editor of 1998 Penguin Classics edition of the *Alice* books, comments in his introduction: "The obsessively tidy Dodgson was acutely concerned by

contemporary debates which threatened the established order" (l). The echoes of such contemporary debates in the *Alice* books are muted and indirect, but nevertheless intrinsic.

This thesis will have five chapters which investigate Dodgson's indebtedness to evolutionary theory by placing his books in a cultural-historical perspective. The last chapter, chapter 6, will analyze the presence of specific aspects of evolutionary theory in the *Alice* books by means of a close reading of the two novels. All quoted passages from the *Alice* books pertain to the Penguin Classics edition which contains both novels in one book, an excellent introduction by Hugh Haughton, and the original illustrations by John Tenniel. Throughout the thesis I shall refer to the author as Lewis Carroll, even when my discussion might concern his personal life, his diaries, and correspondence. I have chosen to do so in the first place, to create a unity within this thesis, and in the second place to avoid confusion when bringing up his family members. I trust that my readers will understand that Carroll used his real name, Charles Dodgson, concerning private and personal matters.

Chapter 1 will concern the overlap of art and science in the nineteenth century. At the time it was very common for literature and science, or natural history as it was called back then, to have a far broader definition than it does now. Being an educated person in general meant that one should be competent in science, as well as in the arts and history. The chapter tries to reduce the gap, which at first seems so obvious, between Lewis Carroll as an author and Charles Darwin as a scientist. The first was a successful mathematician who divided his time between lecturing in Oxford and writing novels, poems, and photography. The latter using an uncomplicated vocabulary in his work, rich in familiar literary and philosophical quotes. That hard line between the arts and sciences we have nowadays did not then exist.

The second chapter provides an overview of evolutionary theory before Charles Darwin. Evolutionary theory was not new in the Victorian period: for millennia human beings tried to answer the question on the origin of life. Many previous natural philosophers had paved the way for Darwin to publish his work.

The long history of mythical, philosophical, biblical, and scientific research and ideas on evolution was already known to Victorian scholars like Lewis Carroll.

Chapter 3 examines the theory of evolution as set out by Charles Darwin. If one wants to point out in the close reading the references to his theory, one needs to know what his theory was really about, and needs to have at least a layman's understanding of the most important principles. This chapter will also explore how and why Charles Darwin and his theory were much more known to the greater public than any other scientist before him. This is necessary, of course, to point out that Lewis Carroll must have known at least something about Darwin's work.

The high Victorian and Edwardian periods are also sometimes described as being as the Golden Age of Children's Literature, an age in which children's books were published for the first time without a strongly didactic and religious subject and tone. That is why Chapter 4 researches this new phenomenon, investigating a situation where books were written purely for children and could include fantasized, fictional storylines fitted for the imaginative world of children. Due to the limited length of this thesis, a less elaborate close reading will be included of Charles Kingsley's *The Water-Babies*, published in 1863. Besides the fact that *The Water Babies* acts as a good example of the new kind of Victorian children's novel, it also discusses ideas on evolution. Kingsley's influential text is therefore a perfect early example of this new tradition in children's literature, a tradition soon furthered by Carroll himself.

Chapter 5 entirely revolves around Lewis Carroll and examines the ways in which he too can be taken to be a writer strongly engaged with developmental theories, and therefore an evolutionary writer himself. By researching his personal documents, such as his extensive diaries written during his lifetime and his large correspondence, I will demonstrate that there are clear references to Darwin, his theory, and Carroll's interest in evolutionary scientists preceding Darwin. His love for the relatively new art of photography is discussed here since his objects reflect hints of evolutionary theory. In particular I shall analyze his photographs concerning several human and animal skeletons. Carroll's interest in children and the idea of the

perfect childhood will also be addressed because growing and growing up echoes evolutionary theory within a single life cycle.

Finally in Chapter 6, the framework created by the previous chapters, allows us to dive in deep into the evolutionary structures of the *Alice* books. With all the knowledge on evolutionary theory, the Victorian period, children's literature and Lewis Carroll, we can research - at last- for references in the texts. I will try to make connections between certain passages and characters in the books like the Pigeon, the Caterpillar, the Fawn, and The Mad Tea-Party, and aspects of evolutionary theory. Lewis Carroll proves to be inspired by evolutionary terms like 'time' and 'classification'.

Much has been written before on this subject, for example by Gillian Beer in *Darwin's Plots, Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction* (1983) and more recently in *Alice in Space, The Sideways Victorian World of Lewis Carroll* (2016). I have consulted both works extensively as they both concern and overlap with my thesis, just as I have done with the works of Rose Lovell-Smith, whose "The Animals of Wonderland: Tenniel as Carroll's Reader" (2003) and especially her article in *Children's Literature*: "Eggs and Serpents: Natural History Reference in Lewis Carroll's Scene of Alice and the Pigeon" (2007) proved to be very fruitful when analyzing that specific Pigeon scene in the first *Alice* book. Although Gillian Beer has a leading role in analyzing evolutionary thought in literature in general, and Lovell-Smith in the *Alice* books specifically, both treat the books as a children's novel and therefore analyse the books as such. I believe that children's literature in general might suffer a lack of appreciation as it is considered to be a different class altogether. By demonstrating the scientific and very much 'mature' theme of evolution in the *Alice* books, I hope to show that this type of work can be every bit as much complex and rewarding as any other work of literature. When one treats this genre as standing on the same level as any other form of literature, I hope it will be given the appreciation and attention it so much deserves.

Chapter 1

"And what is the use of a book without pictures or conversations?"

The art of science in the nineteenth century

For centuries, discussions of human origins and behaviour have been dominated by theologians and philosophers. Consequently, when scientists, or natural philosophers as they were called then, doubted these origins they had to defend their right to address these questions. Like literary writers, they often did so by incorporating the voices of accepted authorities, particularly those of religious texts. In the nineteenth century the term *science* became known for the study of the natural and physical world. Until that time, science was noted as any sort of knowledge or skill, including the science of boxing. Before the word 'scientist' was first coined, the term in use was 'natural philosopher'. In *Literature and Science in the 19th Century,* Laura Otis describes how the difference between the arts and science was never an issue in the nineteenth century, although there were some debates on what the term *art* and *science* incorporated, and how much time a university student should devote to each. In the popular press the two disciplines mingled as well, and were accessible to all readers. Scientists quoted famous poets and novelists, and authors we now identify with the arts and creativity, explored the implications of scientific theories.

The common twenty–first century complaint on the difficult language in scientific texts did not exist in the nineteenth century. Periodicals, newspapers, magazines, and articles on scientific research were set side by side with fiction, poetry and literary criticism (Otis 19). Science was a variety of literature with new knowledge expressed in familiar words. Many scientists showed their familiarity with canonical texts of the Western literary tradition, which resulted in them being seen as well-rounded, educated people and gave them the credibility to obtain an audience and make a good impression in society. Charles Lyell - Darwin's friend and former teacher - quoted, for example, Milton and Wordsworth to present geology as a respectable, gentlemanly pursuit. When nineteenth century scientists quoted

fiction, poetry or classical Greek and Roman texts, they not only defined their knowledge as cultured but also as non-threatening. Darwin, being a Victorian himself, knew how deeply his new theory could threaten the traditional understanding of a man's place in the universe. Therefore he chose to present the theory of evolution as complementary to religious teachings, not as a replacement. Darwin opens *On the Origin of Species* with a quote from the British philosopher Francis Bacon (1561-1626):

> To conclude, therefore, let no man out of weak conceit of sobriety, or an ill applied moderation, think or maintain, that a man can search too far or be too well studied in the book of God's words, or in the book of God's works; divinity or philosophy; but rather led men endeavour an endless progress proficient in both. (1)

Here is the classical statement that there are two ways of understanding the character of God, through the Bible, and through the world he has made. Bacon is considered to be the man primarily responsible for the formulation and establishment of the so-called "scientific method" in science, stressing experimentation and induction rather than philosophical deduction carried out by many of his predecessors. It is therefore no coincidence Darwin chose to quote Bacon, as Darwin's research methods consisted out of observation and empiricism.

Darwin often illustrates his factual evidence with lively examples, scenes which would help readers to picture natural selection at work. He managed to make the readers interpret familiar events in new way. Nineteenth century periodicals, for example, offered numerous travel narratives, responding to a cultural desire to see the world (Otis 22). When Darwin presented his theory, he knew readers were used to such voyages, and he drew on their capabilities to recreate the evolutionary process. Nonetheless, Darwin had a little doubt that his literary approach would lead readers astray. The term natural selection could evoke an idea of an active agent doing the selecting (Beer 123). Throughout the book, the word 'nature' has been capitalised. At some point, 'Nature' comes across as a personification, a metaphor. Considering Darwin only wanted to stimulate his readers into his theory, his use of

metaphors and personifications could have been intentional (Otis 22). Just like many nineteenth century literature writers, scientists sometimes created characters to embody challenging ideas in which 'God' or 'Man' do not play a central role. Scientists, as well as literary writers, relied heavily on imagination. The comparison of the unknown with the known can create new forms of understanding, and therefore metaphor plays a key role in explaining an original thought. Metaphors can allow new insights without the consequences, and by picturing the unknown many scientists acted like novelists and poets by inviting readers to their – until then - hidden world of physical or biological events. As Gillian Beer has observed in *Darwin's Plots*, scientific writing is most like fiction when it is struggling to say something new at which time it relies heavily upon comparisons (314).

Scientific writing is not literature and to reduce science to literature by insisting that science is a kind of writing misrepresents the work of authors in both fields. Literary and scientific writing have different goals and, usually, different reading contexts. To do justice to both, it is important to study the differences as well as their similarities. There is no doubt that, in the Victorian era, scientists and novelists actively reflected upon the affinities and differences between their tasks (Otis xix). Anyone who read the works of successful scientists could see immediately that most good scientists were also imaginative writers, like Charles Darwin. Lewis Carroll, who we all know for his literary work, was a lecturer in mathematics at Oxford. In his work - especially in *Alice's Adventures in Wonderland* and *Through the Looking-Glass* - he played with physical and biological phenomena. Carroll's main goal was to entertain, to leave an impression in a literary sense, not to explain his readers a scientific theory. This gives Carroll, and many other novelists, a freedom which scientists do not have: *they* still had to maintain a distance to be taken seriously. Scientific theories, like those by Darwin, offered novelists the opportunity to challenge the accepted views of human nature by interweaving these new narratives into their traditional stories.

The innovative use of well-known tales was essential to literature as it was to science (Otis xx). Novelists of the period were greatly concerned with facts and

performed careful research in order to make their work not only credible but historically accurate. In the nineteenth century, romantic writing - in which imagination was praised as the prime source of literary inspiration - increasingly gave way to realistic and naturalistic narratives in which the storyteller shared many goals with scientific writers. Although the *Alice* books depict imaginative worlds, these worlds are described in great naturalistic detail:

> "And yet what a dear little puppy it was!" said Alice, as she leant against a buttercup to rest herself, and fanned herself with one of the leaves…Alice looked all around her at the flowers and blades of grass…There was a large mushroom growing near her, about the same height as herself; and, when she had looked under it, and on both sides of it, and behind it, it occurred to her that she might as well look and see what was on top of it. She stretched herself up on tiptoe, and peeped over the edge of the mushroom, and her eyes immediately met those of a large blue caterpillar, that was sitting on the top, with its arms folded, quietly smoking a long hookah, and taking not the smallest notice of her or anything else. (Carroll 38-39)

Many Victorians would have recognized this detailed description from their natural history books. In a classical Victorian zoological illustration, a subject was often illustrated against a minimal background, to show the size of an animal and the detail of its depiction (Lovell-Smith 31). With the image of Alice being able to rest against a buttercup and at the same time fanning herself some fresh air with its leaf, the readers have a good idea of what a small height Alice, at this moment, really has. Even the detailed description of the caterpillar can be seen as deriving in part from a naturalistic discourse. At first this might seem a bit odd; the caterpillar is more human than animal, smoking a hookah, and being described and illustrated with human arms. Before Carroll teamed up with Sir John Tenniel to illustrate his novel, he made an effort to illustrate the first editions himself. In his diary dated 10 March 1863, he "called at the Deanery to…borrow a Natural History to help in illustrating Alice's Adventures" (Carroll The Diaries of 193). Carroll knew that the Liddell family

owned an illustrated natural history book, as he and the Liddell children often looked at it together (Lovell-Smith 29). In general, young children are mostly interested in the illustrations in a natural history book or indeed in any book at all; this is something Carroll understood very well.

One can conclude that novelists in the Victorian period were not *just* familiar with scientific texts; they even felt comfortable integrating the themes of these texts into their own literary work. It is against this background that Carroll wrote his novels.

