“THE GREAT FAIRY SCIENCE”: THE MARRIAGE OF NATURAL HISTORY AND FANTASY IN VICTORIAN CHILDREN’S LITERATURE

A Dissertation presented to
the Faculty of the Graduate School
University of Missouri-Columbia

In Partial Fulfillment
Of the Requirements for the Degree

Doctor of Philosophy

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DECEMBER 2009

The undersigned, appointed by the Dean of the Graduate School, have examined the dissertation entitled

"THE GREAT FAIRY SCIENCE":
THE MARRIAGE OF NATURAL HISTORY AND FANTASY
IN VICTORIAN CHILDREN'S LITERATURE

Presented by Joseph Green

A candidate for the degree of Doctor of Philosophy

And hereby certify that in their opinion it is worthy of acceptance.

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For my parents
Jennings and Jerolyn Green

ACKNOWLEDGEMENTS

This dissertation is the result of a long and convoluted process that involved various starts and stops. I sincerely thank all of my committee members for their willingness to work with me under the tight time constraints that I created by returning to finish in my final semester. Without the patience and support of Dr. Noah Heringman, Dr. Elizabeth Chang, Dr. Howard Hinkel, and Dr. Richard Bienvenu, this project would not have reached completion. My special gratitude goes to my advisor, Dr. Nancy West, whose encouragement and gentle prodding particularly kept me focused in the final months of writing. Her insightful feedback on multiple chapter drafts in a relatively short span of time demonstrated both her confidence in me and her desire for my success.

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ABSTRACT

This dissertation explores the merging of two unlikely literary partners — natural history writing and fantasy — as a subgenre of mid- to late nineteenth century British children’s literature. Tailoring natural history for children, the religiously-motivated writers discussed in this study desired to instill in their readers a respect and appreciation for nature. As the nineteenth century advanced, the natural world for many Victorians slowly lost its moral and divine significance in the face of rapid economic, technological, and scientific change. From the natural theology of Margaret Gatty to the providence-guided evolution of Charles Kingsley to the spirituality of Arabella Buckley, I contend that these writers coupled fantasy with science and natural history to invest nature again with the wonder and mystery that modernity had taken away.

Introduction

> To a person uninstructed in natural history, his country or sea-side stroll is a walk through a gallery filled with wonderful works of art, nine-tenths of which have their faces turned to the wall. Teach him something of natural history, and you place in his hands a catalogue of those which are worth turning around.
>
> T.H. Huxley, "On the Educational Value of the Natural History Sciences" (1854)

> "For the great fairy Science, who is likely to be queen of all the fairies for many a year to come, can only do you good, and never do you harm"
>
> Charles Kingsley, The Water-Babies (1863)

Elizabeth Eastlake, Victorian author and art critic, cautions in an 1842 essay in the Quarterly Review that combining science and religion in a work for children might be harmful to a child's faith, as it could not be "conducive to the soundness of his [the child's] future faith to accustom a child to believe only what he can understand" (71). Ironically, science and religion had been comfortable partners in children's literature since the early eighteenth century, as many writers considered it morally uplifting for young people to reflect on the divine nature of the world. Eastlake here does not oppose science, but she does fear that placing scientific concepts on an equal footing with religion or, even worse, allowing

science to overshadow religious precepts, would lead a child to mistakenly choose science over religion as the path to truth. Her cautions are valid; as the nineteenth century progressed, science's need to explain the world with empirical facts would inevitably conflict with traditional religion's faith in supernatural forces in nature.

In contrast, twenty years later in 1862, James Hinton argues in an essay titled "The Fairyland of Science" that science and industrialization have validated the childhood belief in a fairy world. What had only existed in the imagination was now reality: the magic mirror was now the telescope, the seven-leagued boots of Jack the Giant-killer was now the railway train, and the magical power of Aladdin's ring had become the electric telegraph. Hinton notes, however, that "[b]y science man may control nature, and work marvels that outrival magic, but in the very act he concedes that the world is not what it seems" (37). As Eastlake had feared, religion was no longer the main lens through which to view the world. Science offered miracles of its own, making possible what had only once been imagined. The growing authority and progress of science, unfortunately, brought an accompanying sense of

disenchantment as magic and wonder vanished in the light of scientific fact. Hinton, however, interprets this disillusionment as false; for him, scientific endeavor creates a new kind of fairyland, one that works at revealing the invisible world around us through an understanding of physical laws.

This idea of an invisible world of nature is the focus of my dissertation. My study explores the merging of two unlikely literary partners -- natural history writing and fantasy — into a subgenre of mid- to late nineteenth century children's literature. I argue that fantasy, which began to appear in natural history works in the 1850s and 1860s, shared a common interest with science in the unseen and the unknown. Natural history may seem like the more realistically grounded subject because, with fantasy, we often think of things that are not real, not true, not possible, but the etymology of the latter term reveals a more insightful meaning. "Fantasy" derives from the Greek word phantasia, meaning "making visible." To make something visible, of course, implies that it is already present. In the nineteenth century, fantasy allowed for the unknown and the invisible to be revealed while science was steadily unveiling nature's secrets. In an increasingly skeptical

age, fantasy offered what religion used to offer in an age of unquestioning faith: a means of escaping inward into the realms of the mind and the spirit.

My study focuses on the time period of 1850-1890 for two reasons. First, these four decades coincide with the beginnings of what is often traditionally referred to as the "Golden Age" of children's literature, and particularly of children's fantasy, ushered in by Lewis Carroll's Alice in Wonderland (1865) and ending with A.A. Milne's Winnie-the-Pooh books (1924-1928). This productive period of imaginative literature for children fostered creativity and experimentation among its readers, characteristics that equally apply to natural history writing for children during the same time period. Secondly, these four decades include the major topic of scientific debate in the century: Darwin and natural selection. In this study, I use this topic as a type of litmus test to determine how the three authors I have selected -- Margaret Gatty, Charles Kingsley, and Arabella Buckley -- use fantasy to deny, endorse, and/or modify Darwin's ideas in their own work for children.

In selecting authors for this study, I looked for those who integrated their natural history interests with

their religious beliefs via the use of fantasy. Tailoring natural history for children, the three writers discussed in this dissertation desired to instill in children a respect for nature, while advocating particular ideological views of nature ranging from natural theology to natural selection. In promoting their respective views, however shaped by their personal religious faith, all three authors grounded their arguments in the scientific knowledge of their day.

Chapter One lays the contextual foundation for the dissertation by providing a brief historical survey of British children's literature that features natural history and fantasy between 1700 and 1850 looking at their specific points of convergence. I particularly emphasize the changing concepts of childhood during the early nineteenth century and the effects these two genres were popularly believed to have on children. The parallel journeys of natural history and fantasy writing mirror the age-old dictum of literature to instruct and amuse. Ever since the Roman poet Horace (65-8 B.C.) claimed that poetry should be dulce et utile, "sweet and useful," Western literature has traditionally been seen as having the dual purpose of educating and entertaining readers. Natural history, in

particular, was often seen in the eighteenth and nineteenth centuries as a "rational amusement," one that provided moral and practical benefits as people elevated their minds and studied the workings of nature to grow closer to God. Fantasy, on the other hand, initially possessed a reputation as pure entertainment, and only in the 1840s began to assume a didactic function in many works. After examining the historical roots of these two genres, I then focus on the generic characteristics of natural history writing and fantasy, particularly as they are illustrated in the time period under study. I present a theoretical basis for my subsequent discussion of how and why the authors covered in this dissertation integrated these genres in their works.

After this preliminary background, I continue on to the three authors I have chosen, discussing each in chronological order. In Chapter Two, I examine the work of Margaret Gatty (1809-1873), a mid-Victorian writer, editor, and naturalist. Born the same year as Charles Darwin, Gatty was raised in a culture that was steeped in natural theology. Although a self-trained naturalist whose observational skills were admired by others in the field, Gatty disliked the shift she was seeing from religious to

secular explanations of the world offered by materialistic science, such as that reflected in Darwin's theories. In this chapter, I focus on Gatty's Parables from Nature, a five-series volume of work published between 1855 and 1871. Grounded in natural theology, her parables effectively combine science, religion, and fantasy to emphasize how nature is inextricably intertwined with moral and spiritual issues. Her parables are essentially fables whose characters come directly from nature -- caterpillars, seaweed, butterflies, songbirds. She adds a solid scientific foundation to her parables by way of descriptive details. As I argue, Gatty looks back to the maternal tradition of women popularizers in the early nineteenth century – that is, popularizers who felt it was their duty to educate young people about the natural world as a way to appreciate the power of God.

Charles Kingsley (1819-1875), the subject of Chapter Three, is the one author in the dissertation who could be considered canonical. A clergyman, he is best known for his social reform novels Yeast (1849) and Alton Locke (1850), which describe the plight of agricultural workers and tailors respectively. Like Gatty, Kingsley was a committed naturalist, seeing nature as a way to understand God

better. In contrast to Gatty, though, Kingsley saw little in Darwin's ideas that he could not reconcile with his own beliefs; indeed, for him, providence was still present as the First Cause even if natural selection was the mechanism for evolution. My discussion of Kingsley is grounded in his children's novel The Water-Babies: A Fairy Tale for a Land Baby (1863), an account of the physical and moral evolution of the young chimney sweep Tom. The immediate popularity of this eccentric fantasy placed Kingsley as one of the leading Victorian fantasists for children, along with George MacDonald (1824-1905) and Lewis Carroll (1832-1898).

Turning from the fictional narratives of Gatty and Kingsley, I move next to a discussion of Arabella Buckley (1840-1929) in Chapter Four. Although her writing expresses just as much passion about nature and science as Gatty's and Kingsley's, Buckley differs from these two authors in that her works are nonfiction texts. Whereas Gatty and Kingsley use fictional plots as vehicles for their ideologies, Buckley conveys factual information in a textbook format that borrows stylistic devices from fantasy to charm readers who more than likely "look upon science as a bundle of dry facts" (Fairyland 1). In The Fairyland of Science (1879), a series of lectures on topics ranging from

evaporation to pollination, she creates a narrative that infuses the scientifically detailed processes with a sense of magic, showing that the powers of nature are as diverse and as wondrous as those of any fairy creatures. Life and Her Children (1880) and Winners in Life's Race (1882) describe the invertebrate and vertebrate divisions, respectively, of the animal world. Admiring the work of scientific naturalists such as Darwin and Huxley, Buckley melds her own views with theirs by framing her scientific message within the moral dimensions of evolution. In her writing, Buckley shapes this modified form of Darwinism by drawing on the tenets of spiritualism, a late Victorian movement that fascinated her. She is a firm believer in a "life principle" or "spirit" that is passed on through the process of evolution, and evidenced by a sense of sympathy and mutual aid among the higher animals.