Chapter 2

"No wise fish would go anywhere without a porpoise"

Evolutionary theory before Charles Darwin

Throughout history humans tried to answer questions on the origin of life. There were many myths about creation among the Greeks and Romans, and these myths have many parallels in other mythologies, such as Egyptian, Sumerian, Babylonian, and Hebraic. Many teachings of the early days have not survived or have not survived completely. In classical antiquity, the earliest complete teachings about the origin of life can be read in the retellings or poems of later writers, such as the third century Roman writer Censorinus. Although there were many Greek writers and poets who embraced the mythical and religious explanation on the origin of life, in which every form of life is created individually, several Greek philosophers suggested that life might have evolved gradually. Anaximander (c. 610-546 BC), a Pre-Socratic Greek philosopher, tried to observe and explain different aspects of the universe with a particular interest in the origins. He claimed that everything in nature had its role, just like people have in human societies, and anything which does not fit within those roles disturbs the balance of nature, and consequently does not last long. He took into account the existence of fossils, and claimed that animals sprang out of the sea a long time ago. The first animals were born trapped in a spiny bark, but as they got older, the bark would dry up and break. As the early humidity evaporated, dry land emerged and, in time, humankind had to adapt:

> Anaximander of Miletus considered that from warmed up water and earth emerged either fish or entirely fishlike animals. Inside these animals, men took form and embryos were held prisoners until puberty; only then, after these animals burst open, could men and women come out, now able to feed themselves. (Censorinus iv, 7)

He puts forward the idea that humans had to spend part of this transition inside the mouths of big fish to protect themselves from the earth's climate until they could

come out in open air and lose their scales. Although his ideas were rather fanciful and Anaximander had no theory of natural selection, some consider him as evolution's most ancient proponent. These pre-Darwinian concepts illustrate the beginning of a phenomenon sometimes called the *Greek Miracle*, which tries to explain the nature of the world within material -rather than mythical- principles (Freeman and Herron 39). It also suggests that there have always been evolutionary concepts to understand the world as a whole. At this point in time there was not any proof of how it might actually work in reality. The thought of animals evolving and changing through time can be considered a first step into Charles Darwin's theory of evolution. Also, the idea that water transforms and changes animals, is something which is very close to what most scientists believe to be the actual beginning of all life, with its evolving micro organisms in the oceans.

For the post-Socratic philosopher Aristotle (384 - 322 BC) the real world, our visible world, the one we live in was the only world. Abstract ideas, like a preordained design, are based on this perceptive world, not the other way around. He saw all natural things, not only living things, as being a perfect realisation of different fixed natural possibilities in a cosmic order. The qualities that make a horse a horse, are eternal and fixed, but this *idea* can only be originated after visually seeing a couple of horses in the real world (Beer 73). Aristotle emphasizes the importance of empirical research, instead of only having a theoretical approach. He is one of the first to begin the tradition in which nature is something to be understood by observation. Although he researched many animals and plants, he still pursued the theory that there must be a divine power which was behind all of it: a power that triggered nature in motion, and gave each creature a purpose. The wisdom of nature is that it always ensured a perfect adaptation to every creature, preventing any possibility that any species could become extinct. Although – in *Physics* - he considered the option that we live in a world where natural objects generate their own laws, he rejected the idea of randomness in nature: "Yet it is impossible that this should be the true view. For teeth and other material things either universally or normally come about in a given way; but of not one of the results of chance or

spontaneity is this true" (ii, 8). The absence of a certain goal implies an absence of order which made Aristotle reject an idea of natural selection over time. In a similar fashion, Aristotle believed that creatures were arranged in a graded scale of perfection rising from plants on up to man, the *scala naturae*. His system had eleven grades, arranged according "to the degree to which they are infected with potentiality", expressed in their form at birth (Lovejoy 32-35). Aristotle separated plants from animals because of their vegetative or feeding soul. Besides a vegetative soul, animals also obtain a sensitive soul, whereas humans have a third and extra rational soul (Peeters 11). Dutch philosopher Norbert Peeters argues that this ranking is misplaced: although the complexity of plants might not always be visible, it is present nonetheless. Peeters uses the term 'plant blindness' to describe the urge to rank animals, including humans above plants. Aristotle's particular organisation of nature profoundly shaped medieval scholarship. In the sixteenth and seventeenth centuries, scientists and philosophers like Francis Bacon (1561-1626) and René Descartes (1596-1650) already argued that science should have an empirical basis, rather than a philosophical one. However, it was not until Darwin published his work on botany that Aristotle's ranking order of nature stopped being self-evident (12). Many people seem to forget that Darwin not only shortened the distance between man and animal, but also the distance between animals, including humans, and plants. This is already visible in Lewis Carroll's *Alice* books where the desire to see a garden plays a big part in the opening of both books. In *Wonderland* Alice:

> opened the door and found that it led into a small passage, not much larger that a rat-hole: she knelt down and looked along the passage into the loveliest garden you ever saw. How she longed to get out of that dark hall, and wander about among those beds of bright flowers… (Carroll 12)

In *Wonderland* Alice faces many challenges to get into the garden (she has to eat and drink precisely the right amount of food), whereas in *Through the Looking-Glass* it is much easier for her to enter this garden. She comes upon a large flower-bed with daisies and in the middle a willow tree:

> "O Tiger-lily!" said Alice, addressing herself to one that was waving gracefully about in the wind, "I *wish* you could talk!" "We *can* talk", said the Tiger-Lily, "when there's anybody worth talking to"…"And can *all* the flowers talk?""As well as *you* can, "said the Tiger-Lily. "And a great deal louder."

In *Through the Looking-Glass* Alice is not only observing a beautiful garden, she becomes a part of it. Carroll expands this by ranking the flowers at the same level as her. They only talk when they need to, which concludes that Alice is not that interesting to talk to, she is nothing special although she might be human. They even go a bit further making the remark that Alice might "never think at all" and that they "never saw anybody that looked stupider" (138). The Aristotelian theory of only humans possessing a vegetative, sensitive and rational soul is being questioned now that the plants outsmart her; leaving her behind quite astonished.

The sixteenth- and seventeenth-century scientists already made space for key thinkers like Erasmus Darwin (1731-1802) by adding the method of empirical research, relying on the method of testing by experiments instead of only observing one's object (Freeman and Herron 23). Erasmus Darwin, grandfather of Charles Darwin, was an English physician and an important member of the Midlands Enlightenment, which was a scientific, cultural and political manifestation of the Age of Enlightenment in England. The Enlightenment took place in eighteenth century Europe and consisted of a philosophical movement which focused on reason as the main authority, rather than religion. Erasmus Darwin proposed that all warm-blooded animals could have descended from a single micro-organism, and published his research in *Zoonomia* (1794), his most famous work. His book contains a specific chapter on the topic of generation. Erasmus follows up with the conclusion that one and the same kind of living filament is and has been the cause of all life:

> Would it be too bold to imagine, that in the great length of time, since the earth began to exist, perhaps millions of ages before the commencement of history of mankind, would it be too bold to imagine, that all warm-blooded animals have arisen from one living filament,

> with THE GREAT FIRST CAUSE endued with animality, with the power of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions, and associations; and thus possessing the faculty of continuing to improve by its own inheritant activity, and of delivering down those improvements by generations to its posterity, would without end! (xxix, 4.8)

Erasmus' idea that humans have evolved, or "have arisen" from one and the same organism has undeniably been a strong onset in the theory of evolution as we know it today. Although Erasmus predates Jean Baptiste Lamarck (1744-1829), he follows Lamarck's notion that all species, including humans, are derived by gradual evolution from other species. Lamarck had already published this idea in his *Zoological Philosophy* in 1809. Erasmus addition to this theory is that nature induces "improvements" of "new propensities" which should cultivate the species. This addition is almost identical to the future theory of *the survival of the fittest* of his grandson Charles Darwin.

Jean Baptiste Lamarck was a French naturalist and great inspiration for the later ideas of Charles Darwin. He cited Lamarck as the first writer "whose conclusions on the subject exited much attention" (Desmond and Moore 63). Lamarck foreshadowed current thoughts on evolution in two main themes. The first theme was that all species have gradually evolved from other species. The second principle was that this process was driven by the inheritance of acquired characteristics and by an inherent tendency for all organisms to progress from simple to complex forms. To explain the continued existence of simple life forms, Lamarck suggested that they are continuously replenished by spontaneous generation from non living matter (Freeman and Herron 40). Valuable new traits and habits could be directly transmitted onto the next generation. If the experiences of all individuals could be recorded and passed on to their offspring, then all individuals born inherited their ancestors' memories and served as exact copies, holograms, of their species' development. According to Charles Darwin, individuals could not transmit newly acquired traits to their descendants and that is why he developed his theory of

natural selection which dictates that variations could only change a species by allowing their bearers to survive longer and produce more offspring. It contradicts the Lamarckian idea that will and habit can generate improvement, intention is the key thing in his theory (Otis 239). The idea that individual actions had a lasting effect appealed to people' sense of self worth which was an important theme in Victorian England. Lamarck's theory was in its way deeply satisfying, it shifts the source of intention away from a deity of God who created the world in one heap and places the source of creativity with the species themselves. Creatures can physically learn to adapt to their environment, which gives a self-controlling reassurance.

A critical breakthrough from the concept of fixed species was highly influenced by *An Essay on the Principle of Population* by Thomas Robert Malthus (1798). This principle suggested that population multiplies geometrically and food arithmetically. Therefore, the population will eventually outstrip the food supply and sooner or later population will be checked by famine and disease, leading to what is known as a *Malthusian Catastrophe* (Campbell and Reece 47). Malthus was an English cleric and scholar, influential in the fields of political economy and demography. Although his essay was written from an economical perspective, it became tremendously influential for the biological sciences in the future. Within this 'catastrophe' he argued that two types of checks hold population within resource limits: *positive* checks, which raise the death rate; and *preventive* ones, which lower the birth rate. The positive checks include hunger, disease and war; the preventive checks include abortion, birth control, prostitution, postponement of marriage and celibacy (Campbell and Reece 45). Charles Darwin used this theory to develop his own: *the struggle for existence*. As he describes it in *On the Origin*:"This is the doctrine of Malthus, applied to the whole animal and vegetable kingdoms" (4).

Charles Lyell (1797-1875) was a geologist and Darwin's close friend. Lyell was one of the first to believe that the world was ancient, and much older than commonly believed at that point in time. He based his thoughts on the geological anomalies of the earth he had researched. He later published geology-based evidence of the time Man had existed on earth as well. *Principles of Geology* (1830-1833), Lyell's first book,

was also his most famous, most influential, and most important one. It established Lyell's credentials as an important geological theorist, and introduced the doctrine of *uniformitarianism*. The doctrine was an assumption that the same natural laws and processes that operate in the universe now, have always operated in the universe in the past, and apply everywhere in the universe. It has included the concept that "the present is the key to the past" and is functioning at the same rates (Freeman and Herron 42). Geological remains from the distant past can, and should, be explained by reference to geological processes now in operation, and thus directly observable. The idea of 'time' completely changed after Lyell's theory: the earth and its inhabitants were so much older than initially thought, that it was indeed possible for species to evolve over many generations. With the use of ancient fossils, proof was given for the extinction of certain species. For both scientists and novelists, the knowledge that people have evolved from other life forms over *time,* made it possible and the more essential to tell their stories. In the *Alice* books Carroll plays with the notion of time in the opening scene, where Alice decides to follow the rabbit and falls into the rabbit hole. Where falling into a hole would usually be a fast experience, Alice has the time to notice, read and grab everything around her:

> Either the well was very deep, or she fell very slowly, for she had plenty of time as she went down to look about her, and to wonder what was going to happen next…she looked at the sides of the well, and noticed that they were filled with cupboards and book-shelves…She took down a jar from one of the shelves as she passed: it was labeled "ORANGE MARMELADE". (10)

Alice is just as surprised as any reader is: is it a very deep hole or is she falling in slow motion? Lyell's interpretation of geologic change as the steady accumulation of minute changes over enormously long spans of time was a powerful influence on thoughts of evolution so far, and made it possible for novelists like Carroll to use it for a fictional purpose.

Alfred Russel Wallace (1823-1913) independently discovered natural selection. Indeed, it was Charles Darwin's receipt of a manuscript sent to him by Wallace that

finally prompted Darwin to go public. Historians of science have noted that, while Darwin considered the ideas in Wallace's paper to be essentially the same as his own, there were differences. Wallace emphasised environmental pressures on varieties and species, forcing them to become adapted to their local conditions and leading populations in different locations to diverge. Darwin emphasised the struggle for existence within a certain group of species. Wallace appeared to have envisioned natural selection as a kind of feedback mechanism keeping species and varieties adapted to their environment (Desmond and Moore 530). Until the end of the nineteenth century Lamarck's theory of the inheritance of acquired qualities enjoyed more followers than the theories of Wallace and Darwin. Both scientists were well aware of the fact that their theories rejected the concept of 'will' as a force for change, which was the popular view of that time. In his essay "On the Tendency of Varieties to Depart Indefinitely from the Original Type", Wallace responded to Lamarck's theory that will and intention make it possible for species to change:

> Neither did the giraffe acquire its long neck by desiring to reach the foliage of the more lofty shrubs, and constantly stretching its neck for that purpose; but because any varieties which occurred among its antetypes with a longer neck than usual at once secured a fresh range of pasture over the same ground as their shorter-necked companions, and on the first scarcity of food were thereby enabled to outlive them. (42)

Wallace explains that there are giraffes with a slighter longer neck, which is just a variety among giraffes. Those with a longer neck have the luck, by chance, that they can survive more likely because they are able to reach more tree leaves when there is a scarcity of them. The characteristic of having a longer neck has nothing to do with wanting to reach higher leaves or wanting actively to adapt to a higher tree.