These three writers vary in their religious beliefs, scientific interests, and literary uses of fantasy. They do share, however, a faith in the intellectual and moral benefits that study of the natural world could offer young people. As the nineteenth century advanced, the natural world for many Victorians slowly lost its moral and divine significance in the face of rapid economic, technological,

and scientific change. From the natural theology of Gatty to the providence-guided evolution of Kingsley to the spirituality of Buckley, I contend that these natural history writers coupled fantasy with science to invest nature again with the wonder and mystery that modernity had taken away.

Chapter 1

Nurseries of Fact, Nurseries of Fancy: The Parallel Journeys of Natural History and Fantasy for Children to 1850

There about the beach he wandered, nourishing a youth sublime,
With the fairy tales of science, and the long result of time.
Alfred, Lord Tennyson, "Locksley Hall" (1842)

In the preface to his children's natural history book The Fairy Tales of Science (1859), John Cargill Brough, science journalist and lecturer, attests to have "endeavoured to divest the different subjects treated in it of hard and dry technicalities, and to clothe them in the more attractive garb of fairy tales" (iii). A quick glance at the table of contents -- with such chapter titles as "The Age of Monsters," "Modern Alchemy," "The Magic of the Sunbeam," "The Mermaid's Home," "Water Bewitched," and "The Invisible World" -- reveals the "attractive garb" that Brough has designed. Despite the fairy tale titles, however, each chapter focuses on genuine scientific details and explanations, ranging from prehistoric pterodactyls and iguanodons to the revelations of the modern microscope. Emphasizing that "science has a magic of its own" in its conveyance of "the wonders of scientific knowledge" (Bown

108), the fairy tale metaphor binds together the traditional doctrines of literature to instruct and to amuse. The unusual juxtaposition of such words as "fairyland" and "science" or "nature" appears in many mid- to late-nineteenth century natural history books for children — Fairy Know-a-Bit, or a Nutshell of Knowledge by A.L.O.E. [C.M. Tucker] (1866), The Fairyland of Science (1878) by Arabella Buckley, The Fairy Tales of Science, being the Adventures of Three Sisters, Animalia, Vegetalia, and Mineralia (1886) by X.B. Saintine, Nature's Fairy-land: Rambles by Woodland, Meadow, Stream and Shore (1888) by H.W.S. Worsley-Benison, and The Fairyland Tales of Science (1891) by the Rev. J. Gordon McPherson.

To understand how these two genres of natural history writing and fantasy -- one based on fact and the other on fancy -- converged at this time for Victorian child readers, we must first look at the beginnings of children's literature in general and the often contrary relationship of natural history and fantasy in particular. Thus, the bulk of this chapter traces the historical development of British natural history writing and fantasy for children to approximately 1850, the starting point of my study. By providing this historical context, I show that the creation

of a new hybrid genre that merges the two original literary genres was inevitable. At the end of this chapter, I then introduce foundational concepts and definitions necessary for understanding natural history writing and fantasy as both separate and united literary genres in the Victorian period.

Before I proceed further with the historical background, though, I also must clarify one potentially problematic area in my account of natural history. As Lynn Merrill suggests, the definitions of the terms "science," "biology," and "natural history" were in flux throughout the nineteenth century (6). Some writers at different times refer to their works as "natural history"; others prefer the term "science." For consistency's sake, I use the term "natural history" throughout my dissertation when referring to the genre of a text and "science" when describing the content of the work.

British Natural History Writing and Fantasy to 1850

The need for children's literature of any kind, imaginative or factual, can be traced to the seventeenth century with the modern idea of childhood as a "qualitatively distinct stage of life" and the accompanying

concern regarding children's psychological and spiritual growth (Richardson 8). Previously, childhood had been often "totally submerged within the larger interests of the adults" (Smith 30). Although finally seen as distinct individuals in early modern England, children were also seen as susceptible to the wrong influences. Seventeenth-century Puritans and eighteenth-century evangelical writers often promoted a Christian moralist model of childhood which saw children as having been born in sin and thus being particularly vulnerable to the snares of Satan; consequently, children were in great need of discipline to ensure their salvation. James Janeaway's popular Puritan work A Token for Children (1672), for instance, offers thirteen grim, spiritual role models for children in tales of the "Exemplary Lives and Joyful Deaths of Several Young Children." In the preface, Janeway exhorts parents to be diligent regarding their children's spiritual upbringing: "Are you willing that they [the children] be Brands of Hell? Are you indifferent whether they be damned or saved?" (qtd. in Thwaite 26). Firmly based on the concept of original sin, such works intended to frighten youth, and parents, into compliance with strict codes of morality.

In contrast, Enlightenment intellectual ideals, particularly those of John Locke and Jean-Jacques Rousseau, offered less dogmatic views of childhood. Both men promoted educational philosophies which defined children as capable of developing into rational, enlightened human beings. In Essay Concerning Human Understanding (1690), Locke rejects the idea of original sin, seeing instead the child's mind at birth as a "white paper, devoid of all Characters" (17) and waiting to be inscribed. The key assumption is that children enter the world as pure and rational creatures of nature, untainted and receptive to education that will prepare them to live in society. He further argues in Some Thoughts Concerning Education (1693) for changes in the principles guiding the upbringing and education of children. Adults are encouraged to apply formal discipline to help shape the child's progress to adulthood, but this discipline should not use fear in its enforcement. A child's natural impulses should be used to develop reason and moral virtue: "When by these gentle ways he [the child] begins to be able to read, some easy pleasant Book suited to his Capacity, should be put into his Hands, wherein the entertainment, that he finds, might draw him on, and reward his Pains in Reading, and yet not

such as should fill his Head with perfectly useless trumpery, or lay the principles of Vice and Folly" (124). For appropriate reading material for children, Locke advocates Aesop's Fables (c. 6th century B.C.E.) and versions of the medieval tale Reynard the Fox, in addition to the scriptures. The fable's emphasis on morals, its brevity in telling, and the clarity in style aid in the child's understanding and illustrate Locke's most influential argument regarding children's education, an emphasis on instruction through amusement. Locke's dictum "to make all that they [children] have to do, sport, and play too" (44) gradually shifted attention from the sin/salvation model to one of psychological and moral development in children, a model that would remain essentially unchanged for more than a century.

This pedagogical theory leads logically to the conclusion that children are capable of goodness if provided proper lessons of morality and conduct. The instruction a child receives should be discriminating, however. Disapproving of the irrational, Locke warns of the impressionable minds of children and believes "it inconvenient, that their [children's] yet tender Minds should receive early impressions of Goblins, Spectres, and

Apparitions, wherewith their Maids, and those about them, are apt to frighten them into compliance with their orders" (153) and children are thus made "afraid of their Shadows and Darkness all their Lives after" (109). This caution against the irrational, voiced in 1693, became partly the basis for the discouragement of fantasy for children for the next one hundred and fifty years. Although Locke's ideas were not new, his words carried weight and helped solidify the view of childhood as a separate stage of development from adulthood. Eighteenth-century rationalism would demand the "inculcation of rational and moral behavior in conjunction with any and all academic subjects" (Shefrin 3) in order to emphasize the importance of moral education in the formation of character.

In 1762, Jean Jacques Rousseau wrote his philosophical novel Emile: or, on Education, which suggests an interpretation slightly different from, though just as secular as, Locke's about a child's essential nature. For him, children were neither souls in need of salvation nor completely blank slates but rather repositories of innocence. Rousseau claims that children come into the world with intrinsically good qualities and with all the faculties needed to begin their own development. These

faculties must be nurtured by a "natural education" that preserves children's innocence and freedom, and protects them from the inevitable corruptions of society. The ideal situation is a tutor and pupil learning from nature; for Rousseau, "the child who reads does not think" (168). Social institutions such as formal education sap the individuality and curiosity of the child. In fact, he asserts that "nature wants children to be children before being men. . . . Childhood has its own ways of seeing, thinking, and feeling which are proper to it. Nothing is less sensible than to want to substitute ours for theirs, and I would like as little to insist that a ten-year-old be five feet tall as that he possess judgment" (90). Unlike Locke, Rousseau could recommend only one book appropriate for his Emile, Daniel Defoe's Robinson Crusoe. This novel exemplifies "the most felicitous treatise on natural education" (184) since it illustrates a practical education in which one learns not from books but from nature and experience. Crusoe's self-reliance and solitary struggles against the forces of nature provide examples to emulate. In contrast, reading such literature as fables only deceives children as to life; "fables can instruct men, but the naked truth has to be told to children" (112-113).

Active curiosity stirs a child to discover further on his own.

By the mid-eighteenth century, two traditions fed into what we now categorize as children's literature. On the one hand, religious and conduct books designed for children continued the blunt moral and spiritual instruction that earlier writers such as James Janeway and Isaac Watts had established. On the other hand, fantasy, particularly fables and fairy tales, primarily existed to entertain adults as well as children. Several critics, most notably Geoffrey Summerfield and F. J. Harvey Darnton, have described the second half of the eighteenth century as a continuous competition between reason and fantasy, fact and fancy.

Locke's and Rousseau's educational theories, overlaying traditional Christian morality, not only reinforced new understandings of childhood but also helped create a new readership for books in the eighteenth century. Although several ostensibly adult books with exciting plots and evocative settings — Pilgrim's Progress (1678), Robinson Crusoe (1719), and Gulliver's Travels (1726), for instance — had been, and still are, appropriated by children as their own, the new perception

of childhood created for the first time both the need and the demand for children's books that stimulated youthful imaginations while reinforcing messages of morality and conduct. No matter what image of the child prevailed — a miniature adult, a soul prey to Satan's snares, or a free spirit — the books given to children were meant to instruct young minds in the values of their elders. It was to the parents' advantage to carefully structure, monitor, and control the nature of children's activities even while treating the young with care and acknowledging their identity as children. Locke's and Rousseau's encouragement of rational judgment and the distrust of unrestrained imagination would fix the path for children's literature for the next century.

Books written expressly for children, though initially limited to alphabets and readers, began to flourish in the 1740s and 1750s. A child-centered literature acknowledged children's desire to be amused in order for them to learn effectively. One of the first publishers to recognize and target this new juvenile market was John Newbery. In 1744, shortly after establishing his business in London, Newbery published a neatly bound book titled A Little Pretty Pocket-Book, which was "intended for the Instruction and

Amusement of little Master Tommy and pretty Miss Polly; with an agreeable Letter to each from Jack the Giant-Killer; as also a Ball and Pincushion, the Use of which will infallibly make Tommy a good Boy and Polly a good Girl" (qtd. in Bator 48). The frontispiece shows a woman, possibly a mother or governess, teaching a boy and a girl. Beneath the illustration is the inscription "Delectando monemus. Instruction with Delight" (Darton 2). Prefaced with a lecture on education "humbly address'd to all Parents, Guardians, Governesses," this children's book reveals Locke's influences on Newbery as it incorporates games and amusement while also emphasizing lessons on manners and morals (qtd. in Gillespie 8).

Locke's educational theories reinforced Newbery's "own optimism about human nature, especially child nature" (M. Jackson 86), an optimism that also shaped his ideas about the kinds of children's books needed in the nursery. Indeed, Newbery viewed the nursery as an apt metaphor, particularly for middle- and upper-class childhood. In the physical sense, the nursery was often an unseen, domestic place, usually located at a distance from the adult household. In this protected space, the child was safe from the dangers of the outside world, including radical and

inappropriate ideas. Yet the nursery was also an exiled space, separated from the adult world in order not to inconvenience adults who must pursue adult matters. Though ostensibly ruled by concerned parents or their surrogates, nursemaids and governesses, the nursery literally and symbolically gave children a world of their own. Newbery's awareness of this world contributed to his particular success as a writer and a publisher. Knowing his audience, he published books for the nursery that were physically attractive to children – small format, illustrations, bound in brightly-colored paper – and whose content was morally attractive to parents and educators.

Although this desire to amuse and instruct became popular with many children's writers in the late eighteenth century, the latter impulse was almost always valued over the former. The eventual fusion of Rousseau's practical education with Locke's rational ideas about childhood resulted in educational theories that focused on the moral and practical education of the child. Because of the supposedly undisciplined juvenile mind, many educators expected children's stories either to dispense useful information under a thin gloss of entertainment, or else to impart important moral and religious principles.

Natural history, descriptive and factual by nature, consequently served as an ideal subject matter for the utilitarian focus of education. Natural history books recorded observations and organized the natural world, and worked particularly well when written for children because, as with most children's literature, natural history is "visual, concrete, deals with things on a small scale, and enters other worlds" (Merrill 39). Such books were ideal moral instruments as well since the study of natural history revealed God's creation and man's place within it.

Just as fictional works originally written for adults had been embraced by children, so were many natural history books. Children's knowledge of flora and fauna, for instance, had largely come from illustrated bestiaries and herbals such as Edward Topsell's Histories of Four-Footed Beasts and Serpents[1] (1658). Not until 1730, as Harriet Ritvo notes, was the first zoological book published specifically for English children. This book, Thomas Boreman's A Description of Three Hundred Animals, includes both real (the lion and the bear) and imaginary (the unicorn and the lamia) beasts, with the latter group often described and illustrated with equal detail and seriousness

as the former group (75). Indeed, the boundary between fact and fancy remained blurred.

In addition to his success in publishing moral tales, Newbery had also realized the commercial and educational potential of natural history books for children. From 1745 to 1758, for example, Newbery published a ten-volume work titled Circle of the Sciences, which covered such wide-ranging subjects as grammar, writing, arithmetic, rhetoric, poetry, geography, and logic, and he hoped that "the Whole will seem rather an Amusement than a Task" (qtd. in Thwaite 203). Inexpensive scientific children's books provided a view into natural history. In 1750, Newbery's juvenile encyclopedia, A Museum for Young Ladies and Gentlemen, offered a range of natural philosophy topics, from lists of weights and measures to a presentation on planetary motion (Secord 130). In 1752, Newbery published his Pretty Book of Pictures for Little Masters and Misses; or, Little Tommy Trip's History of Birds and Beasts.

Still, the most significant and most successful natural history work by Newbery is a popularization of Newtonian science in 1761, which he titled The Newtonian System of Philosophy, Adapted to the Capacities of Young Gentlemen and Ladies and Familiarized and made Entertaining

by Objects with which They are Intimately Acquainted.[2] A fictional author, Tom Telescope, gives a series of scientific lectures on the mechanistic universe of Newton to a group of young natural philosophers called the Lilliputian Society, in reference to Jonathan Swift's Gulliver's Travels (1726). Tom's lectures and demonstrations range widely, covering the solar system, properties of matter and motion, the physical features of the earth, and the five senses of man (Thwaite 203). A true Lockean disciple, Newbery had borrowed the factual content of this text from Locke's The Elements of Natural Philosophy (1720). While Locke's emphasis in the earlier work had primarily been on instruction, Newbery revised his predecessor's writing to add amusement to enhance the narrative. Much of the natural history writing for children for the next several decades would use similar narrative strategies: the conversational personality of the narrator, the heavy emphasis on dialogue as the main method of dispensing information, and the various digressions to interrupt the large amount of factual information (Pickering 80-84). To explain basic scientific principles, Tom Telescope uses everyday objects such as a spinning top for motion and a chaise wheel and brake for friction.

Demonstrations with familiar objects such as toys "make the wonders of nature immediately available to the child" (Secord 133).

In this atmosphere of promoting useful knowledge for children, a competing genre--fantasy--was encountering increasing resistance from rationalists who saw no place for it in children's literature. One type of fantasy that was particularly frowned upon was the fairy tale. Fairy tales from English folklore had largely been kept alive through oral tradition, and then later via the chapbook industry, and were thus less easy to target with criticism than written tales for middle- and upper-class children. A greater concern existed regarding fairy tale invasions from the Continent. In the late seventeenth century court of Louis XIV, fairy tales were in high favor, with ladies such as the Comtesse d'Aulnoy (1650-1705) often composing tales for entertainment. The best known and most influential source of French fairy tales, however, was Charles Perrault (1628-1703) and his Histoires ou Contes du temps passé. Avec des moralitez. Perrault, a retired royal official, collected and edited several of the fashionable fairy tales circulating among the literary salons of Paris. Published in 1697 with the first English translation in 1729, his

eight tales included the first written versions of such popular bedtime stories as “Sleeping Beauty,” “Little Red Riding Hood,” “Bluebeard,” “Puss-in-Boots,” and “Cinderella.” The frontispiece of Perrault’s original edition pictures an old woman telling stories to a group of children, with the inscription Contes de ma mere l’oye (“Tales of mother goose”), a French folk expression roughly equivalent to old wives tales.

By the 1780s, many moralist writers saw fantasy, and particularly the fairy tale, as a threat to children’s moral and spiritual health. Fantasy came under attack from two sides: “the rationalist school of education. . .and the Christian moralist critique of children’s fiction” (Richardson 113). In opposing fairy tales, writers as varied as Anna Letitia Barbauld (1743-1825), John Aikin (1747-1822), Richard Edgeworth (1747-1817) and his daughter Maria (1767-1849), Sarah Trimmer (1741-1810), and Hannah More (1745-1833) shared an ideal educational view of alert, independent, socially-minded young people, learning from experience, and informed by strong moral values.

Sarah Trimmer, for example, recognized the inadequacies of contemporary children’s literature while educating her own twelve children. Alarmed at the number of

morally inappropriate books for children, she established the journal The Guardian of Education[3] (1802-06) in which she provided orthodox judgments in her reviews of contemporary books. Trimmer also contributed directly to the growing body of children's works with An Easy Introduction to the Knowledge of Nature (1780), Easy Lessons for Young Children (c. 1790), Fabulous Histories: Designed for the Instruction of Children, respecting their Treatment of Animals (1786). The last one, later known by the shorter title The History of the Robins, recounts the adventures of the robins Pecksy, Flapsy, Robin, and Dick. The story of robins serves as an allegory of human family and proper behavior through lessons about charity, faith, kindness, and greed. Her goal was to teach children to behave with Christian benevolence toward all animals while learning their own place in the natural world. She advocated teaching natural history, for it "is replete with amusement and instruction. It leads the mind to contemplate the perfections of the Supreme Being, and also furnishes a variety of useful hints for the conduct of human affairs" (qtd. in Avery 39). Only loosely considered a natural history work, Trimmer's book aimed not to build a systematic rational structure of scientific knowledge but

to create a sense of awe at Creation. Trimmer states in the preface that the whole point of science is “to lead to knowledge of the Great Creator and the study of his works” (39). She urges children to continue to increase their knowledge of God by reading both of His books: the Bible and Nature.

While many of these writers disagreed among themselves regarding the approach to and the degree of emphasis on Christian morality, they shared Locke’s disapproval of the irrational, particularly targeting the fairy tale which was seen as frivolous and deceptive: would children who read fairy tales ever learn to distinguish between truth and fiction? Would not fantasy be a waste of time when so much factual knowledge needed to be learned? In a time when the reading of fiction (novels) was often condemned as the consumption of falsehoods, such fantasies were seen neither as useful nor as educational and could even be morally corruptive. In their defense, the Christian moralist writers did not restrict themselves to lecturing on religious conduct; they often instructed child readers in progressive issues of their day: kindness to animals, the anti-slavery movement, charity toward unfortunates, and the Sunday School movement. Their distrust of fantasy was as

much based on its perceived uselessness as on its irrational nature.

By the end of the eighteenth century, fairy tales, thus seen as a threat to the moral and social order,[4] were often forced underground to reappear in cheap, poorly-made chapbooks popular with the lower classes. These penny books were composed of up to twenty-four pages, often including crudely printed woodcuts. Surprisingly, this banishment, despite the best efforts of many moralists, became the key to the survival of fantasy as the fairy tales "stepped sideways, out of the mainstream of legitimate, suitable moral literature and into the 'Other World' of the chapbook, in the process becoming universally available" (Watson 17). While reputable mainstream book publishers concentrated their attentions on the middle and upper class readerships, chapbook publishers knew what the lower classes, both young and old, wanted. They provided numerous chapbook editions of Perrault's tales as well as versions of such English favorites as Robin Hood, Dick Whittington, and Tom Thumb. Largely responsible for keeping alive and transmitting fairy tales and folklore, these popular chapbooks also provided a welcome alternative to the heavily didactic and moral tales of Trimmer and her

colleagues. Respectability for fairy tales, however, had to wait until the Romantic movement asserted the value of imagination and fantasy, to be discussed later in this chapter.