Evolutionary theories were not new in the Victorian period. Many of the questions on the development of the earth and life on it had been researched for ages already. The answers proposed were often based on theories that might date back as far as classical times. Charles Darwin could elaborate his theory upon work by more recent predecessors like his grandfather Erasmus Darwin, Lamarck, Malthus and Lyell and his contemporary Wallace. Their writings promoted gradual change over long time spans, inheritance and population limits, thus providing Darwin with many of the building blocks for his own theory.

Chapter 3

"The question is," said Alice, "whether you can make words mean different things"

The theory of evolution by Charles Darwin

According to Gillian Beer, science must be preceded by revolution and this revolution must take place not only in the minds of scientists but also in the beliefs of other inhabitants of that same culture if this revolution is to reach its full authority (1). *On the Origin of Species* had an immense consequence for not only science, but also for literature and most importantly for society. It is a great example of an extraordinary work which included much more than the maker knew at the time. In terms of a scientific revolution we can disseminate Charles Darwin's notoriety into these - sometimes conflicting - three areas. Darwin (1809 – 1882) used inherited mythologies, discourses and narrative orders (personifications for example) to sell a new story against the grain of the language available to tell it in. As the theory was established, it proved neither single nor simple. Over the course of history, the theory has had a significant influence in many academic fields.

Darwin's adventure began in 1831, when he was twenty-two years old, when he was hired as a natural philosopher by Captain Robert Fitzroy (1805 – 1865). They leave for a five year journey on board of a ship of the Royal Navy, called the HMS Beagle. This ship sails from the Argentine pampas to the seaside of Patagonia and all the rest of South America before eventually heading to Australia and New Zealand. Darwin's most memorable journey is his stay on the Galápagos Islands. This is a volcanic group of islands somewhere south of the equator and 800 kilometres off the shore of Ecuador. For the first time Darwin noted his idea that one species can develop into another one (Desmond and Moore 237). He developed this idea as the only explanation for the similarity and geographical distribution between distinct and still living animals in South America. This theory would also help him to explain the many different new mockingbird variations he found at the Galápagos Islands. Contrary to his predecessors, Charles Darwin did not just philosophise or

theoretically analyse his ideas, he actually *saw* the development in species. Providing actual proof of an evolutionary theory is considered a revolutionary breakthrough. Continuing his research in London, Darwin became very influenced by Thomas Malthus' *An Essay on the Principle of Population* (1798). Although Darwin was notably influenced by many different theories on evolution, as can be seen in the previous chapter, Malthus has been proven to be the most important. A key point in Darwin's theory of evolution is the element of *the struggle for existence*. In this struggle, all species produce more offspring than available resources (Malthusian catastrophe), but because of the competiveness of life with its climate disasters or natural enemies (Malthus' positive checks), a certain number of one generation will not survive. As he later wrote in his diary:

> In October 1838, that is, fifteen months after I had begun my systematic enquiry, I happened to read for amusement Malthus on *Population*, and being well prepared to appreciate the struggle for existence which everywhere goes on from long-continued observation of the habits of animals and plants, it at once struck me that under these circumstances favourable variations would tend to be preserved, and unfavourable ones to be destroyed. The result of this would be the formation of new species. Here, then, I had at last got a theory by which to work... (Desmond and Moore 318)

When Darwin finally came to this new insight in his theory of natural selection, he was excited to further develop it. In the meantime, he published his travel journeys in *Journal of Researches into the Natural History and Geology of the Countries I Visited During the Voyage of the H.M.S. Beagle* (1839). The book became an immediate success and he was awarded a Royal Medal by the Royal Society for his work so far. At this point in time he already had great success and notoriety within his own work field of natural history scientists.

As can be read in the previous chapter, at this time Alfred Russel Wallace independently discovered natural selection. An essay sent to Darwin by Wallace on 18 June 1858 gave Darwin the final push he needed to publish his own research on

natural selection. Although Wallace's and Darwin's work was simultaneously presented at a meeting of the Linnaean Society of London on the first of July 1858, O*n the Origin of Species* published a year later made a far greater impact. Next to its obvious scientific merit, this impact can be attributed to his use of an understandable vocabulary as well. Darwin's book was widely and thoroughly read by many Victorians at that time. This made Charles Darwin a tremendous influence on the generations which succeeded him. *On the Origin of Species* was also translated into many languages, becoming a staple scientific text attracting thoughtful attention from all walks of life, including the 'working class men'. Darwin's fame expanded from his own circle of scientists and other academics, to the rest of society.

The response of the Church of England was mixed. Over the course of history many theologians, philosophers and natural philosophers developed ideas on evolution. With the studies of geologist Lyell, the proof that the world was actually old enough for Darwin's evolution to have happened in the way he describes it, was already available. It gave rise to Darwin's theory of natural selection which discovered that species could develop over time and were not fixed in form from the beginning. Humans were no longer the centre of the earth and created to rule all other species. Man and ape, were biologically classified as the same: a primate. This notion was the biggest obstacle for the church. In the Biblical book of Genesis all organisms were created by God's word during the six days of creation. The ideal types formed by this special process, including Adam and Eve, were the progenitors of all organisms. The literal interpretation of the Theory of Creation consists of two components. The first component is a set of assertions: species do not change through time; they were created independently of one another, and were only created very recently. The second component indentifies the process that is responsible for producing the pattern, namely separate and independent acts of creation by a designer. A fairly large part of the English clerics therefore dismissed Darwin's ideas, but liberal clergymen - like Charles Kingsley - interpreted natural selection as an instrument of God's design. The most famous confrontation was at the public Oxford Evolution Debate in 1860, during a meeting of the British Association for the

Advancement of Science, where the Bishop of Oxford, Samuel Wilberforce, though not opposed to transmutation of species, argued against Darwin's explanation that humans and apes descended from the same ancestor. Thomas Huxley, one of Darwin's friends and a biologist, argued strongly for Darwin. He was part of the small group with whom Darwin had shared his theory before publication and he wrote a favourable review of *On the Origin of Species* in *The Times* in December 1859. Eyewitnesses and the debaters reported on what happened, with agreement on the broad strokes of the arguments exchanged during the debate. According to science author Bill Bryson, "more than a thousand people crowded into the chamber" (348-349). Thomas Huxley's legendary retort that he would rather be descended from an ape, than a man who misused his gifts to attack science, came to symbolise a triumph of science over religion. Huxley's famous debate in 1860 with Samuel Wilberforce was a key moment in the wider acceptance of evolution and in his own career. Huxley was slow to accept some of Darwin's ideas, such as gradualism, and was undecided about natural selection. It is remarkable that he was wholehearted in his public support of Darwin, as it is the concept of natural selection that is key to Darwin's theory. After this debate Huxley became known as 'Darwin's Bulldog'. Due to his suffering from illness, Darwin was unable to attend the debate himself. In a letter to Joseph Hooker - a famous botanist, and his friend who also spoke in favour of him at the debate - he wrote:

> I had no idea you had this power. I have read lately so many hostile views, that I was beginning to think that perhaps I was wholly in wrong & that Owen was right when he said the whole subject would be forgotten in ten years; but now that I hear that you and Huxley will fight publicly (which I am sure I never could do) I fully believe that our cause will in the long-run, prevail. I am glad I was not in Oxford, for I should have been overwhelmed, with my stomach in its present state. (*Darwin Correspondence Project* letter 2853)

Darwin turned out to be right. As the debate room was packed with people, mostly academics, Darwin's theory was getting a lot of attention. Although the public did

not always agree on natural selection, Darwin and his theory became something to talk about, a hype, the start of a revolution. Despite the lack of initial publicity, the debate has grown to near mythic status as the first face-off between biblical literalism and the growing science of evolution.

The most disturbing question nineteenth-century society faced was what it means to be human. The rapid development of industrialisation, medicine, evolutionary theory and the mental and social sciences challenged the traditional view of people as uniquely privileged beings created in the divine image. Although religion remained a powerful social and ideological force, it became increasingly difficult for educated writers to refer to a *literal* interpretation of the biblical theory of creation, with a supernatural being as the one creator of everything. In the intense debates that evolutionary theory provoked, the consequences for individual identity became immediately apparent. For those who believe people have evolved, the notion of individuality changed (Otis 236).

It was crucial to Darwin to explain the concept of natural selection to his readers, as this was a new addition to the already existing ideas on evolution. In those days, it was common for scientists to persuade their audiences by explaining their theories in a familiar vocabulary with recognisable examples close to their homes. In *On the Origin of Species*, Darwin tried to convince his audience by reminding them how breeders produce new animals. Evoking images from their memories, he encouraged them to construct new ones of events they had never seen. Darwin offered readers large numbers of his own observations, but he knew he would never win many followers for the natural selection hypothesis unless he also succeeded as a narrator, telling readers a story they would accept as real. Victorian writers called on readers' *imaginations*, their ability to understand and accept concepts they could not actually experience themselves, to reveal the ways small changes produced transformations over long periods of time. The challenge was to make readers picture millions of years of gradual change, periods that were and are unimaginable for most. Here, metaphor proved valuable to literary and scientific writers, both of whom thought consciously about the comparisons they were

making. Darwin deliberately made use of personification. Especially with 'Nature' he retains the classical image of the Great Mother (Beer 7). Evolutionary theory is an abstract idea; there is not a force, power or creator who has control over this process. With the use of metaphor Darwin tried to make his ideas more familiar and himself more credible by referring to an ancient, classical idea of nature. It gave readers a sense of relief that there still was something they would recognize since the absence of God or Man in his theories. By making the connection with the classics, Darwin also presents himself as a well-rounded author interested in not only abstract new things but also admiring what once was. Darwinian theory takes up elements from all the orders and particularly from recurrent mythic themes such as transformation and metamorphosis. Darwin's personification of nature as female was of course part of a long tradition. In Ovid's mythical geological account *Metamorphoses* - which geologist Charles Lyell also used in the first chapter of his *Principles of Geology* – Deucalion is instructed to throw behind him the bones of his great mother: "our great mother is the earth, and by her bones I think the oracle means the stones in the body of the earth. It is those we are instructed to throw behind our backs" (39). One must bear in mind that Ovid is a Roman, and thus a late author of the classical period. His *Metamorphoses* serves as basic text for a survey of the mythological traditions of the earlier classical period. The usage of this personification can be found both in contemporary literature and in other scientific writing of the period. There are multiple effects of personifying nature as female but for the purposes of this argument there is one particularly important effect: to distinguish nature from God (Beer 64). Although God is presumably genderless, the deity is often referred to as 'Father' or with the pronoun 'his'. By distinguishing nature from God, by making nature female, Darwin prohibits the idea that God or anyone else has anything to do with natural selecting. This was important to him, as he tries to prevent the notion that his natural selection might be seen as an active agent doing the selecting. Although the personifications presented in *On the Origin of Species* were intended to contribute to engage his readers and contributed to the popularity of the book, these passages were the ones Darwin struggled with the most in his later editions.

Although one of his initial reasons for personification was to keep the emphasis away from the idea of an active creator, the audience sometimes *did* see natural selection as an active force doing the selecting. His theory had no place for an initiating or intervening creator, nor for an initiating or intervening author.

When one reads *On the Origin of Species*, one notices immediately Darwin's emphasis on plants: three out of twenty-five chapters are completely devoted to it. Although Darwin's descriptions of animals are far more detailed than the ones on plants, he absolutely did not have a preference. Because of this, and his published work on botany, Darwin ended the long history of classifying animals above plants which dated back all the way to Aristotle. It is tempting to think of the individual organism as dynamic and the environment as static but the environment, being composed of so many more varied needs than the individual, is accessible to unforeseeable and uncontrollable changes (Peeters 48). Natural selection contradicts the Lamarckian idea that will and habit can generate improvements, because nature can never control all the multiple energies of life. Nature itself is a matrix of possibilities, the outcome of multiple interactions between organisms and within organisms. Darwin avoids any suggestion that the world is now completed and reached its final and highest condition: "while this planet has gone cycling on according to the fixed laws of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved" (415).

The evolutionary process relies on producing offspring, hence Darwin's decision to concentrate on the powers of sexual selection in his *The Descent of Man, and Selection in Relation to Sex* (1871). For Darwin, the physical is prolonged through generations and in the methodology of life production, growth, and decay are all equally needed for the continuance of life on earth (Beer 116). In this work he emphasised the discussion of the ideas of will and culture, which are notably and deliberately excluded in his first work. The internalised values of the community play their part in the process of sexual selection and the bonds between biology and sociology are drawn close (Beer 118). What was the role of women, who physically transmitted the race? Despite Darwin's original thoughts that in civilized nations

women have free or almost free choice in choosing a partner, he feels the Victorian burden throughout *The Descent* to contrast this. It is especially in this field his writings raised problems. Elements in his ideas have been appropriated to serve as confirming metaphors politically at odds with those of Darwin himself, such as social Darwinism, or race theory. The idea that women hold an active power in the selection made for a complex confusion of biological and social determinants in the transmission and in sex roles. As Darwin puts it: "It is generally admitted that with woman the powers of intuition, of rapid perception, and perhaps of imitation, are more strongly marked than in man; but some, at least, of these faculties are characteristic of the lower races, and therefore of a past and lower state of civilization "(*The Descent* 858). Within all species the female most commonly holds the power of selection but in his view among humans the male suddenly dominates the choice. The emphasis on women in the concept of sexual selection opened debate in other areas as well. Topics traditional to the novel as courtship, sensibility, the making of matches, women's beauty, and men's dominance became charged with new difficulty in the wake of the publication of *The Descent of Man*. The intersection of evolutionary theory and psychological and social theory therefore became newly important.