Even with such negative mainstream views and frequent attempts at suppression, however, fantasy was too ingrained in the reading culture to vanish entirely (Richardson 113). Unable to suppress fantasy completely, mainstream writers of moral tales therefore often adapted or revised fantasy for their own purposes (Sandner 25-26), creating what Patricia Smith terms “didactic fantasy” (39). Realistic tales could use elements of fantasy as long as the stories were still primarily concerned with guiding children to useful and moral lives. One particularly popular genre in the 1780s was the fictional biography of animals or even inanimate objects. Fictional biographies appealed to children’s love of novelty, and were seen by adults as safer than “novels” because these works were psychologically truer than novels, and certainly more rational than fairy tales that violate laws of probability. Beyond the addition of anthropomorphic characteristics, fictional biographies unfold relatively realistically. Usually prefaced with the conventional disclaimer — “only

make-believe" — these tales increased in popularity throughout the latter part of the eighteenth century and include such titles as The History and Adventures of an Atom (1749); Chrysal; or the Adventures of a Guinea (1760); The Adventures of a Bank-Note (1770-1771); The Adventures of a Hackney Coach (ca. 1780), The Adventures of a Rupee (ca. 1780s), and The Adventures of a Silver Penny (1790). Among the earliest gender-specific children's books are The Adventures of a Pincushion (1784), a story for girls by Mary Ann Kilner (1753-1831), and her corresponding story for boys, Memoirs of a Peg-Top (c. 1783). Her sister-in-law, Dorothy Kilner (1755-1836), was equally known in this period for her animal biography The Perambulations of a Mouse (1783).

Under the authority of the middle-class moralist writers of the 1780s and 1790s, fantasy in children's works, when present at all, was often downplayed or moralized to insure that the primary purpose was to instruct — either in moral conduct or in factual knowledge. Science and practical matters, along with the building of character, were considered to be more suitable subjects than the violent myths and fairy tales of the past.

This emphasis on practical instruction can particularly be seen in the writings of Richard and Maria Edgeworth. They saw interaction with children as an opportunity for instruction in Practical Education (1798) and Early Lessons (1814). Richard Edgeworth, in the preface to the latter, echoes Rousseau by declaring that fictions about direct experience of the world with active child protagonists would be the most effective educational approach: "Action! Action! Whether in morals or science, the thing to be taught should seem to arise from the circumstance, in which the little persons of the drama are placed" (qtd. in Richardson 132). The Edgeworths felt that the reader's interest must be held by characters with whom it is possible to sympathize, and by familiar settings into which the reader might easily imagine him or herself.

Although the Edgeworths did not introduce religion in their writings because they felt religious doctrine might cause too much dissent and diminish the practical knowledge they wished to convey, many popular natural history books during the first two decades of the nineteenth century were written to help readers "see the evidence of God's existence and attributes in the natural organisms around them" (Barber 73). Natural history would not only convey

the practical basics of science but would also provide didactic opportunities to teach lessons of piety, duty, and hard work.

In fact, many natural history authors made at least some mention of the importance of studying nature as God's creation, and often the explicitly stated reason for writing the book was to instill in children an appreciation of God's handiwork. Popular accounts of natural history -- both for children and for adults -- based their narratives on natural theology due to the immense influence of William Paley and his Natural Theology; or, Evidences of the Existence and Attributes of the Deity (1802). With its roots in eighteenth-century rationalism, natural theology promoted an intimate, even complementary, relationship between religious faith and science.

Beyond giving actual descriptions of the natural world, these natural history books for children were designed to point to morals, give religious instruction, or indicate correct social behavior. Studying nature was a means of getting closer to God, but scientific facts were often secondary to the illustration of God's wisdom and of man's role on earth. Priscilla Wakefield, for instance, in Domestic Recreations; or, Dialogues Illustrative of Natural

and Scientific Subjects (1805) explains that "the curious phenomena that nature presents, is [sic] one of the most rational entertainments we can enjoy: it is easy to be procured; always at hand; and, to a certain degree, lies within the reach of every creature who has the perfect use of his senses, and is capable of attention" (qtd. in Gates, "Retelling" 290). The descriptive focus of natural history allowed writers to record dutifully the empirical details of natural phenomena in order to create a sense of wonder and reverence for the unified, rational and orderly work of creation. Nature was evidence of the divine for these writers. Anna Letitia Barbauld, the Unitarian author of the six-volume Evenings at Home (1793) with her brother John Aikin, "attempted to awaken [children's] thoughts of God in an imaginative way" (qtd. in Thwaite 57). In her earlier Lessons for Children (1778-79), reprinted for over a century, Barbauld emphasizes man's place in God's creation by teaching children to base their superiority to animals on their ability to read: "I never saw a little dog or cat learn to read. But little boys can learn. If you do not learn, Charles, you are not good for half so much as Puss. You had better be drowned" (qtd. in Richardson, Literature 133). Even a reading primer with the practical purpose of

teaching a child the ABC's must illustrate the reader's relationship with nature and with God. Consequently, it is not surprising that many children's writers in the first few decades of the nineteenth century continued to favor natural history as an acceptable subject, one that was morally uplifting and socially useful for children to read.

Regarding natural history for children, the period from approximately 1800 to 1840 marks the growth of what Alan Rauch terms "scientific didacticism," or the use of "scientific subjects for moral and religious instruction of children" ("A World of Faith" 13). The absence of science teaching from most school curricula (and certainly most primary school curricula) meant that, until the last decades of the century, the majority of children gained their knowledge about nature from reading done in the home. This new genre, though never straying far from its moral purpose, would evolve during the nineteenth century as writers found ways to instruct children in science while subtly advocating particular views of nature ranging from natural theology to natural selection. Nature books introduced a sense of wonder and reverence for the work of creation, while at the same time using the study of nature as a rational amusement.

While the main thrust of this chapter has been aimed at the child reader, it is also important to note that many of the natural history works for children were often simultaneously aimed at other marginalized groups such as women and working class men, as well as at the parents of the child readers. Many of the narrative strategies mentioned in my discussion of popularizers of natural history were as equally effective with these other receptive yet uninformed audiences as they were with children. Most popular science works for adults, until the middle years of the nineteenth century, were written for educated readers. Although working-class readers were often compared to children in their mental abilities, it was not until the 1830s and 1840s that there began to be some recognition of the need for simple introductory works for adults with limited educational opportunities (Fyfe xii).

In addition to a dramatic growth in a reading public that would continue throughout the nineteenth century,[5] cheap educational publishing appeared that could be mass produced and efficiently distributed.[6] Groups such as the Society for the Diffusion of Useful Knowledge[7] (SDUK) hoped their publications for the lower classes would counter any radical presses that might threaten the religious, social,

and political order. Penny weekly magazines, such as Chambers's Edinburgh Journal and the SDUK's Penny Magazine, also appeared in the 1830s, again making cheap reading material accessible to a growing reading audience.

To instill an appreciation of the natural world in readers, many natural history works favored the dialogue[8] as the most effective approach to educate their audience, since it mirrored the question and answer format already familiar to many children from their catechism. The dialogue form, with its several variations — conversations, catechisms, letters — became the standard narrative form for many popular natural history works during the first two decades of the nineteenth century, including Samuel Parkes's Chemical Catechism (1806), William Mavor's The Catechism of Health (1809), and Jeremiah Joyce's Scientific Dialogues (1800-1815). As Greg Myers has pointed out, scientific dialogues differ from traditional Platonic dialogues in that characters do not represent opposing views on an issue; instead they represent ignorance and knowledge: "the learner who knows nothing, and the teacher who knows everything" ("Science" 174). The catechism format, in particular, reinforced "religious overtones" in works whose content could be seen as largely secular

(Rauch, "A World of Faith" 15). Using the pseudonym David Blair, Sir Richard Phillips, for example, balances the secular with the religious in The First Catechism for Children (1818):

> Q. What is the Moon?
> A. The moon is a globe like the earth, and is two thousand miles in diameter.
> Q. What is the use of it?
> A. It is probably peopled like the earth, but it was designed by the All Wise Creator to enlighten our earth when the sun is set. (56-57)

The anthropocentrism of the answer to the second question even eclipses the speculation about moon inhabitants. Humankind must not forget our importance in relation to the rest of Creation.

Although some works may have seemed primarily a collection of questions with answers to memorize, the more popular texts for children often used a fictional narrative frame. One of the most popular and most credible of these natural history dialogues is Jane Marcet's Conversations on Chemistry, Intended More Especially for the Female Sex[9] (1805), which sold 160,000 copies in its day and went through sixteen editions. This work stemmed from Marcet's own inability to initially follow Humphry Davy's public lectures at the Royal Institution. The rapidity of his

demonstrations overwhelmed her, and she had to work through his points with actual conversations she had with friends. Marcet concluded that "familiar conversation was, in studies of this kind, a most successful source of information; and more especially to the female sex, whose education is seldom calculated to prepare their minds for abstract ideas, or scientific language" (v). To frame her book, Marcet creates a teacher, Mrs. Bryan, and her pupils Emily and Caroline. The pattern of the teacher quizzing and sometimes lecturing her students and the students responding and querying the teacher allows Marcet to review for readers many of the discoveries of her time.

In popularizing chemistry, Marcet has subverted gendered science, establishing the beginnings of a "female tradition in women's popularizations" (Gates, "Retelling" 292). Gendered popular science, as Greg Myers notes, results from both "a matter of practices" and "a matter of form" ("Fictionality" 46). Women observe; men experiment. Botany, primarily concerned with identification and classification, is a feminine science; chemistry, however, with its complex demonstrations and experiments is masculine. Dialogues, letters, and tales are feminine forms of popularization; treatises, lectures, and demonstrations

are masculine. But by creating a narrative frame for the already feminine genre of the conversation, Marcet not only makes a complex subject more attractive to its audience but it also allows her to don the guise of authority about a masculine science.

Another popularizer who began to experiment with narrative formats was Jane Loudon (1807-1858), whose husband John was a well-known and well-traveled horticulturalist. She was the author of several books on botany, including The Ladies Flower Garden of Ornamental Annuals (1840) and British Wild Flowers (1846), but these were reference works filled with straightforward botanical descriptions designed to introduce young women to the world of gardens. In 1840, however, Loudon offered The Young Naturalist's Journey; or, The Travels of Agnes Merton and her Mama as a different form of the dialogue. Here, Loudon uses a young girl's and her mother's journey throughout England as the framework for an anecdotal account of encounters with natural history. The two travelers meet and question various people about their knowledge of animals and nature. For Loudon, "Natural History has always appeared to me a particularly suitable study for young people; as it excites the youthful mind to the

contemplation of the infinite wisdom which has been shown in making all creatures form one vast whole; every part of which is in some way connected with, and dependent on, the rest. Nothing has been made in vain" (466). The "journey" motif allows readers to experience not only natural history but also the geography of the wider world. Unfortunately, these conversations and dialogues, even with the narrative frames, were still often more of a monologue on the part of the adult, with the child character serving only as a prompter asking appropriate questions.

Interestingly enough, in the first two decades of the nineteenth century, at the same time greater emphasis was being placed on natural history and elementary science for children, the resistance to fantasy was beginning to fade. Despite Lucy Aikin's overly confident assertion in her preface to Poetry for Children (1803) that fairy tales were no longer a danger to children since the "'wand of reason' had banished 'dragons and fairies, giants and witches' from the nursery" (qtd. in Watson 16), an appreciation of the imaginative power of fantasy was resurfacing among many Romantic writers. In a letter to his friend Thomas Poole on October 16, 1797, Samuel Taylor Coleridge (1772-1834) defends fairy tales for children, basing his judgment on

his own experiences. He particularly recognizes how those who rely solely on empirical knowledge have an incomplete understanding of the world:

> Those who have been led to the same truths step by step thro' the constant testimony of their senses, seem to me to want a sense which I possess -- They contemplate nothing but parts and all parts are necessarily little -- and the Universe to them is but a mass of little things. . . .I have known some who have been rationally educated, as it is styled. They were marked by a microscopic acuteness; but when they looked at great things, all became a blank & they say nothing -- and denied (very logically) that any thing could be seen: and uniformly put the negation of a power for the possession of a power --& called the want of imagination Judgment, & the never being moved to Rapture Philosophy. (32)

Coleridge's defense of the popular fairy tale echoes the primacy most Romantic writers placed on imagination. According to David Sandner, "Romanticism's new view of the imagination as a positive creative force. . .and, especially, its new view of childhood as sacred, all promoted the legitimacy of fantasy for children" (8). Fairy tales, by engaging the imagination, allow children to connect with a world more real than the material one around them, a world of the spirit.

One of the most oft-quoted passages expressing the Romantic impatience with overly didactic writers comes from Charles Lamb. In 1802, in a letter to Coleridge, Lamb

condemns writers such as Barbauld and Trimmer who he believed sanitized their tales, suppressing imagination to underscore moral teachings. Lamb asks, "Is there no possibility of averting this sore evil? Think what you would have been now, if instead of being fed with Tales and old wives fables in childhood, you had been crammed with Geography & Natural History? Damn them. I mean the cursed Barbauld crew, those Blights and Blasts of all that is Human in man and child" (qtd. in Richardson, Literature 56). For the Romantics, the fairy tale may even be more "moral" than the moral tale because it leads to spiritual truths upon which the morality is based (34).

While Coleridge and Lamb expressed their concerns privately, a commonly accepted benchmark for the public revival of interest in fantasy is the appearance in 1823 of Jacob and Wilhelm Grimm's German folktales, Kinder-und Hausmärchen. First translated by Edgar Taylor as German Popular Stories and illustrated by George Cruikshank, these tales gave impetus to the resurgence of interest in folk tales in England. In the introduction to his two-volume translation, Taylor laments that "philosophy is made the companion of the nursery: we have lisping chemists and leading-string mathematicians; this is the age of reason,

not of imagination; and the loveliest dreams of fairy innocence are considered as vain and frivolous. . .Our imagination is surely as susceptible of improvement by exercise, as our judgment or our memory" (xvii). For Taylor, the emphasis on science and reason in children's writing had caused young people's imaginations to atrophy.

Unfortunately, as Locke had warned, an unfettered imagination could potentially have as many ill-effects on children as strict moralist doctrines. As David Sandner asserts, while the fairy tale exhibited the Romantic endorsement of the imagination, "the cherishing of childhood innocence meant the forsaking of adult understanding" (15). Fairy tales, for example, were often not models of good behavior. The original versions of many fairy tales were violent, cruel, and bawdy with countless instances of incest, sex, mutilation, and cannibalism. In Charles Perrault's "Little Red Riding Hood," for example, the heroine is eaten at the end; in the Grimms' "Cinderella," birds peck out the eyes of the stepsisters as punishment for their wickedness. English editions were often edited to be more suitable to their child audience partly for moral purposes but also to preserve the growing view of childhood as a state of innocence.

Additional fairy tale imports arrived in England in 1846 with Mary Howitt's translation of the stories of Hans Christian Andersen (1805-1875), titled Wonderful Stories for Children. Enduring tales such as "The Princess and the Pea" and "The Little Mermaid" now appeared on nursery bookshelves. Unlike the Grimms' fairytales, Andersen's stories, however, are not retellings of folklore. Though often drawing from traditional Danish folklore, Andersen composed original literary fairytales.

Andersen's influence and the increasing popularity of fairytales in general prompted several major Victorian writers to create their own original tales, in several cases addressing their works to a particular real-life child: John Ruskin's The King of the Golden River (1841; 1851) for a twelve-year-old Effie Gray; Charles Kingsley's The Water-Babies (1862-63) for his son Grenville; and Lewis Carroll's Alice in Wonderland (1865) for Alice Liddell. U.C. Knoepflmacher argues that the specific child in each of these cases is a "private child-auditor who encouraged each storyteller to release childhood imaginings embedded within an adult logic, to reclaim the threatened child within" (500). Reflecting the author's nostalgia, the fantasy tale also beckons to the adult reader who wants to

travel back to the realm of magic and possibilities of childhood.

By the 1840s, as Lewis Roberts suggests, Victorian writers such as those mentioned above, had inherited two separate, though not incompatible, notions of childhood. The romantic ideal of the innate innocence of childhood and the evangelical model of the child's need for moral discipline "helped to position childhood itself as a period of great spiritual and sentimental significance" (354). Reading awakened children "to an awareness of their individuality and developed their emotional and intellectual faculties" (356). Children's literature was not to just impart instruction or amusement -- but to promote growth, both intellectual and spiritual. Childhood's innocence and the concurrent loss in adults caused many writers to be protective, even nostalgic, in their writings for children, often privileging childhood as "a prelapsarian phase of life" (356). Their Romantic idealizations of childhood argue that the child, who is closer to our divine origins, can see more clearly than the adult; therefore, "the child is valued for something the adult has lost and can only regain through the child" (Cosslett, Talking Animals 94).

These two views of childhood come together in Ruskin's The King of the Golden River (1841; 1851), which is "the only example of an evangelical fairy tale in Victorian English literature" (Michalson 43). The child hero Gluck, innocent and honest, endures harsh treatment from his older brothers in the Treasure Valley. Despite his ill-treatment, though, Gluck's spirit remains virtuous and compassionate. When the older brothers' farm is cursed due to their wickedness toward a stranger (the King of the river) and then they are eventually turned to stone for their greed and selfishness, it is Gluck who passes the moral test, sacrificing his chance at riches to save a dog dying of thirst. Childhood innocence has persevered and restores good fortune: "And thus the Treasure Valley became a garden again, and the inheritance, which was lost by cruelty, was regained by love" (36). Ruskin's tale expresses the Victorian "desire to separate childhood from adulthood and to preserve a space free from adult greed and power in which the romantic child can live forever young and innocent" (Roberts 359). Critics have often neglected Ruskin's story because "the tale subverts two antithetical genres, the fantasy-oriented fairy tale and the evangelical moral tale, by combining them" (344). Yet what critics fail

to realize is that this literary fairy tale has merged the two genres to accurately reflect the nineteenth-century concept of the child.

With the development of the literary fairy tale in England, we have now arrived at approximately 1850, the beginning years of the period under study. Throughout this chapter I have illustrated the relative emphasis that children's writers in the eighteenth and early nineteenth centuries had given to natural history, religion, and fantasy. Natural history and religion seemed likely partners, given the desire of so many writers to reveal nature as God's handiwork. The moralists had selectively appropriated fantasy for their tales of anthropomorphic talking animals while later writers often transformed the rehabilitated fairy tale into didactic opportunities. The two genres, however, that had not merged consistently were fantasy and natural history, and I suggest that until mid-century, there was no need for such a merger. At this time, however, several factors appeared that pressured natural history writers to re-examine their approaches.

Children's literature, recognizing the importance of feelings as well as reason and gradually relaxing didacticism because it was less certain of dogmas, reflects

implicitly and explicitly what was happening in the world beyond children's books. As the nineteenth century progressed, England saw rapid economic and technological advancements and a concurrent growth of the middle class. Despite a definite sense of overall industrial progress for the nation, the growing towns and the appalling conditions in them, the abuses of the factory-system, the decline in agriculture, and the inadequacies of public education all produced tensions and agitation. In the face of recurring public outbursts such as the rural "Swing Riots" of the 1820s, the calls for parliamentary reform in the 1830s, the growth of the Chartist movement, and the protests calling for the Repeal of the Corn Laws in the 1840s, the virtues of utilitarianism seemed inadequate.

One of the most prominent critics of the utilitarian philosophy often preached to children at the expense of the imagination was Charles Dickens (1812-1870). When George Cruikshank (1792-1878) revised the fairy tale “Cinderella and the Glass Slipper” in order to comment on the evils of alcohol, Dickens was outraged. He publicly attacks such moral sanitizing of fairy tales with his essay “Frauds on the Fairies,” published in the October 1853 issue of Household Words. Dickens condemns Cruikshank’s moralistic

revisions and advocates that fairy tales and other such fantastic works of the imagination must be kept pure and faithful to their origins, particularly in “an utilitarian age, of all other times” (111). He credits his childhood nurse with keeping his imagination alive through her tales. These “nurseries of fancy,” as Dickens termed them, had risen in stature from the eighteenth century when they had either been driven underground to chapbooks for the poor or had been commandeered by writers of moral and religious tales.