Evolutionary theory also had particular implications for narrative form and for the composition of fiction, because of its preoccupation with time and with change. The theory brings together two imaginative elements implicit in much nineteenth-century thinking and creativity. One was the fascination with growth expressed also in natural philosophy. The other was the concept of transformation. The intellectual interest in fairytale and myth, which increased as the century went on, was fuelled by these preoccupations (Beer 5). The rise of children's literature as the new literary genre gave an extra boost of interest to these subjects, since plot options for this genre were limitless. The extraordinary metamorphosis within the natural life cycle of creatures such as frogs and butterflies, as well as the sustained transformation of baby into adult, had long been the subject of marvel. There is one crucial difference between the idea of metamorphosis and Darwin's theory of natural

selection. The latter required extinction, while Ovid tells us that "all things change, but nothing dies" (339). For Darwin, death was extended from the individual organism to the whole species. The *struggle for existence*, with echoes reminiscing Malthus, is one of the leading ideas in the theory of evolution. Death is an important event due to the competiveness in nature, which is needed to balance out the enormous offspring from different species. Just like many scientists, novelists and philosophers influenced Charles Darwin into creating his theory and presenting it in the way he did, the same is true for literary writers. They were inspired by, and made use of, this new Darwinian phenomenon, which they could extend to a level without limits in their narrative form, as well as in their plots. With the emphasis on growth in popular Victorian fiction and the emphasis on *survival of the fittest* by Darwin, novelists like Lewis Carroll liked to play with these subjects. So Alice grows small again in Wonderland, before finding herself and trying to adapt to her surroundings, varying inconveniently in size according to what she eats and or drinks.

As this thesis builds up to the close reading of *Alice's Adventures in Wonderland* and *Through the Looking-Glass*, it is important that every reader has a full understanding of the theory of evolution to follow my arguments. Therefore, the theory will be explained in a clean and straightforward setting. The chosen layman's approach is in a vocabulary close to Darwin's heart in an attempt to save the audience for "the driest thing [they] know" (Carroll 25). Darwin's theory, as written in *On the Origin of Species*, is based on four empirical observations. The first observation is variation amongst species:

> ...[W]e have many slight differences which may be called individual differences, such are known frequently to appear in the offspring from the same parents, or which may be presumed to have thus arisen, from being frequently observed in the individuals of the same species inhabiting the same locality. No one supposes that all the individuals of the same species are cast in the very same mould. (Darwin 39)

Every individual –within a species- has got slightly different qualities or characteristics than the other one. For example, all humans have a unique fingerprint. Every cow has got a different pattern of black marks on her back, and if you buy a bouquet of roses you will see that every rose slightly differs from the other. There are roses with more thorns or others which are a bit more red.

Darwin's second observation was that all species produce more offspring than beyond available resources. However, only a small amount of that offspring will make it into adulthood because there is simply no space for every infant creature. Therefore the population rate of a species stays the same over the years. Darwin explained that this is due to the *struggle for existence*:

> …Never to forget that every single organic being around us may be said to be striving to the utmost to increase in numbers; that each lives by struggle at some period of its life; that heavy destruction inevitably falls either on the young or old, during each generation or at recurrent intervals. (57)

All animals – including humans - and plants have a very tough, and therefore competitive, life. One may think of climate changes, natural disasters, or natural enemies who act as predators. A certain number of one generation will not survive and eventually dies.

The third observation is a combination of the first two: the variation within a species, combined with the struggle for existence in nature, guarantees that animals and plants who have the ability to adapt a tiny bit better to their environment or situation, eventually will survive. Darwin calls this phenomenon *natural selection*:

> ...can we doubt (remembering that many more individuals are born than can possibly survive) that individuals having any advantage, however slight, over others, would have the best chance of surviving and of procreating their kind? On the other hand, we may feel sure that any variation in the least degree injurious would be rigidly destroyed. This preservation of favourable variations and the rejection of injurious variations I call Natural Selection. (70)

This means that individuals, who possess qualities (a variety) which are disadvantageous for their natural habitat, have a larger chance to die than individuals who can adapt a bit better to nature due to their advantageous qualities. For example: a rabbit which has the quality to run a bit faster than his peers, or a robin who can fly a bit further than his brothers and sisters to collect food, are likely to survive where others without these qualities will not.

The fourth and last observation completing the theory of evolution is inheritance. Darwin saw this principle as a condition for natural selection:

> The laws governing inheritance are quite unknown; no one can say why the same peculiarity in different individuals of the same species, and in individuals of different species, is sometimes inherited and sometimes not so…Naturalists continually refer to external conditions, such as climate, food, &C., as the only possible cause of variation. In one very limited sense, as we shall hereafter see, this may be true; but it is preposterous to attribute to mere external conditions, the structure, for instance, of the woodpecker, with its feet, tail, beak and tongue, so admirably adapted to catch insects under a tree. (3-11)

To understand the above quotation, one needs to look again at the example above, of a bird who owns the quality to fly a bit further than the others in his group. Which robin gets a certain quality is arbitrary, but whichever bird has it is most likely to survive, because he has this 'superior' quality. The bird will make it into adulthood and can produce his own offspring of robins. His 'superior' characteristic is an advantageous quality and will be passed on to the next generation, and the following one, and so on. These special robins will eventually outnumber the other robins that miss this flying characteristic. The population rate needs to stay the same, so the 'superior' robins will survive and the 'normal' robins will die. In the end a new kind of robins will arise: the superior flying robins. With this observation, Darwin had an explanation for qualities of an individual which at first sight do not have a specific purpose.

Males and females often differ strikingly in size, appearance and behaviour. With, what he called, *sexual selection* Darwin could explain that the beautiful coloured feathers of a male peacock are there to attract female peacocks. These feathers differ per peacock and only allow the most attractive peacock to mate and have offspring. He therefore has a quality that his peers do not have, which gives him an advantage over the others. In his *The Descent of Man, and Selection in Relation to Sex* (1871), Darwin describes how in humans, our differences exceed the obvious essential ones in genitalia and reproductive organs. They are found in the appearance of our faces, the sound of our voices, the distribution of our body fat and body hair and our size in general. He realised that individuals vary not only in their success at surviving and reproducing, but also in their success at persuading members of the opposite sex to mate with them. About birds, for example, Darwin wrote:

> Inasmuch as the act of courtship appears to be with many birds a prolonged and tedious affair, so it occasionally happens that certain males and females do not succeed during the proper season, in exciting each other's love and consequently do not pair (107).

In its evolutionary consequences, failing to mate is the same as dying young. The victim makes no genetic contribution to future generations. Darwin had already applied the label *natural selection* to differential reproductive success, due to variation among individuals in survival and reproduction. Differential reproductive success due to variation among individuals at getting mates, he called *sexual selection* (Freeman and Herron 402). If there is heritable variation in a trait that affects the ability to obtain mates, the variants conducive to success will become more common over time.

Instead of fixed and perfect species, the theory of Charles Darwin shows forms in flux, and the earth in constant motion (Beer 127). It is a theory which does not privilege the present, which sees it as a moving instant in an endless process of change. Yet it has persistently been recast to make it seem that all the past has been yearning towards the present moment. Although much has been based upon coincidental factors, Darwin brings them down to four empirical observations which

seem to fit all forms of life. This mechanism of inheritance will make sure that over time, a species can slowly change, or in Darwin's own words: "A naturalist might come to the conclusion that each species had not been independently created, but had descended, like varieties, from other species" (2).

Nowadays Darwin is still the first scientist to be mentioned in one sentence with evolution. His appreciation, understanding, and the proof of the means through which change, development, and extinction took place in reality were to revolutionise our understanding of natural order. Darwin had a willingness to experiment and to observe deviations, against the habits of his society, his faith, and even against his own inclination which made him the heart of Victorian creativity. As Darwin modestly puts it: "I think that I am superior to the common run of man in noticing things that easily escape attention, and observing them carefully" (Autobiography 55).

Chapter 4

"Would you tell me, please, which way I ought to go from here?"

Children's literature and the use of evolutionary theory

The soil had been ready as early as 1830 for the development of imaginative writing for children, but nothing really happened which made a lasting impact on children's literature in Britain during the first half of the nineteenth century (Carpenter 19). Before anything of value for children could develop, individual authors would have to feel themselves driven away from an adult audience to a child readership. In the years before 1860 the middle-class Englishman had never had it so good. The Great Exhibition of 1851 was a celebration of Britain's position as a leader of industrial society and an enormous growth in the national economy was underway. Yet in the middle of this prosperity, a lone voice was beginning to develop. Its message was that the public world was intolerant, and that a man of vision, a true artist, must alienate himself from society to pursue his own private dream (Carpenter 10–11). There was a realisation that the Industrial Revolution not only brought England riches, it also had produced a widespread misery for the working class. The growing awareness about these conditions inspired many writers, and directly influenced children's literature. Charles Kingsley was inspired to write *The Water-Babies* after reading about the conditions of working class children and child labour. Charles Dickens had started publishing his *Oliver Twist* as early as 1837 in which he also addresses the harsh lives of workhouse orphans. From then on, there became more of a need for 'fantasy' stories, involving impossible things or magical events. It was a climate which must have encouraged people to turn inwards, to obtain from children the sense of security and stability which the outside world was not providing. The Romantic thought, heavily influenced by William Blake and William Wordsworth, that a child may be the purest form of a human being was still very active in the Victorian period. Because of its age, a child was imagined to be less influenced by the rough, compromised adult life with all its challenges and is therefore closer to God,

the revelation of the true nature of self. In these decades, growing up becomes synonymous with the loss of paradise. As an adult we can no longer see the world in its purest form with all its magic. This new shift in perspective on childhood was an important marker for why so many classic children's novels were written during the Victorian Period. Until now children were mostly seen as miniature adults, who needed to be educated in morality and made aware of their inborn sinfulness. They did not have specific books that were adapted to their world and imagination. The idea of a pure and angelic infant is considered to indicate the development of the distinctiveness of literature for children as a form: a new genre. The conception of the author as a possessor of particular kinds of knowledge and the higher form of imagination, suggests that writing for children provided valuable insights into the changing concept of authorship. All literature is based on the power between author and reader, and is dependent on a shared level of understanding in language (Thacker 4). Children's literature is heavily burdened by the latter and it is very important that the author, as well as the narrator, acknowledges the young reader's learning curve. With the Romanticism in mind, one can conclude that a child is finally taken seriously and even seen as a higher form of human being. This lead to authors not only acknowledging the child's level of learning the language, but more important having much more faith in the child itself for understanding the authors plotline. The imaginative qualities of a child made the author feel he could write a multilayered text, where the reader could interpret the story on its own instead of having a strict authoritative narrator who knows best. The child reader becomes an ideal reader: one who will understand the higher form of imagination, which offers the sense of a secret between author and child. The growing discomfort in the relationship of author and reader thus lead to a position of confidence for the author in his ability to provide an alternative world. These shifts inevitably found place in adult literature as well, but it is more noticeable or more obvious in children's novels. By tracing the development of children's literature it is possible to see the connection between the shifting of power in any text (Thacker 4). The number of enduring works written in this time like *Alice's Adventures in Wonderland* and *Through the*

Looking-Glass, as well as, *The Water-Babies* are defined by their narrative approach which seems to speak directly to their child reader.

Literature in general offers rich opportunities to analyse the relationship between identity and *transformation*, but the Golden Age of Children's Literature, as the period is often called, offers not only an inside in the mind of Victorian children but an inside into what concerned adult Victorians. The average Victorian had to redefine one's identity as questions were raised on humans and animals, time, race and gender. The new genre of children's literature became therefore the perfect medium to release the author's adult anxieties of the time. The sense of loss which can often be found in nineteenth-century literature was also very strongly influenced by new scientific discourse. The impact of Darwinian thinking cast a doubt on the religious beginnings of human descent. Time and change were two words which obtained new meaning and had an effect on narrative form (Beer 97). Over thousands of years, gradual changes took place in nature. Both Because of Lyell's theory of uniformitarism a fall, into a rabbit hole for example, could be slowed down to the extreme (as mentioned in Chapter 2) while in a short time span, a lot of different adventures could happen. Alice's afternoon dream incorporates all her adventures in *Wonderland* and lasts an entire novel long. As the century went on, intellectual interest in fairytales, folktales and myths was being fuelled by – again - the theory of evolution. In fact, Darwin's theory of evolution is quite a fairytale itself. It touches mainly upon two concepts: transformation and growth which were, according to Gillian Beer, very much a part of nineteenth-century thinking and creativity (117). The metamorphoses of caterpillars into butterflies and tadpoles into frogs raised questions if they were valid examples of species mutation. One can imagine that the transformation of the innocent baby into adulthood sparked even more to the Victorian's imagination. We have all grown inside the womb of our mothers and from there grew from babyhood into adulthood. This is quite an invisible process, as is evolution; one can only notice it in retrospect. This sense of loss is recognisable for many: aging makes one yearn for childhood days but with the consciousness of an adult present in that moment. Whilst still believing in the innate goodness of a child,

Darwinian thought and the realisations that is suggested encouraged adults to look towards childhood as the key to their own self awareness. Darwin's evolutionary ideas were based on birds, butterflies, beetles and other often miniature animals he studied at the Galápagos Islands. He researched these animals without any technological instrument but rather through his observation with his own eyes. This must be the reason why dodos, sea creatures, and for example shellfish appear in the *Alice* books and many children's fantasy books of the period. Children's literature proved to be fertile ground for evolutionary theory, as both types of literature require the reader to accept certain truths that might not seem logical or tangible at first.

The Water-Babies has already been mentioned in the previous chapters. The novel was published in 1863, four years after the appearance of *On the Origin of Species*, and it is probably one of the most celebrated Victorian fantasies for children. Unfortunately for the author, Charles Kingsley, its success was outshone by the publication of *Alice's Adventures in Wonderland* in 1865. Nevertheless, it is a great, perhaps even the first, novel written specifically for children which incorporates the zeitgeist perfectly. *The Water-Babies* centres around Tom, a young chimney sweeper who accidentally falls down, covered in soot, into the bedroom of a girl named Ellie. While she is still asleep, he catches a glimpse of his own reflection in the mirror and scarily discovers that he is but "a little black ape" (Kingsley 12). A couple of pages later Tom is referred to as "a small black gorilla fleeing in the forest" and slowly the Darwinian subtext weaves itself into the main text (14). The little girl awakes, screaming, and the entire household is then sent out to catch the alleged burglar. Tom makes a narrow escape through the fields and falls down a cliff into a stream where he is believed to have drowned. This is where the evolutionary adventure begins, as Tom has now become a water baby, a reverted embryo version of himself. His trials include all kinds of Darwinian creatures, all under the close supervision of two very unusual fairies: Mrs. Bedonebyasyoudid, acting for law, and Mrs. Doasyouwouldbedoneby, acting for love. *The Water-Babies* is a great example of a Darwinian fairytale. It is a children's novel heavily inspired by evolutionary theories,

where facts and fictions mingle and where fictional characters and famous scientists coexist.

Kingsley plays with the Victorian intertwining of art and science mentioned in the first chapter. He proves to be a well-educated artist by mentioning Charles Darwin in a key passage in his novel. In doing so, he justifies the existence of a (fictional) strange species, namely that of a water baby. Therefore, he can present his story as if it were a scientific demonstration proving the existence of a water baby, balancing the line between fiction and fantasy:

> You must not say that this cannot be, or that that is contrary to nature. You do not know what Nature is, or what she can do; and nobody knows; not even Sir Roderick Murchison, or Professor Owen, or Professor Sedgwick, or Professor Huxley, or Mr. Darwin, or Professor Faraday, or Mr. Grove, or any other of the great men whom good boys are taught to respect. They are very wise men; and you must listen respectfully to all they say: but even if they should say, which I am sure they never would, "That cannot exist. That is contrary to nature," you must wait a little, and see; for perhaps even they may be wrong. (31)

Kingsley also mentions other important men who contributed to science and evolution as a whole, to invigorate his argument. Although Darwin and Kingsley both went to Cambridge, their periods of study did not overlap. Their careers on the other hand grew simultaneously: Darwin published his research in 1859 while the next year Kingsley, a historian, was appointed professor in history which was one of the most distinguished positions in Cambridge. Although Kingsley was a celebrated academic, he was primarily known as a Christian apologist and eventually became appointed chaplain in ordinary to Queen Victoria in 1859. He was reunited with Darwin through the debate on evolution and even exchanged a few letters with him on the subject. On 18 November 1859, just a few days before the publication of *On the Origin of Species*, Kingsley admitted that he no longer believes in the existence of fixed species and offered to support Darwin in his letter:

> That the Naturalist whom, of all naturalists living, I most wish to know & to learn from, should have sent a socialist like me his book, encourages me at least to observe more carefully, & think more slowly. All I have seen of it *awes* me; both with the heap of facts, & the prestige of your name, & also with the clear intuition that if you be right, I must give up much that I have believed and written. (*Darwin Correspondence Project* letter 2534)

Kingsley did not see the theory of evolution as an obstacle to his faith. He rather found a way to unite the two by believing that God did not just make the world, he made something much more wonderful, God made the world that could make itself (Chassagnol 3). Kingsley illustrates his new ideas on evolution by adapting Darwin's ideas into his novel and creating a protagonist, Tom, who changes into a creature halfway between humanity and animality.

The Water–Babies follows Darwin's observations for his evolutionary theory very accurately. Kingsley uses variation, natural selection and inheritance to create his fantastical saga. When Tom wakes up, he finds himself under water and is no longer a boy but an embryo of some sort, which has adapted to its new environment by developing gills, just like a fish. A parody on adaptation can also be found in the episode of the salmon and the trout. Tom comes across both fish, where the salmon confesses how much he despises the trout:

> "My dear, we do not even mention them, if we can help it; for I am sorry to say they are relations of ours who do us no credit. A great many years ago they were just like us: but they were so lazy, and cowardly, and greedy, that instead of going down to the sea every year to see the world and grow strong and fat, they chose to stay and poke about in the little streams and eat worms and grubs; and they are very properly punished for it; for they have grown ugly and brown and spotted and small; and actually so degraded in their tastes, that they will eat our children." (Kingsley 55)

This quotation is, of course, mainly a moral instruction and Kingsley's Christian persuasion is taking the lead here. While in Darwin's terms adaptation is based on a coincidence, having the right characteristics to survive a certain environment, Kingsley uses the term *adaption* in a deliberate way. He illustrates this with one of the seven deadly sins, namely sloth or in this case a form of sloth: laziness. Because the trout has been lazy for far too long he has adapted to the little streams he lives in and became ugly, scary, and monstrous, threatening it would eat children. While the salmon that goes down to the beautiful open sea every year has remained the same in appearance as well as in character.

At the beginning of the novel when Tom has not yet been transformed into a water baby, Kingsley combines Darwin's observation of inheritance with the struggle for existence. As Tom is rolling down a hill, he encounters a beetle. Tom who just fell down the chimney into Ellie's room is covered in soot and makes all things "dirty everything, terribly as he went" (21). As a result, Tom smudges the beetle as well, who will be affected for generations:

> And there have been more black beetles in Vendale since than ever were known before; all, of course, owing to Tom's having blacked the original papa of them all, just as he was setting off to be married, with a sky-blue coat and scarlet leggings, as smart as a gardener's dog with the polyanthus in his mouth. (21)

The coincidence with which this quotation is paired is also very much a Darwinian idea but is played around with to the extreme. If Tom had not fallen through a chimney, fleeing for the owners, and had never met that beetle, then all beetles still would have been light blue.

Although Kingsley fully supported Charles Darwin and his theory, one cannot deny when reading *The Water-Babies* that Kingsley very much wants to demonstrate that humans and animals have indeed descended from the same species but are nevertheless very different. Kingsley does so by infusing his Christian morality into the novel, for example with the trout and salmon part mentioned above. He also uses the human linguistic skills as an important argument for setting humans and animals

even further apart. In chapter VII, language is used to symbolise decay when Tom is confronted with Lady Gairfowl. She is unable to fly because her wings have shrunk to such an extent she can only use them to fan herself. Because she is the last of her species, and is soon dying out, she is degenerating, or transforming backwards. The Lady has not only physically deteriorated, but also her ability to talk and understand language is affected. Language is, of course, an important characteristic when describing the difference between animals and humans. Although some animals have a communication system, the ability to understand one another in the same *and* even in a different language is exclusively a human trait. This is an especially interesting part of the story, because it shows that Kingsley is well aware that – because of humans - evolution sometimes takes place much faster than nature would naturally do. Tom later discovers that the species to which Lady Gairfowl belongs once was citizen to:

> a great nation, and spread over all the Northern Isles. But men shot us so, and knocked us on the head, and took our eggs – why, if you will believe it, they say that on the coast of Labrador the sailors used to lay a plank from the rock on board the thing called their ship, and drive us along the plank by hundreds, till we tumble down into the ship's waist in heaps; and then, I suppose, they ate us, the nasty fellows! (109–110)

The sailors have the ability to make an entire species vanish, by killing them for pleasure or for food. The birds are unable to adapt to this (unnatural) struggle for existence and then became extinct.

I have mentioned earlier that concepts of time have influenced the Victorian narrative form and this is also the case in *The Water-Babies*. One does not actually know how long Tom has been away on his quest to evolve into a better person than he once was. He manages to drown, die, wake up again, and be transformed into a water baby who will eventually grow up "a great man of science, who can plan railroads, and steam engines, and electric telegraphs" (148). Although the notion of time was mainly driven by Lyell's geological research, Darwin who uses Lyell's theories was the main influence on Charles Kingsley's novel. By the end of the book

Tom is indeed a clean, obedient, and a good Christian and with that Kingsley's demonstration is complete. He fully supports Darwin in the debate on evolution and there are numerous examples of it in *The Water-Babies*, but he also makes sure to mention that as a human species we are superior to other animals primarily because we have the ability to reinvent ourselves by adapting Christian moral qualities.

Chapter 5

"For, you see, so many out-of-the-way things had happened lately"

Lewis Carroll as a writer on evolution

Before pointing out all the evolutionary riddles and references of the *Alice* books, we need to look at the life of the author for clues and perhaps evidence which leads to the conclusion that he was a writer who employed evolutionary motifs and themes. A biographical reframing can help to understand the meaning of his dream texts. Lewis Carroll was born in 1832 into a rural parsonage in Daresbury, Cheshire. He was the third of eleven children and the eldest son of the family. His father was a High Churchman, and a graduate of Christ Church, Oxford, just like Carroll himself. Though Carroll rarely mentions him in his diaries and letters, his father and Christ Church were to cast a long shadow over his entire life (Haughton xv). The first eleven years of Carroll were spent in this crowded rural parsonage, dominated by his father's strong intellectual personality with rituals of Anglican piety but also with many family games en stories. His nephew Stuart Dodgson Collingwood who published *The Life and Letters of Lewis Carroll* in the year of his death in 1898, mentions that Carroll lived his first years in "complete seclusion from the world" being educated at home by his mother – of whom we know little about - and subjected to a heavy dose of Christianity from his father (11). Carroll's imagination blossomed in those days, numbering snails and toads among his intimate friends. In *Alice's Adventures in Wonderland* and *Through the Looking-Glass, And What Alice Found There*, the animals and surroundings he described so vividly owe their origin to his time in Daresbury (Cohen 5). Eventually the family would move into a less secluded and larger parish in North Yorkshire close to the newly built railway and industrial Darlington. The children seemed to thrive in this rectory but they still remained a very close knit family throughout their lives. One of the odder shared characteristics of the Dodgson children was a chronic stammer; Carroll suffered from this his entire life. Curiously, his stammer disappeared when he talked to children, suggesting he

might feel more at ease in their company. The dodo of *Wonderland* represents the first syllables of his stammered surname "Do-Do-Dodgson" (Haughton xvi). Besides the possibility that Carroll is likely making fun of himself here – the Dodo is a very uptight character - it is also, of course, a reference to the extinct species. Although there is some controversy about the exact year the dodo became extinct, it must have been in the late seventeenth century. The dodo, endemic to the island of Mauritius, is a classic example of Darwin's principles: due to the long absence of predators, natural selection made sure that over time its wings became too short to fly. This became an advantageous characteristic which was passed on to their offspring. With the arrival of humans, the dodo gained a new natural enemy, to whom it could not adapt in due time.

In 1844 Carroll's school education began when he was sent to Richmond boarding school and then two years later to Rugby, a public school. At both schools he was very unhappy being far from home and in the public system: "'I cannot say I look back on my life at a Public School with any sensations of pleasure, or that any earthly considerations would induce me to go through my three years again.'" (qtd. in Collingwood 30). Although he found school uncongenial, he was top of his class in almost every subject and followed his father's footsteps in 1851 by taking up residence at Christ Church, Oxford. He studied the classics and mathematics and received a fellowship for life, with the expectation of making a career in church. At the time church Dons were not allowed to marry. One could speculate this would be an attractive part of the job for him: given Carroll's obsession with youth, he might have seen marriage as a symbol of growing up. Carroll was eventually ordained in 1861, but did not follow in his father's footsteps by taking orders and starting a parish and a family of his own. He would remain alone at Christ Church the rest of his life.