In addition to the growing resistance to utilitarianism, a gradual shift occurred within the public from religious to secular ways of seeing the natural world. Studies in geology, biology, and chemistry were often headed in materialistic and naturalistic directions “that made the attempt to reconcile science with revelation and theology more difficult” (Lightman, Victorian Popularizers 40). Many of the new scientific theories, particularly those in geology and biology, contributed to a growing crisis of faith. In 1830-33, for instance, Sir Charles Lyell (1797-1875) published his three-volume Principles of Geology in which he argues that uniform and constant laws had been and were still transforming the surface of the

earth. Lyell's work and subsequent geological studies also revealed a planet on a much vaster scale of time than previously imagined, a fact that directly challenged any literal reading of Biblical scripture. In 1851, John Ruskin (1819-1900) expressed the loss of Biblical authority felt by many in society as science gradually altered their world view: "If only the Geologists would let me alone, I could do very well, but those dreadful hammers! I hear the clink of them at the end of every cadence of the Bible verses" (qtd. in Klaver 26). Ruskin wishes to escape the sound of the geologist's hammer not because it wasn't true but because of what it meant for how we view the world and our own place in it. Charles Darwin's On the Origin of Species (1859), building upon Lyell's work in geology, would also raise the specter that science might, after all, be at odds with belief. Although evolutionary theories of the history of life were already familiar enough by 1859, the notion of natural selection as the mechanism of evolution was new and disturbing. Scientific naturalists such as T.H. Huxley (1825-1895), John Tyndall (1820-1893), and Herbert Spencer (1820-1903) advocated an explanation of nature as the operation of physical laws, without any reference to supernatural causes.

Religious writers who were firmly grounded in natural history had always been challenged by the advancements in science -- did they forego their religious beliefs and maintain secular accounts or did they mix science and religion? For some writers, religion always gained sway. Charles Kingsley notes in Glaucus (1855) that some natural history writers had "tried to make a hollow compromise between fact and the Bible, by twisting facts just enough to make them fit the fancied meaning of the Bible, and the Bible just enough to make it fit the fancied meaning of the facts" (13). Those writers, however, who had a more serious background in natural history -- such as those who are the focus of this dissertation -- could not compromise scientific facts, but they also could not compromise their religious beliefs. Instead, they discovered new ways in which to teach natural history while at the same time advocating their particular views of the natural world.

Thus, we see in the second half of the nineteenth century writers such as Margaret Gatty, Charles Kingsley, and Arabella Buckley emphasizing "the teleological, aesthetic, moral, and divine quality of nature" (Lightman, "Popularizing" 206) as they struggle to either refashion or refute the growing tide of scientific naturalism. The

preferred formats of earlier writers -- the catechisms and the conversations -- had already begun to seem lifeless and unimaginative to the reading public. Gatty, for example, believed Jane Marcet to be dry and boring, and even wrote, "I believe I hate Mrs. Marcet" (qtd. in Lightman, Victorian Popularizers 99). All three of these writers had strong religious beliefs, ones that particularly color their views of the natural world. But they actively use their various approaches to fantasy to entertain their readers as well as advocate their views about the interrelationship between science and religion.

This brief background to natural history writing and fantasy up to the mid-nineteenth century has been clearly an overview, touching upon representative works that illustrate the parallel journeys of these two genres. Natural history writing for children finds its roots in the Enlightenment ideals of reason and utility, its popularity steadily growing in the modern industrialized age. Fantasy's path has been less direct, often reflecting the shifting values of the predominant ideologies of any given period. Yet by 1850, children's literature had begun drawing freely from both genres as their definitions became more relaxed.

In the next section of this chapter, I focus on natural history writing as a literary genre, outlining its generic characteristics, its role in scientific popularization, and its current status in critical studies.

Natural History as a Literary Genre

As seen in the historical survey of children's literature, natural history in the nineteenth century for many people, not just children, qualified as a "rational amusement." Its pursuit not only offered practical knowledge about nature but also moral benefits since the discoveries of natural history were seen as proof of the wisdom and power of a divine creator. Though natural history draws on the biological and physical sciences, the naturalist, by definition, usually "prefers to observe rather than analyze, enjoys particulars more than abstractions" (Merrill 12). Thousands of Britons of all social classes were amateur natural historians, collecting, describing, and cataloging nature in a series of natural history crazes that swept Britain throughout the nineteenth century. Ferns, shells, birds' eggs, fossils, and beetles -- all captured the public's fascination: "By the middle of the century there was hardly a middle-class drawing room in

the country that did not contain an aquarium, a fern-case, a butterfly cabinet, a seaweed album, a shell collection, so some other evidence of a taste for natural history" (Merrill 13).

All these collectors, however, needed guides to the study of natural history, books that would explain scientific concepts in everyday language and awaken readers to the wonders of the natural world. Although based on scientific detail, natural history writing was a literary construction dependent upon skilled use of narrative and metaphor to capture and maintain readers' interest (Gates, "Revisioning" 170). Lynn Merrill even goes so far as to describe natural history as standing "halfway between science and the arts. Its approach to nature partakes of both. Like science, it notes, identifies, and delineates details; like art, it arranges them in an overall composition, whether that be an illustration, a collection in a cabinet, an essay, or a book" (15). In addition to the natural history texts mentioned in my historical survey, other popular works include The Romance of Natural History (1860-61) and Evenings at the Microscope (1859) by Philip Henry Gosse (1810-1888); The Boy's Playbook of Science (1860) by John Henry Pepper (1821-1900); Common Objects of

the Seashore (1857), Common Objects of the Microscope (1861), and The Romance of Animal Life (1887) by Reverend John George Wood (1827-1889); Other Worlds Than Ours (1870) and Light Science for Leisure Hours (1871) by Anthony Proctor (1837-1888); A Popular History of Astronomy (1885) by Agnes Mary Clerke (1842-1907); Studies in Evolution and Biology (1890) by Alice Bodington (1840-1897); and Wild Nature Won by Kindness (1890) by Eliza Brightwen (1830-1906). Such popularizers of natural history were not simply distillers of scientific information; they often actively promoted, and at times, romanticized, the natural world for a fascinated public.

Despite the modern negative connotations which often equate popularization with dilution or distortion of information, I follow Bernard Lightman's use of the term "popularizers" or its cognate "popularization" because these words "place the questions of authorship, authority, and audience front and center" in any discussion (Victorian Popularizers 10). In this dissertation, I look at writers who saw themselves as intermediaries between the growing professionalization of science and a curious public that was increasingly feeling alienated from the natural world. Their primary audience may have been children, but their

popularizations also informed readers of all ages who were curious about the natural world.

Consequently, the story of the popularization of science is intertwined with the rise of the professional in science. In the first few decades of the nineteenth century, the "caste division between professional and amateur had not yet been invented and the naturalist might be anyone from Darwin down to the lowliest bug-hunter" (Barber 28). The term "popular science" first appeared in the 1820s and 1830s as part of the general transformation in the book trade (Lightman, Victorian Popularizers 18). The scientific language of natural history was largely still comprehensible to the educated segment of the public for the first half of the nineteenth century; scientific specialization had not yet required the dense jargon understandable to only a relatively small number of individuals trained in that discipline. Certainly, well-known works such as Sir Charles Lyell's Principles of Geology (1830-33) and Charles Darwin's On Origin of Species (1859) were accessible to the generally educated upper or upper-middle class public, but a demand still arose for writers who could translate scientific discourse into the vernacular for the large portion of the population who were

not educated. It was vital for writers to avoid technical language, to explain concepts carefully and to provide clear illustrations.

By mid-century, however, rapid technological changes and important scientific discoveries in geology, biology, and astronomy had shaped the Victorians' world, broadening the gap between the layperson and the "men of science." The various branches of natural history gradually developed into specialized scientific fields such as zoology, entomology, and astronomy, each with its own formal scientific society.[10] As the male-dominated scientific community became more professional, it limited the acceptance of all who presented themselves as amateurs or were perceived as amateur-like. To help bridge that growing division between the amateur and professional domains, men and women interested in science, but without formal training, recognized a need for mediators between the specialized, professional scientist and the rapidly growing Victorian reading public interested in the larger religious, moral and social implications of the most recent discoveries (Lightman, "Market" 101).

Until the mid-1990s, historians of science and literary scholars had mostly ignored popularizers of

natural history. The few writers who were studied, such as T.H. Huxley and John Tyndall, were members of the new scientific professions of the late nineteenth century. Huxley and Tyndall popularized science in essays and lectures as part of their concerted effort to separate science from religious thought and establish science's authority in society. Historians have often dismissed popularizations that were not composed by this scientific elite, viewing such writings as merely disseminating "simplified accounts to a passive readership" (Lightman, "Marketing" 100) and often treating natural history "as a defective translation of a primary text" (Myers, "Fictionality" 43). These well-intentioned enthusiasts lacked credibility and reported diluted information without ever creating knowledge themselves. This positivist diffusion model, according to Cooter and Pumfrey,[11] excluded popularizers and their reading audience from the production of knowledge while granting "to scientists the sole possession of genuine scientific knowledge" (Lightman, Victorian Popularizers 14).

In the last fifteen years, however, natural history has begun to be seen as a separate genre from scientific writing, with historians exploring how the popular accounts

of science can be treated as “sophisticated productions of knowledge in their own right” (Lightman, “Marketing” 100). Barbara Gates, in her study Kindred Nature (1998) and her anthology In Nature’s Name (2002), traces Victorian and Edwardian women's engagement with nature as they sought a voice in their culture through various subgenres of natural history writing -- dialogues, conversations, travel writing, fiction, poetry, and essays. Gates has written extensively on women natural history writers. In addition to enabling their audience to grasp basic scientific ideas, these women also found an outlet for commenting on “the larger social, political, and religious significance of scientific theories” (In Nature’s Name 436). Similarly, Bernard Lightman’s recent study, Victorian Popularizers of Science: Designing Nature for New Audiences (2007), examines a number of popularizers in the second half of the nineteenth century, including Grant Allen, Arabella Buckley, Margaret Gatty, David Page, John Henry Pepper, and Anthony Proctor. With an encyclopedic knowledge, he addresses how two main groups of writers, Anglican clergyman and women, addressed specific niches within the popular market for natural history.