Although his childhood was over, nonetheless childhood always played an important role in his life. He cultivated the idea of childhood and especially enjoyed the company of little girls. In his third year in Oxford, and after the death of his mother, Carroll wrote "Solitude" in which he evoked a child crying itself to sleep:

Here may the silent tears I weep
Lull the vexed spirit into rest,
As infants sob themselves to sleep
Upon a mother's breast…

I'd give all wealth that years have piled,
The slow result of Life's decay,
To be once more a little child
For one bright summer-day. (Carroll, The Complete Works of 958)

Carroll's ideal picture of life here is that of being a child, "I'd give all wealth that years have piled…To be once more a little child", and then especially being a child with the benefit of all the knowledge and experiences that an adult would have accumulated. During his life he had many "friendships" with little girls, among which his relation to Alice Liddell, daughter of the Dean of Christ Church was the most influential one. The Liddell children first entered Carroll's life a year after their father - Henry Liddell - was appointed Dean of Christ Church. At first Carroll took only their photographs but was later allowed to take the children on little trips, for example on boat trips on hot summers days where he would tell the children fantastical stories which eventually would lead up to his *Alice* novels. Carroll had a lively correspondence with all of them, but in hindsight seems inappropriate. Those friendships were of course unequal on many different levels: there was an intellectual and emotional distance to overcome. He seemed to have an unhealthy attachment to younger children and at some point Alice Liddell's mother had forbidden him to ever see her children again (Bakewell 129). It is unfortunate that the diary volumes from April 1858 to May 1862, in which Carroll could have written about his developing relationship with Alice, have gone missing or (more likely) have been destroyed. The nature of Carroll's love for Alice remains a subject of speculation based on the evidence of the surviving diaries and letters: "A girl of about twelve is my ideal beauty of form, and one hardly sees why the lovely forms of girls should ever be covered up" (Carroll, *Letters* 1: 83). For this research, this specific part of his life – whether or not he might have pedophile interests, is of lesser

importance. It is still worth mentioning because in the light of this thesis, one can conclude that Carroll was occupied and interested with the *transformation* a human undergoes within a single life cycle. In May 1865, after having seen fairly very little of her, he writes in his diary: "Alice seems changed a good deal, and hardly for the better – probably going through the usual awkward stage of transition" (Carroll, The Diaries of 1: 230). What he meant was probably that Alice was in the period of early puberty in which her child body showed some signs of entering womanhood.

One of the great ironies in his life was that by the time *Alice's Adventures in Wonderland* had been published in 1865, making the fictional Alice the most famous seven-year-old girl in history, and Carroll the most famous children's author in the world, their relationship was a thing of the past and Carroll was banned from the Deanery.

When writing for children, one has to take into account that the reading abilities of the audience is in a state of evolution. Small children might need the help of an adult when reading, while older children might already be able to comprehend more complex storylines and jokes. It is therefore of importance to address the reader on multiple levels. This is something Carroll understood well. For example in the *Alice* books, he uses many polysyllabic words like "antipathies" (Carroll 11). If a child is drawn into the storyline, it is easily provoked to ask questions about difficult words or concepts, and can ask an adult or dictionary for help. Carroll is also a master of making jokes on words, and can layer the meaning of that word pun as well. When in the beginning of chapter 3 of *Wonderland* Alice comes out of "the pool of tears" completely soaked, the mouse decides to tell a story about William the Conqueror, because "This is the driest thing I know" (25). The multiple meanings of the word dry are something a child only recognizes with the years, after re-reading the text. The child has then entered a different level of the book and can share an intimate joke with Carroll. Just like Darwin, Carroll used familiar words to describe something rather new or different. He especially proves to be evolutionary with making up entirely new words which consist of two existing words. For example in *Through the Looking-Glass*, Humpty Dumpty explains to Alice what "slithy" means in

the poem 'Jabberwocky': ""Well 'slithy' means 'lithe and slimy.' 'Lithe' is the same as 'active.' You see it's like a portmanteau -- there are two meanings packed up into one word." " (187). At the time of writing a "portmanteau" was known as a travel bag which could open into *two* equal parts (OED). Since Carroll's use of portmanteau as a word which in fact contains two words altogether, the Oxford English Dictionary and mainstream dictionaries also list Carroll's version as the second meaning of the word. By endowing the strange creatures of the *Alice* books with language, and the ability to create it, Carroll makes an allusion to his friend and philologist Max Müller. Müller was keen to distinguish humans from animals, arguing that the use of language sets them apart. He therefore went against Darwin's theory that language emerged from animal cries. Besides the portmanteaus Carroll excelled in creating words, often names of things or creatures which sound just as they look like. It is inherent that words make sounds and that a sound also is an important part of a word, just like a piece of music is without lyrics. The specific meaning of an instrumental musical piece is not always very obvious, but the emotion of it is often felt clearly. A good example is the "Bandersnatch" which is a mysterious creature from the Jabberwocky poem, but later returns in *Through the Looking-Glass*, referring to all things quick. When the White King explains to Alice he is "good enough "to fight for the crown "only I'm not strong enough. You see, the minute goes by so fearfully quick. You might as well try to stop a Bandersnatch" (198). The king implies that it must be a swift beast. The sound of the word "Bandersnatch" helps us to associate with Alice's adventures: when said out loud snatch sounds snippy if quickly said. According to Morton N. Cohen in his *Lewis Carroll a Biography*, the provoking of feelings in the reader by using the sound of words, rather than the meaning, emerged as a totally new phenomenon in children's books thanks to Lewis Carroll and his evolutionary writing (143). Carroll very well appreciated what it was like to be a child in a Victorian grown-up society. He knew that when reality becomes unbearable, as he experienced at school, the child can seek escape through fantasy. In real life, as well as in the books Carroll treats children as his equals. Throughout Carroll's work, the theme of children overcoming their own youth is

fairly visible. The encouragement of a fantasy world for the struggling children combines very well with the struggle for existence which is so very much present in the late Victorian period.

Carroll's evolutionary thinking in the broad sense of the word meant that he was also very devoted to technological progress. He had an eye for beauty around him but was very limited in his ability to draw. He thought however that photography could be an opening to succeed into the world of art. Photography became a very popular pastime in the 1850's. In 1856, when Carroll was 24, his friend and fellow student at Christ Church Reginald Southey, who was already absorbed in photography, helped to develop his photographic skills. In Carroll's diary listed at 17 March 1856, one can read that he called Southey in the morning and "agreed to go together tomorrow and buy a photographic apparatus" (Carroll, The Diaries of 1: 81). Carroll's favourite objects to photograph were, again, little girls. With taking a picture Carroll could pause the evolution which eventually would change a girl into a woman. In a picture, a girl could remain Carroll's ideal children's age forever. Amongst the highly debatable photographs taken of these children, he also took many pictures of subjects concerning natural history. We can read in his diary on 26 May 1857, that Doctor Ackland called and took him to see the skeleton of a tunny fish in the anatomy department because he wanted Carroll to photograph it (1: 111). This resulted in a collection of anatomical photographs where one notably stands out from the others. In the photograph depicted in Fig. 1, Southey is standing next to several human and ape skeletons.

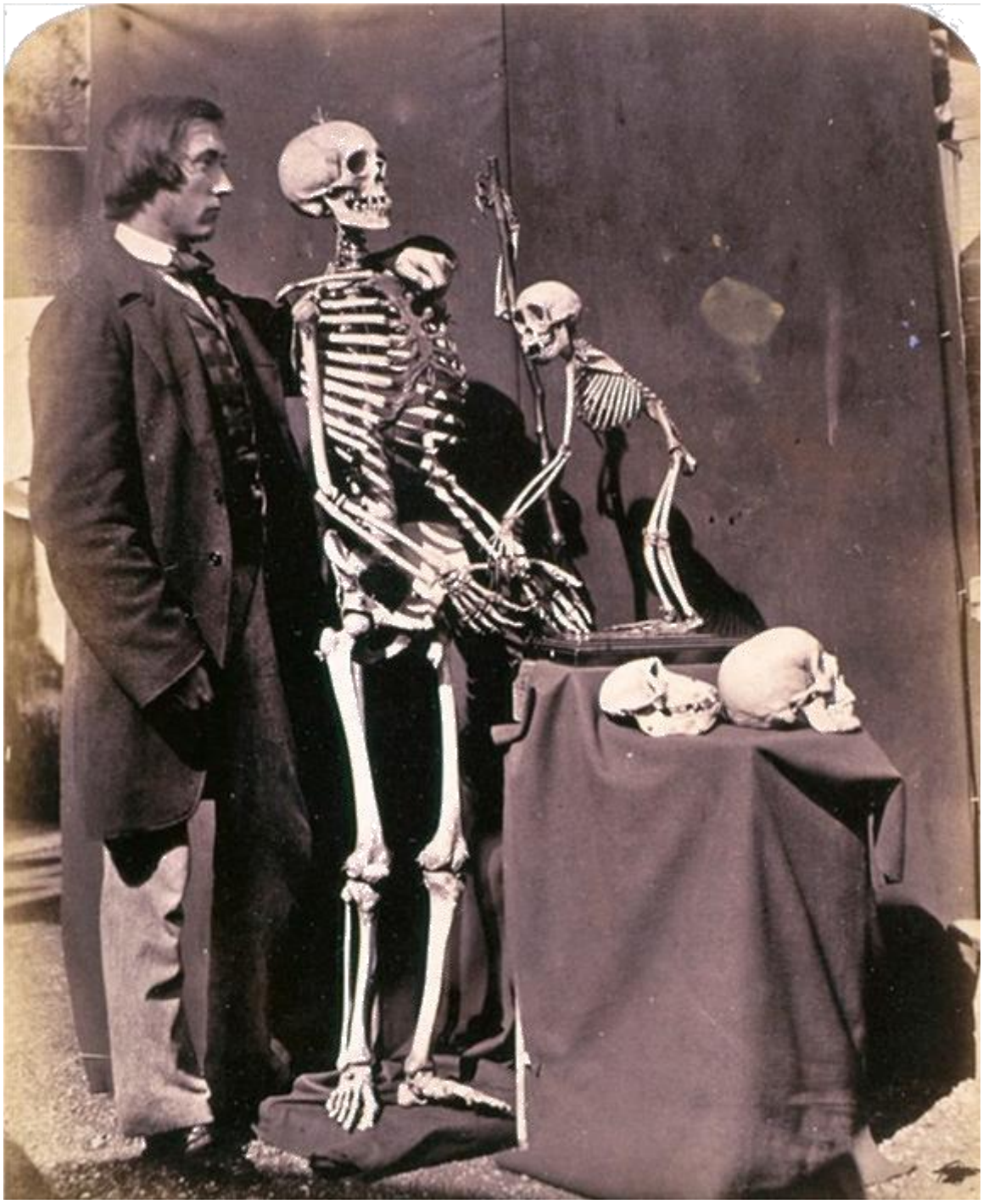

Fig. 1. *Reginald Southey and Skeletons* (Christ Church, Oxford, 1857)

Although the photograph was taken two years before the publication of *on The Origin of Species* in 1859, and three years before the fierce debate on evolution held in Oxford in 1860, I have proven in the previous chapters that evolutionary theory was not entirely new. The descent of species and humans has been a subject for centuries

within religion, natural history and philosophy. Carroll's photograph shows that the kinship between humans and other animals was already a subject of his interest in 1857, especially since we have come to known that Lewis Carroll was a well rounded educated man. In the picture we can see how Carroll carefully staged his photograph by putting his friend Southey first, then a skeleton of human followed by a primate skeleton on the right. It can be seen as an image which shows us the closeness and resemblance between humans and apes, but it also takes you on a chronological journey of humans as a species, a photographical evolution.

We cannot be absolutely certain that Lewis Carroll attended the 1860 meeting of the British Association in University Museum of Oxford, but he probably did. Being a lecturer at Oxford, it was not very likely that Carroll would miss such an important event at his own university. According to Cohen's biography, Carroll served on the reception committee for the men of science from foreign countries and distant parts of the United Kingdom (350). Carroll also took the opportunity to make studio photographs of both Samuel Wilberforce, the Bishop of Oxford, and T.H. Huxley who debated against each other at the event, and over the following days he managed to photograph a number of participants in the meeting (Beer, Alice in Space 141). Unfortunately the diaries for the years 1859 – 1862 are lost but it is clear that the young Carroll was equally aware of the conversations around him in Oxford. In this context it is useful to mention that some years after the publication of the *Alice* books Carroll became a strong anti-vivisectionist which he made clear in the published article "Some popular fallacies about vivisection" in the *Fortnightly* in 1875. In this piece he suggests that animal experimentation will eventually lead to experimentation on humans, and that training and teaching young scientist to ignore feelings, will put us all at risk. The outcome will create a powerful human being without moral responsibility (Beer *Alice in Space* 141). It appears that Carroll makes no real distinction between animals and humans, thus opposing the views of the church. This can be interpreted as evolutionary thinking on Carroll's part, as this dictates that both humans and animals stem from the same beginnings. Nowadays we often judge physicians because of their distance towards patients, forgetting that

their object of research is in fact a human being. Carroll predicted in an early stage that science would take this route.

By the look of Carroll's personal book collection one can conclude that he was very much interested in Charles Darwin and his ideas because no fewer than nineteen volumes of work by Darwin and his critics were found in Carroll's library (Beer 3). We know that they had a short correspondence although only one single entry, dated 26 December 1872, can be found in Carroll's surviving diary which contains the name of Darwin: "thirdly Mr. C. Darwin whose book on the Expression of the Emotions in Man and Animals [1872] I am reading, and to whom I have given a print of 'No lessons today' " (Carroll, The Diaries of 2: 315-316). Although we cannot find Carroll's letter to Darwin, he probably suggested that if Darwin ever planned to publish further work on human expressions he would be very happy to supply appropriate photographs as illustrations. One can trace back Carroll's intentions in more detail by studying the University of Cambridge's *Darwin Correspondence Project*, in which we can find his replies on 10 December and 14 December 1872. Darwin was very happy to have the photograph Carroll sent and liked to "possess it, although I am doubtful whether I shall ever make any actual use of it" (Letter 8668). According to Darwin, his declining Carroll's offer was not for a lack of quality, but was rather due to poor timing:

> I thank you most sincerely for the excellent photograph & your very kind note. I am now employed on another subject & do not think that I shall continue my observations on expression; but I will not forget your obliging offer, should occasion occur. (Letter 8680A)

From these bits and pieces of correspondence we can only conclude that Carroll was indeed interested in Darwin's theories, otherwise he would not have been willing to associate his work with Darwin's. This is why the evolutionary aspect of the *Alice* books should be considered by anyone looking to gain a full and thorough understanding of this work.

Chapter 6

"Begin at the beginning, and go on till you come to the end"

A close reading of the *Alice* books

As the previous chapters have shown, it was very likely that Lewis Carroll was familiar with Darwin's evolutionary theory and was highly interested in topics concerning evolutionary theory in general. Unlike Darwin, Carroll was engaged with his particular preoccupation with human behaviour in society, and has recast Darwin's ideas in a variety of ways as we have seen. Alice's identity problems gain new dimensions when knowledge of the natural history context is brought into the discussion. One can find a Darwinian influence throughout the *Alice* books, many revolving around the themes of time and classification.

At the end of chapter 5 "Advice from a Caterpillar", Alice nibbles for the second time from the mushroom which causes her neck to grow to such an extent that she can bend it "about easily in any direction, like a serpent" (47). When Alice "succeeded in curving [her neck] down into a graceful zigzag" she dives into the leaves and finds herself being on top of a tree (47). Almost immediately she is attacked by an angry mother pigeon, who thinks Alice is a serpent looking to rob her nest of its eggs:

> "Serpent!" screamed the Pigeon. "I'm *not* a serpent!" said Alice indignantly…"I've tried every way, but nothing seems to suit them!"…"I've tried the roots of trees, and I've tried banks, and I've tried hedges," the Pigeon went on, without attending to her; "but those serpents! There's no pleasing them!"Alice was more and more puzzled, but she thought there was no use in saying anything more till the Pigeon had finished. (Carroll 47)

Because the Pigeon is observing Alice, as we humans normally observe animals, the Pigeon immediately tries to classify Alice by not asking *who* she is, but *what* she is:

> "As if it wasn't trouble enough hatching the eggs," said the Pigeon; "but I must be on the look-out for serpents, night and day! ..."But I'm *not* a serpent, I tell you!" said Alice. "I'm a -- I'm a ----" "Well! *What* are you?" said the Pigeon. (48)

The Pigeon specifically wants to know to which branch of species Alice actually belongs. That her name is Alice, that she is a middle class child who likes her cat Dinah, are human answers with which she is not satisfied: "what does it matter to me whether you're a little girl or a serpent?" (48). Humans and serpents both eat eggs, the Pigeon knows, and therefore both of them are a threat to her. In terms of classification Alice is on the same level as a serpent. Alice comes back into her own self by responding that it matters a good deal to her. She is reassuring her identity: she is *not* an animal because she does not "like [the eggs] raw" (48). As Rose Lovell-Smith persuasively argues, Carroll's reversal of the usual direction of the natural history gaze insinuates that humans may not be superior to nature but are merely animals themselves (28). In *Wonderland*, where humans are clearly classified as animals, all according with Darwin's principles, the struggle for existence becomes a real threat to Alice. In the Pigeon scene 'to eat or be eaten' becomes literal: the Pigeon knows she has to drive Alice away by picking her aggressively or otherwise her little ones will not survive. Carroll's choice of a pigeon over any other bird might not be arbitrary: the pigeon as a species can be considered a Darwinian bird, as the Victorian era was the period the last breeding pairs of wild Passenger pigeons vanished, following the dodo into extinction (Lovell-Smith 41). Also Darwin devoted a considerable amount of text to the domestic pigeon in his first chapter "Variation under Domestication":

> Great as the differences are between the breeds of pigeons, I am fully convinced that the common opinion of naturalists is correct, namely, that all have descended from the rock-pigeon (*Columba livia*), including under this term several geographical races or sub-species, which differ from each other in the most trifling respects. (Darwin 19)

The changes in Alice's body and her being able to adapt more to her surroundings strongly evokes the idea of natural selection and thus evolution over time, or in this case over the entire novel. The egg can also be seen as a symbol of evolution, as the content of the egg is also in the process of change: it is transforming into a bird. The image of the egg returns once more in *Through the Looking-Glass* where it is projected as an abstract and solitary object. The egg eventually sets the tone for the next chapter (chapter 6) in which the egg is revealed to be Humpty Dumpty. Although the animals in Wonderland, and with that also the Pigeon, are fantastical version of real animals, the images evoked in this scene echo how Victorians observed, described, and treated animals.

Many Victorians were confused about what it actually meant to be human, since the publication of Darwin's work brought his and earlier evolutionary theory so close to home. When classificatory boundaries shift, move, merge or even disappear – humans are animals, but not all animals are humans - it shakes up personal identity. Carroll refers to this in the Fawn scene in *Through the Looking-Glass*. At the end of the "Looking-Glass Insects" chapter, Alice walks through a darker kind of forest than she has ever done before. When in the beginning of that chapter she is listening to the overclassifying of insects, she now finds herself in the nameless wood where identity is lost again: "And now, who am I?" (153). At that moment, a Fawn wanders by and they enjoy each other's company without the normal threat of predation. As in the Pigeon scene, Carroll again plays with the idea of classification and hierarchy. Where with the Pigeon Alice is subjected to misclassification, she now finds herself belonging to the same group to which all the other nameless animals belong. Alice is nothing more and nothing less than *just* a nameless animal. For a moment Carroll seems to sketch a biblical Paradise, perhaps the moment of paradise before Adam named the animals. In Tenniel's illustration we see Alice and the Fawn wandering on together, with Alice's arm around the Fawn's neck:

> "What do you call yourself?" The Fawn said at last. Such as soft sweet voice it had! "I wish I knew!" thought poor Alice. She answered, rather sadly, "Nothing, just now."… So they walked on together through the

> wood, Alice would her arms clasped lovingly around the neck of the Fawn, till they came out into another open field and here the Fawn gave a sudden bound into the air, and shook itself free from Alice's arm. "I'm a Fawn!" it cried out in a voice of delight. "And, dear me! You're a human child!" A sudden look of alarm came into its beautiful brown eyes, and in another moment it had darted away at full speed. (154)

Once the names of the species return, each reverts to its own kind; intimacy is impossible and the animal darts away. Predation plays its normal role again and the struggling order of existence returns. Being eaten and predation are recurrent themes throughout both *Alice* books and is a constant anxiety among the animals. Alice asks herself in the beginning of the first book "Do cats eat bats?"(11). She proves to be especially insensitive in "The Pool of Tears" and "A Caucus-Race and a Long Tale" chapters where she is tactless enough to mention her cat Dinah on several occasions, while a cat is the natural enemy of mice and birds.

Classification allows us to compare, sort, cluster and find relationships that are not immediately obvious. Due to his interest in botany, Darwin researched many plants and shortened the distance between animals –including humans- and plants. Carroll does the same on many occasions in the books by not just giving the animals a voice, but the plants as well. An example may be found in the second *Alice* book, where we come across the talking flowers, as described in chapter two of this thesis. Classification can bring nature closer together, but also has the ability to set things apart. Are the traditional kingdoms of mineral, vegetable and animal stable categories? Kingdoms can fall when new research is presented, and even in the present day one wanders if humans may be a different kingdom altogether? Is it because humans have the ability to speak and use language? Is it because, according to Aristotle, they have a rational soul? These questions lead us to the chapter of "The Lion and the Unicorn", in *Through the Looking-Glass*. The Lion and the Unicorn have been fighting for the crown. The unicorn has won his round when suddenly:

> his eye happened to fall upon Alice: he turned round instantly, and stood for some time looking at her with an air of the deepest disgust.

> "What – Is – This?" he said at last. "This Is a Child!" Haigha replied eagerly, coming in front of Alice to introduce her, and spreading out both his hands towards her in an Anglo-Saxon attitude. "We only found it to-day. It's as large as life, and twice as natural." "I always thought they were fabulous monsters!" said the Unicorn … The Lion had joined them while this was going on … "What's this!" he said, blinkingly lazily at Alice … "Are you animal – or vegetable – or mineral?" he said, yawning at every other word. (201)

Alice is here being classified as an "it"; she becomes a thing, an object. Where in the Caterpillar and Pigeon scene Alice is asked *who* she is and *what* she is, in the second *Alice* book, *she* is replaced by the genderless "it". According to Haigha there is a norm, an ideal form for a child, hence the description of Alice "being twice as natural". Carroll reverses the evolutionary way of thinking on this topic. The evolutionary way of thinking about the world, would emphasise a flow of more and more distinct but passing forms for each species. It put the idea and the ideal of 'the norm' under pressure (Beer Alice in Space 137). Darwin was always distrustful of the standard type as an ideal since it was through small divergences that evolution was set in motion. In one of the earlier chapters of *On The Origin of Species* he points out the difficulty of knowing what a new variety is, and what is merely a monster: "monstrosities cannot be separated by any clear line of distinction from mere variations" (39). Being a monster in this context may mean only that you are one-of-a-kind and so cannot reproduce. The Victorians, as has been much explored, were fascinated by individual specimens and people they considered monsters (Lovell-Smith The Animals 396). In mythology, the unicorn is "a fabulous monster" while in the text the opposite seems the case. Alice is the odd one out, the one who deviates from the norm in the *Through the Looking-Glass* world.

Carroll's own interests in growing and growing up, and the *transformation* that it brings within a human life cycle can be found in the chapter, "Advice from a Caterpillar". Alice is given a magical control of her growth by the symbolic Caterpillar: a creature that must go through a sort of death to become an adult. With

that adulthood comes the metamorphoses into a butterfly. It is no coincidence that the Caterpillar in *Wonderland* is very spiritual and philosophical and asks questions about Alice's identity:

> "Who are *you*?" said the Caterpillar…Alice replied, rather shyly, "I – I hardly know, Sir, just at present – at least I know who I *was* when I got up this morning, but I think I must have been changed several times since then." "What do you mean by that?" said the Caterpillar, sternly. "Explain yourself!" "I ca'n't explain myself, I'm afraid, sir," said Alice, "because I'm not myself, you see." "I don't see," said the Caterpillar. "I'm afraid I ca'n't put it more clearly,"Alice replied, very politely, "for I ca'n't understand it myself, to begin with; and being so many different sizes in a day is very confusing." "It isn't" said the Caterpillar. (41)

Alice may find it hard to understand who she is or has become, since her body has undergone change. She simply cannot grasp the idea that anyone else *would* be able to understand it. A caterpillar is used to bodily changes once in his life, and does not feel that he becomes a different person because of it. It was not until the seventeenth century before natural philosophers made the connection that the caterpillar and the butterfly are one and the same species. Their bodily change did not make them a different animal. Alice's changes should therefore not make her a different species; she is still the same Alice, only longer or shorter than "this morning". In *Alice's Adventures in Wonderland*, Carroll makes visible the unruly process of growth all bodies undergo and forget. Again, one cannot deny that growth and evolution have an important similarity: in both cases one cannot be actively present when the evolution or growing definitively happens. They both happen uncontrollably, and outside of our consciousness. In *Wonderland* Alice learns after various mishaps and near death experiences, to finally control and reverse her own growth – to put herself into an ideal functional relationship with the physical world around her. She realises she needs to adapt to her surroundings if she is ever going to make it to the desired garden. Carroll's personal obsession with the evolution of a child into an adult -he mourned the metamorphoses of a girl into a woman via puberty- also shines through

both *Alice* books. The fictional Alice only ages six months between the two novels, pushing puberty out of the picture.