To help distinguish the genre of natural history writing from scientific writing in the nineteenth century, several critics, including Gates[12] and Lightman, have borrowed and modified twentieth century terminology, particularly that devised by Greg Myers in his work Writing Biology (1990). Myers, in his study of contemporary scientific discourse, divides science writing into the "narrative of science" and the "narrative of nature." The first category refers to scientific publications that meet the standards of a given discipline and establish the credibility of the author within the scientific community. These works involve experimentation with an emphasis on the results, for the authors are writing for a limited audience of their peers in the field. The latter division, however, includes popular accounts of nature written for as broad an audience as possible, often filled with entertaining anecdotes designed to amuse readers as much as instruct them (Lightman, "The Story of Nature" 5). In the narrative of nature, an "unmediated encounter with nature is detailed, rather than the expertise of the observer" (5). Furthermore, instead of using rhetorical devices such as the present tense and passive voice, which de-emphasize or even deny the narrativity in science writing, the

popularizers of science celebrate the narrative power of their subject and their approach by stressing "the externality of nature to scientific practices" (Myers, Writing Biology 142).

In this section of the chapter, I have shown the growing interest that natural history writing has stimulated in literary studies and have articulated some of the key issues that critics have recently debated. Similarly, the final section focuses on fantasy as a literary genre, reviewing major critical definitions of fantasy. Since fantasy is an operative word in my dissertation, these definitions and how they may or may not apply to Gatty, Kingsley, and Buckley are essential in grounding later discussions of fantasy in individual author chapters.

Fantasy as a Literary Genre

In a 1972 interview, Maurice Sendak, author of the children's book Where the Wild Things Are (1963), describes the relation between fantasy and childhood:

> I believe there is no part of our lives, our adult as well as child life, when we're not fantasizing, but we prefer to relegate fantasy to children, as though it were some tomfoolery only fit for the immature minds of the young. Children

> do live in fantasy and reality; they move back and forth very easily in a way we no longer remember how to do. (qtd. in Haviland 264)

For adults, all children's literature is much like fantasy. It is not so much literature for children as it is literature about childhood, literature describing the world as children might see it and understand it to be. In fact, children's literature is frequently about coming to terms with a world one does not understand -- the world as defined and governed by grownups and not totally familiar or comprehensible to children. Likewise, all fantasy is about worlds one could not possibly have understood before reading the stories that contain them, so both children's literature and fantasy place readers in a position of innocence about the reality they describe, and create the same peculiar relationship between the story and its audience.

The boundaries of any genre must be porous at best, but those of fantasy are particularly amorphous; fantasy's association "with imagination and with desire has made it an area difficult to articulate or to define" (R. Jackson 1). A genre that in its broadest sense could include the fairy tale, the utopia/dystopia, the allegory, the fable, the parable, the myth, the ghost story, and the Gothic,

defies easily set parameters. Lucy Armitt in Theorising the Fantastic (1996) notes that

> Fantasy (at least in its most creative of guises) is, like all other literary modes, fluid, constantly overspilling the very norms it adopts, always looking, not so much for escapism but certainly to escape the constraints that critics like this [she is referring to Kingsley Amis] always and inevitably impose upon it. . . . If we perceive genre as a category that 'contains' (being entirely content-led), then the fact that the fantastic concerns itself with the world of the 'beyond' (beyond the galaxy, beyond the known, beyond the accepted, beyond belief) should immediately alert us to the attendant difficulties it has with coping with limits and limitations. (2-3)

Because of fantasy's elusiveness, critical studies often begin by establishing differences between the mimetic and fantastic traditions. As Kathryn Hume explains, "If one starts with the belief that literature consists of mimesis, one has an automatic bias against manifestations of fantasy. The presence of fantasy is taken to signal a kind of failure" (26). Realism and fantasy, however, are not antithetical modes; they have similar rhetorical goals in that they both desire to reveal truth about the world. "Fantasy is not in opposition to realism," Stephen Pritchett argues, "but is in addition to it" (xiii). Fantasy simply reveals that part of the world that realism cannot directly show. For Christian writers such as those

in this dissertation, “the real world” that we know is every bit as fantastic and wonderful as any fictional creation, since for these writers “the real world” is imbued with the spiritual (Manlove, Modern Fantasy 2).

Because fantasy has been so difficult to classify and describe, numerous critical definitions, some contradictory, exist for the genre. Tzvetan Todorov, in his groundbreaking work The Fantastic: A Structural Approach to a Literary Genre (1973), states that “the very heart of the fantastic” consists of the occurrence of an event in the “real world” which is impossible under the laws of nature governing that world, thus leaving the reader and/or the character with two choices: either view the event as a hallucination or illusion, or accept that there are unknown laws in operation (25). Todorov argues that the fantastic is a realm of hesitation between the natural and supernatural, between belief and unbelief. If the supernatural is accepted and believed, then the text moves into the genre of the marvelous (31). Unfortunately, Todorov’s definition would not include those fantastic works, such as Tolkien’s Lord of the Rings trilogy, that occur entirely within Secondary Worlds.

Similarly, in The Fantastic in Literature (1976), Eric Rabkin argues that "[t]he truly fantastic occurs when the ground rules of a narrative are forced to make a 180 degree reversal, when prevailing perspectives are directly contradicted" (12). This reversal in the text allows us for a time to stand outside the various expectations which comprise our sense of reality and thereby gain perspective:[13] "the very nature of ground rules, how we know things, on what bases we make assumptions, in short, the problem of human knowing infects Fantasies at all levels, in their settings, in their methods, in their characters, in their plots" (37). Rabkin's definition is more inclusive than Todorov's, but it, too, implies that a text only qualifies as fantasy if it exhibits radical changes in perspective. Such a definition would omit many fairy tales and fables, which could be relatively close to our reality.

In the Victorian period in particular, fantasy often reflects the need to create a world too rich and mysterious for the conventions of Victorian realism. In the process of evoking a sustained sense of wonder in the unseen world, fantasy offers a way to explore, undercover of the apparently absurd and irrational, what would most likely be inappropriate, given prevailing social mores. For Rosemary

Jackson, a psychoanalytic critic, fantasy is “a literature of desire, which seeks that which is experienced as absence or loss” (3). She believes “the fantastic traces the unsaid and the unseen of a culture: that which has been silenced, made invisible, covered over and made ‘absent’” (4). Fantasy is subversive by nature, for it focuses on breaking boundaries, representing the unspeakable, and, eventually, “attempting to transform the relations of the imaginary and the symbolic” (91).

Of these three critical views of fantasy -- Todorov’s, Rabkin’s and Jackson’s -- Jackson’s definition with its emphasis on the subversive ability of fantasy applies best to my study. In the guise of playfulness or nonsense, a fantasy writer can entertain and educate child readers, even offering serious commentary on contemporary issues or situations without drawing harsh criticism from adult readers. Adults, particularly parents and teachers, often function as gatekeepers who identify appropriate texts for children. Since children's literature has been marketed to and purchased by adults who, in turn, present it to children, authors and publishers have attempted to produce children's texts that appeal to the desires of the actual adult consumer, if not the child reader of the text.

Although speaking of fairy tales in particular, U.C. Knoepflmacher emphasizes, "the division between the perspectives of the child and the grown-up not only led authors of children's fairy tales to devise fictional structures of considerable sophistication but also resulted in their simultaneous appeal to distinct types of implied readers" (500). Jack Zipes further extends this idea by explaining that children's writers often "had two ideal audiences in mind when they composed their tales -- young middle-class readers whose minds and morals they wanted to influence, and adult middle-class readers whose ideas they wanted to challenge and reform" (Victorian Fairy Tales xi). As I show in the individual author chapters, Gatty, Kingsley, and Buckley compose their respective narrative strategies with this dual audience in mind, knowing that their writing may subtly influence both children and adults.

In this dissertation, I follow a broad definition of fantasy: a fantasy text is a self-coherent narrative that contains one or more elements -- the fantastic -- that is unexplainable by the physical laws of our world. If a story contains magic, supernatural creatures, alternate worlds co-existing with our own, or any other element that is not

possible to explain, it is a fantasy. I incorporate Jackson's ideas about fantasy's subversive ability not just as a generic definition but also as a literary approach that Gatty, Kingsley, and Buckley consciously choose to influence their audiences. Such a flexible definition is necessary because the three writers under discussion -- Margaret Gatty, Charles Kingsley, and Arabella Buckley -- have chosen different modes of fantasy: parables and fairy tales.

These modes of fantasy raise another important issue. Just as definitions differ in fantasy criticism, so does terminology, most notably with the two terms "fantasy" and "fantastic." For some critics, such as Todorov and Jackson, the fantastic refers to the genre and fantasy to the wider mode that also includes science fiction, horror, and gothic. I prefer the opposite usage of the terms endorsed by such critics as Eric Rabkin and Colin Manlove. For them, the fantastic describes the general mode and fantasy refers to the genre in which the fantastic is dominant. In this sense, the degree to which the fantastic is used in a work determines if the work belongs to the fantasy genre. With this distinction in mind, I suggest that Gatty and Kingsley

write fantasy whereas Buckley merely uses a fantastic gloss to highlight the wonders of science.

The major point of commonality among the writers, however, is their attempt to unite the natural and supernatural worlds. They reach "beyond realism to disclose that we do not live entirely in a world of the perceived senses, that we also inhabit an inner world of the mind and spirit where the creative imagination is permanently struggling to expand vision and perception" (Egoff 19). But to reconnect with this spirituality that many adults seemed to have lost in a modern industrial world, each writer incorporates varying degrees of fantasy in their works. For Gatty, the short fable-like parables use anthropomorphized plants and animals to convey allegorically spiritual truths. Kingsley, within the larger expanse of a novel, incorporates several fairy tale elements, including magic, fairies, and a hero on a quest. Buckley has the most empirically grounded text of the three writers. Nonfiction is her foundational genre; she uses fantasy elements merely to remind her readers of the wonder imbued in the natural world around us.

As I show in the individual author chapters, fantasy is an appropriate literary partner for religiously-

motivated natural history writing. The latter's desire to explain the forces at work in the natural world can only be enhanced by fantasy's ability to reveal the invisible world. According to Jack Zipes, "[i]t is through fantasy that we have always sought to make sense of the world, not through reason. Reason matters, but fantasy matters more" ("Why Fantasy" 78). We constantly seek to grasp, explain, and comment on reality through our use of fantasy. For this reason, the Bible and the Grimms fairy tales have become canonical texts; unlike reality, they allegedly open the mysteries of life and reveal ways in which we can "maintain ourselves and our integrity in a conflict-ridden world" (78). Illumination is the common goal of fantasy and of natural history writing. For Gatty, the subject of Chapter Two, natural theology reveals a world that reflects the power and glory of God; her beast fables and parables illustrate moral lessons for humankind through the workings of God's other book -- nature.

Notes

[1] Topsell's work describes each animal emblematically, detailing its practical uses for humankind, and relying as much on folklore as on scientific sources.