As discussed in chapter 2, it was Lyell's discoveries that made it possible for Darwin to develop his own theory of evolution: the earth was much older than initially thought and small changes happened incrementally over millions of years. The world is constantly evolving; it is not a static design, and changes certainly do not happen overnight. This idea of 'time' is a very fertile one, as it is decidedly literary: stories take place in time. Darwin's theories changed the concept of time at a scientific and cultural level. This undoubtedly has an effect on literature. Time and the troubles it causes, haunt both the *Alice* books. Before Alice falls into the rabbit hole she observes the dapper white Rabbit who is consulting his waistcoat pocket-watch. It is the concept of time that is essential here: Alice is not startled by the rabbit itself, but by its use of a *watch*:

> There was nothing so *very* remarkable in that; nor did Alice think it's so *very* much out of the way to hear the Rabbit say to itself "Oh dear! Oh dear! I shall be too late!" (when she thought about it afterwards, it occurred to her that she ought to have wondered at this, but at the time it all seemed quite natural); but, when the Rabbit actually *took a watch out of its waistcoat-pocket*, and looked at it, and then hurried on, Alice started to her feet, for it flashed across her mind that she had never before seen a rabbit with either a waistcoat-pocket, or a watch to take out of it, and, burning with curiosity, she ran across the field after it, and was just in time to see it pop down a large rabbit-hole under the hedge. (10)

Being late, anxiety about that, and a watch all signify the adult time-regulated world. The Rabbit is an animal, which talks, but that's not what Alice finds remarkable: it's the accoutrements of adult business, and indeed busy-ness: waistcoat-pocket and watch (Beer *Alice in Space* 29). The watch usually symbolizes the human capacity to invent complex technology. But here we encounter a rabbit, an animal, who owns a watch and can read it, and that sets off the whole sequence of Alice's adventures.

Space and time were during Carroll's lifetime coming to be understood more and more as being in complex and shifting relations, both locally and worldwide. Chronometers kept time at sea and helped in the mapping of colonial claims, bringing time and space together (Beer Alice in Space 30). The new technology of the photograph froze a certain moment in time, which might be one of the appealing reasons Carroll was drawn to it. Alice's experiences with shrinking and growing, is set on hold in real life, by a photograph where the child can have the ideal age forever.

When Alice falls into the rabbit-hole Carroll manipulates the laws of time and gravity. Alice floats instead of falling straight down, and while she must be ten times as heavy as an "empty jar of marmalade" (10), her fear is that not she, but the jar will crush something at the end of the fall. Laws of motion had for the Victorians become one of the most controversial aspects of time and Carroll uses this by reversing the laws of nature (Beer Alice in space 37). Alice's fall is also a direct reference to the genre of a dream text: she is falling asleep and she here acts out that phrase by a literal fall into a rabbit-hole.

In chapter seven of the first *Alice* book, "A Mad Tea-Party", Carroll gives time – or in this case Time- an active role in the narrative by turning it into a personification. Time jumps from lowercase to uppercase <t> when the Hatter claims Time to be his acquaintance. The Hatter does so after Alice is annoyed by the riddle without an answer: "Why is a Raven like a writing desk?". Alice proves herself to be very human when she remarks that a riddle without an answer is a waste of *time*:

> Alice sighed wearily. "I think you might do something better with the time," she said, than wasting it in asking riddles that have no answers." "If you knew Time as well as I do," sat the Hatter, "you wouldn't talk about wasting *it*. It's *him*." "I don't know what you mean," said Alice. "Of course you don't!" the Hatter said, tossing his head contemptuously. "I dare say you never even spoken to Time!" "Perhaps not," Alice cautiously replied; "but I know I have to beat time when I

> learned music." "Ah! That accounts for it," said the Hatter. "He wo'n't stand beating." (63)

First of all, there is the pun on "beat": to stay in the right musical rhythm becomes an act of violence when time is personified. Second, Time - as the Hatter says - will work with you but only if you appreciate him. Time will jump from nine in the morning to dinnertime: "For instance, suppose it were nine o'clock in the morning, just time to begin lessons: you'd only have to whisper a hint to Time, and round goes to clock in a twinkling! Half-past one, time for dinner!" (63). The Hatter afterwards admits that he has had a quarrel with Time last March and since then they are stuck in *time* forever: "It's always 6 o'clock now!" … "it's always tea-time, and we've no time to wash the things between whiles." (64). Instead of time passing by, they all must move around the table in clockwise fashion. The concept of time for the Hatter is different to the conventional one. It is not tea time because it is six o'clock; however as it is tea time, it must be six o'clock. This is the reason why the Hatter, March Hare and the Dormouse can continue their conversation within this scene, because tea-time is not a finite period of time. Indeed, the Hatter's watch "tells the day of the month, and doesn't tell what o'clock it is"(62). At the end of the first book Carroll refers to the tea party once more, when Alice's older sister tells the newly woken Alice: "It *was* a curious dream, dear, certainly; but now run into your tea: it's getting late" (109). With that remark Carroll stops the dream-time immediately, and humanises the text with the past tense "was" and with "getting late". Time in the world of humans is full of rules and therefore has a beginning and an ending.

Carroll's choice to present his *Alice* books as dream texts may not be merely a matter of style. Dream texts, in general, share with the theory of evolution the property of presenting experience as at once past and yet in progress now. Once you have realised what has happened the event has already taken place. Carroll subverts this process by presenting time in a backwards order in *Through the Looking-Glass*. In this second *Alice* book people are imprisoned before they commit a crime, the Queen screams before she pricks herself, and if you want to stay in one place you must run fast:

> "Well, in *our* country," said Alice, still panting a little, "you'd generally get to somewhere else –- if you ran very fast for a long time as we've been doing." "A slow sort of country!" said the Queen. "Now, *here*, you see, it takes all the running *you* can do, to keep in the same place. If you want to get somewhere else you must run at least twice as fast as that!" (Carroll 143)

In *Through the Looking-Glass* Alice becomes aware that our agreements on time are peculiar, and not necessarily the only pattern available. Much like Carroll's contemporaries must have felt with the publication of Darwin's theory. Suddenly, everything and more could be possible in real life as well as in the text. The White Queen recalls:

> "we had *such* a thunderstorm last Tuesday –- I mean one of the last set of Tuesdays, you know." Alice was puzzled. "In *our* country," she remarked, "there's only one day at a time." The Red Queen said "That's a poor thin way of doing things. Now *here*, we mostly have days and nights two or three at a time, and sometimes in the winter we take as many as five nights together –- for warmth, you know." "Are five nights warmer than one night, then?" Alice ventured to ask. "Five times as warm, of course."(224)

Instead of the normal rhythm of time, the Queens sleeps five nights in a row like an animal hibernation, to survive the cold weather.

The examples described in this chapter show that not a single creature in the *Alice* books acknowledges its own animality as a mark of its inferiority. However, some question Alice's identity and all question her superiority as a human. The natural historical gaze of humans observing nature has been turned around by Carroll in both *Alice* books. While *Wonderland*'s physical changes make due to the physical changes she experiences in Wonderland, Alice even starts to question her *own* identity and her relation to the animals. The fall into the rabbit-hole makes the dream very physical and absorbs her whole body. The struggle for existence is felt very much on the surface with the constant anxiety of to eat or to be eaten, natural

predators and the ongoing classification of Alice. *Through the Looking-Glass* is less reassuring about who is dominant over the dream: did the Red King dream it or did Alice? In several ways, Alice has much more control over her own body in the second book than in *Wonderland*. Although, she travels through space and time and loses her name and with it her identity, her body remains stable. Although the classification does not stop in the second book, Carroll focuses much more on the ever changing scenery to which Alice must adapt.

Conclusion

This thesis has set out to argue that Lewis Carroll was influenced by Darwin's evolutionary theory in writing his *Alice* novels. The illustrated examples in the close reading are made plausible by demonstrating how and when Carroll could be exposed to Darwin's theories.

As shown in the first chapter the distinction between the arts and science was not so tightly drawn in the nineteenth century. Scientists quoted famous poets in their work, and novelists explored the implications of scientific theories. Both disciplines were accessible to all readers: newspapers and periodicals were set side by side with fiction, travel journals and literary criticism. Scientists could even improve their credibility when they showed they were well rounded, and thus in possession of expertise on the classics as well as in their own field.

To set my argument in motion, I have shown evolutionary theory in general was not new in the Victorian period. Centuries before Darwin, natural philosophers already tried to solve the mystery of the origin of human life. The theories of his predecessors like Erasmus Darwin, Lamarck, Lyell and Malthus already appreciated the crucial principles like gradual change over long time periods, varieties, inheritance and shared ancestry. All of these principles found their way into Darwin's work, providing a solid base for Darwin to develop his own theory. Carroll, a well rounded Oxford scholar, was in fact familiar with the theories of Darwin's predecessors: he was in the possession of numerous of their works.

Charles Darwin stood out from his predecessors and contemporary scientists for many reasons. First of all, he was already an established and honoured scientist at a very early stage of his career. Even before publishing *on The Origin of Species* he had been awarded a Royal Medal for his work. From his circle of fellow academics, his fame expanded to the rest of society as the publication of *on The Origin of Species* in 1859 was widely read by people in all walks of life. Next to its obvious scientific merit, the wide-spread success of his book was largely due to his use of an

understandable vocabulary when explaining new insights on evolutionary theory. Soon after its initial publication, his work was translated into many other languages. Another strong argument backing up the notion that Carroll to have known Darwin is the fact that the famous debate on evolution took place in Oxford, during the time Carroll was appointed there.

It is well documented that the contents of Darwin's theory, and particularly the proof he was able to provide for that content, had a dramatic impact on society as a whole. Its impact on literature might not be direct, but is noticeable nonetheless. Darwin's central themes of variation amongst species, the struggle for existence, natural selection and inheritance were echoed in literary themes like time, change, death and extinction. Therefore, it is clear that Darwin's theory has had an enormous influence on literature and its narrative form.

The genre of children's literature proved to be fertile ground for these 'evolutionary' literary themes. In the Victorian age, the genre was relatively new, and resulted from the then cherished Romantic image of the child as the highest form of a human, the closest in line to God. It was generally believed that children's imaginations needed to be cherished and should not only be indoctrinated with moralising literature full of fear and punishment. For the very first time books for children were written merely to amuse them, to give them something to look forward to, with imaginary worlds and creatures. This new type of literature would require the reader to accept certain truths that might not seem logical or tangible at first. Darwin asked something similar of his readers: to imagine certain processes to be true, even though they cannot immediately be seen or experienced. Maybe that is why evolutionary themes have been echoed in children's literature even before the *Alice* books. An example of such a children's novel is Charles Kingsley's *The Water-Babies*. Kingsley used evolutionary principles in his book, especially the concept of transformation over time: his main character Tom *evolves* from a chimney sweeper into a water-baby, only to end up as a sophisticated man of the world.

The previous remarks clarify the cultural historical context in which Lewis Carroll wrote *Wonderland* and *Through the Looking-Glass*. It aims to provide a proper

framework which systematically proves Carroll's exposure to evolutionary theory. However, to prove his personal interest in evolutionary theory, one needs to research his life through this lens. Luckily, Carroll managed to keep a diary during almost his entire life. He described his encounters with the real Alice Liddell, and many other children, in great detail. Childhood always played an important part in Carroll's life and in his work the *transformation* a human undergoes within a single life cycle is therefore an important theme. Carroll's ideal form of beauty was that of girls up to the age of twelve. With the art of photography Carroll was able to pause the transformation and growing of a child. This might be one of the reasons this form of art was so appealing to him. It is also this love for photography that links him directly to Darwin's evolutionary theory, as he photographed many natural historical subjects, including his friend Reginald Southey facing a sequence of human and ape skeletons. Although we cannot be absolutely certain Carroll attended the famous 1860 debate on evolution at his own university, it is highly likely he was present at this important and highly anticipated event. He even served on the reception committee for the foreign scientists attending the debate, and took several pictures of the participants, including Bishop Wilberforce and T.H. Huxley. When going through Carroll's and Darwin's correspondence a couple of letters can be found where Carroll offers his photographs to illustrate Darwin's future research. In the end Carroll was not only familiar with Darwin or just interest in his theories, he was even actively looking to associate his work with Charles Darwin's.

A close reading of the book has resulted in numerous examples revolving around evolutionary themes as 'time' and 'classification'. The struggle for existence, the distinctive Darwinian part of evolutionary theory, is very much present within the book's constant anxiety regarding predation. The physical changes Alice undergoes in *Wonderland* prepare her for the ever changing scenery to come in *Through the Looking-Glass*. Alice learns, through her encounters with the animals, that she needs to adapt in order to survive both novels. These bodily *transformations* are accompanied by Alice's questions about her own identity, a feeling which must have been mutual to many Victorians. Darwin's theory is very clear about the absence of

an active agent in evolution. This raised questions about identity like never before. Carroll therefore likes to invert the natural historical gaze in which humans normally observe animals, resulting in an alternative Victorian world where Alice can be felt to be merely an animal herself.

Although Carroll and Darwin were contemporaries, it is not immediately obvious they would be familiar with, let alone be interested in, each other's work. Considering the evidence presented in this thesis, one can only reach the conclusion that Lewis Carroll was in fact strongly aware of Darwin's theories, and was fascinated by them. The evolutionary influence was not limited to the plot, but was stretched to the narrative form of *Wonderland* and *Through the Looking-Glass* as well. In both *Alice* books, Carroll plays with the notion of change through many different time frames. In that light, the examples of evolutionary themes in the *Alice* books can not only be seen as a confirmation of the central thesis statement, it proves that Carroll actively directed the narrative form according to Charles Darwin's evolutionary theory in writing his *Alice* novels.

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