[2] Various editions of the Newtonian System appeared for the next eighty years, with nine editions in the eighteenth century alone. Dutch translations appeared in 1768 and 1783, Swedish ones in 1782 and 1786, American editions in 1803 and 1808, and an Italian translation in 1832. For a detailed account of the changes in the various editions as the nineteenth century advanced, see James Secord's "Newton in the Nursery" in History of Science, xxiii (1985), 127-151.

[3] Trimmer's The Guardian of Education (1802-06) was the first successful British periodical devoted to reviewing children's literature, offering child-rearing advice as well as assessments of contemporary educational theories. Trimmer was motivated to publish her conservative periodical by the flood of new children's books in the nineteenth century and by her fear that many of those books might harbor ideas and values from the French Revolution.

[4] See Jack Zipes' Fairy Tales and the Art of Subversion, Breaking the Magic Spell (1985) for an account of fairy tales challenging "the rationalistic purpose and regimentation of life to produce for profits and the expansion of the capitalist industry" (14).

[5] The ratio of literate and illiterate persons in Britain was roughly equal at the end of the 1830s but by the close of the century, illiteracy had fallen to 1 percent (Lightman, Victorian Popularizers 18). For a detailed account of the changing reading public in the first third of the nineteenth century, see William St. Clair's The Reading Nation in the Romantic Period (2004).

[6] See Simon Eliot's Some Patterns and Trends in British Publishing, 1800-1919 (1994). Eliot labels the period from 1830 to 1850 as the distribution revolution, characterized by the introduction of steam-presses and case binding and the development of the railway system.

[7] The Society for the Diffusion of Useful Knowledge, founded in 1826, published inexpensive texts that adapted scientific and technical material for the working class and for middle class readers who might have preferred a self-education.

[8] On the dialogue, see Greg Myers, "Science for Women and Children: The Dialogue of Popular Science in the Nineteenth Century," in John Christie and Sally Shuttleworth (eds.), Nature Transfigured: Science and Literature, 1700-1900, (Manchester University Press, 1989), pp. 171-200.

[9] The English chemist and physicist Michael Faraday (1791-1867), who was self-educated, credits Marcet's Conversations with Chemistry with his own entry into science.

[10] Geological Society of London (1807), Astronomical Society of London (1820), Zoological Society (1826), British Association for the Advancement of Science (1831), Entomological Society of London (1833), Botanical Society of London (1836), Microscopical Society (1839), Chemical Society (1841), British Meterological Society (1850).

[11] See Roger Cooter and Stephen Pumfrey, "Separate Spheres and Public Places: Reflections on the History of Science Popularization and Science in Popular Culture", History of Science, 32 (1994): 237–67 and Jonathan R. Topham, "Rethinking the History of Science Popularization/Popular Science," in F. Papanelopoulou, A. Nieto-Galàn, E. Perdiguero, eds, Popularising Science and Technology in the European Periphery, 1800-2000, Aldershot, Ashgate, 2008.

[12] Gates and Ann Shteir prefer to use the label "narrative of natural history" instead of "narrative of nature." They also suggest that a third category, the narrative of natural theology, exists, particularly among women popularizers in the first half of the nineteenth century.

[13] When the unexpected occurs, we are in the presence of the fantastic. For this reason, Rabkin argues that the presence of the supernatural cannot be the only defining feature of the fantastic, for fairy tales, in particular, are not true "fantasy" since they are so predictable.

Chapter 2

"Speak Unto Them in Parables":

Margaret Gatty and Scientific Theology

> I seem, for my own part, to see the benevolence of the Deity more clearly in the pleasures of very young children, than in any thing in the world.
> William Paley, The Principles of Moral and Political Philosophy (1785)

In 1874, a stained-glass window was erected in St. Mary's, the parish church at Ecclesfield, England. The window depicts Christ delivering his Sermon on the Mount to a crowd of listeners, among whom is "the full-length form and likeness of the lady, who is there commemorated, dressed in a robe similar to that of Christ" (qtd. in Sheffield, Revealing 27). A marble tablet, purchased via subscription from more than a thousand children, resides on the wall over the prayer desk and reads

> In memory of Margaret, wife of the Rev. Alfred Gatty, D.D., Vicar of Ecclesfield, who died the 4th day of Octr., 1873. CHILDREN RISE UP AND CALL HER BLESSED.

Margaret Gatty, to whose memory both the window and tablet were placed, was a devout Christian whose faith guided her complementary careers as a popular Victorian children's writer and as a naturalist. As the scene in the window illustrates, she strove humbly to follow Christ's example in teaching children and to "speak unto them in parables"

about both faith and nature (American Standard Version, Mark 12:1).

Gatty's literary and scientific careers both began mid-century when traditional interpretations of nature were being challenged by the growing scientific materialism that described a universe explicable in terms of constant laws of nature alone.[1] Firmly supporting science in terms of what can be observed and described, Gatty believed that science offers the means for appreciating the beauty and design of God's works. Indeed, the processes of nature demonstrate the wisdom, power, and goodness of God. To this end, Gatty was dedicated to her child readers' spiritual as well as intellectual improvement, writing "deceptively simple stories that taught human beings about the natural world, themselves, and their soul" (Sheffield, "Introduction," Science for Children Series, vi).

In this chapter, I first discuss Gatty's life and career, particularly focusing on her role as an amateur naturalist and on her entry into the literary world. The last section of the chapter analyzes Gatty's best-known natural history writing for children, Parables from Nature, in which she uses the parable form in effectively combining science, religion, and fantasy to emphasize how nature is intertwined with moral and spiritual issues.

Seaweeds and Story-Telling

In addition to Gatty's own correspondence and diaries,[2] our knowledge of her life comes from two main sources. Gatty had left instructions that no one was to write her biography after her death, saying to her family, "Let us pray to be preserved from the insincerity of biographical memoirs!" (qtd. in Maxwell 14). Despite this injunction, however, her eldest daughter, Juliana Horatia Ewing, published a brief memoir of her mother in the 1874 Christmas volume of Aunt Judy's Magazine and an expanded version in the 1885 edition of Parables from Nature. Ewing felt that "it might seem ungracious to withhold so much information about her [Gatty's] own mental training and processes of work" from her mother's large numbers of readers and correspondents (ii). Describing Gatty's self-sacrificing nature, Ewing's memorial honors a mother whose "life experiences were lived as lessons to be learned" (Katz 26). The only full-length biography of Gatty, titled Mrs. Gatty and Mrs. Ewing,[3] was not written until 1949 by her granddaughter Christabel Maxwell, who relied on Gatty's letters and anecdotes from her mother, Undine, and other close relatives. Ewing's and Maxwell's familial perspectives and Gatty's own correspondence reveal glimpses into the private life and thoughts of an independent

thinker who, within the constraints of her roles as a Victorian wife and mother, found creative outlets in writing and in natural history.

Drawing on these biographical materials, Suzanne Le-May Sheffield has written the leading critical study of Gatty's natural history writing in Revealing New Worlds (2001). Only approximately one-third of Sheffield's work, however, discusses Gatty. The rest of the book covers two other Victorian women naturalists -- Marianne North (1830-1890) and Eleanor Anne Ormerod (1828-1901). Analyzing Gatty's correspondence and diaries as insight into her private thoughts, Sheffield's study reveals a woman "mired completely in the social conventions of her time" and "unable to completely reconcile her ambitions, desires and conflicts with the serene façade of womanly assurance her written work depicts" (68). While I agree with Sheffield that Gatty's intelligent and inquisitive nature often conflicted with the gender norms for Victorian women, I suggest in this chapter that Gatty uses her role as a natural history popularizer to participate in various intellectual discussions of her time without directly violating any social conventions.

Gatty led a life that, according to Wendy Katz, "was unreservedly conservative and profoundly religious, which

is not to say that it was necessarily conventional" (1-2). Born in 1809 in Burnham, Essex, Gatty was two when her mother died. She and her sister, Horatia, were raised by their father, the Rev. Alexander Scott. Largely self-educated by a well-stocked library, Gatty learned several languages, translated German and Italian poetry, and sketched avidly. In 1839, she married the clergyman Alfred Gatty, who was presented with the living of Ecclesfield in Yorkshire for fourteen years.[4] Gatty's early married life was quite domestic. As the mother of ten children, eight of whom survived to adulthood, her activities revolved around her family and, as the duties of a vicar's wife demanded, her parish.

Her fascination with natural history did not emerge until middle age and quite serendipitously at that. In 1848, after the birth of her seventh child, Gatty had a serious breakdown in her health and was advised to leave the cold climate of Ecclesfield and recuperate at the seaside town of Hastings, where she spent five months with her eldest son. During her lengthy convalescence, she became bored until a local doctor loaned her a book on seaweeds, Phycologia Britannica (1846) written by Dr. William H. Harvey, Professor of Botany at Dublin University. She enthusiastically threw herself into this

new, seemingly mundane topic, an act that was typical of many men and women during the mid-century natural history crazes. As Lynn Barber explains, the Victorian public's natural history fascination moved successively from seaweeds to ferns to sea-anemones in the 1840s and 1850s (13). Gatty's pursuit of seaweed allowed her an outlet for her inquisitive mind and an occasional respite from household and parish duties.

Gatty does not record any direct account of her experience at Hastings, but in a later children's story titled "The Dull Watering Place" as part of The Human Face Divine, and Other Tales (1860), she relates a largely autobiographical tale of a woman named Margaret and her niece, Eleanor, who are visiting Hastings. In this story, friends have warned Eleanor about the dullness of the seaside resort. Aunt Margaret, however, conducts her on a tour of the beach below the town, away from the crowds and fashionable places, where one finds oneself in a "different world" (161). When Eleanor grudgingly admits at first that at least the seashells are beautiful, Aunt Margaret good-naturedly lectures her:

> 'So are sea-weeds and zoophytes, Eleanor; as, indeed, is everything which God created and made, the small as well as the great. Indeed, for one reason the small more remarkably so than the great, because it fills the mind with a kind of wondering awe to learn that things and beings

> invisible to any human eyes, are formed and created with the same exquisite beauty and contrivance as those larger ones, which seem more particularly adapted to adorn man's world—the world revealed to his senses. . .your tastes for natural history are at a particularly low ebb when you can like nothing but denaturalized shells, pretty as they are!' (167-68)

Aunt Margaret's views reflect those of Gatty; in her work as a naturalist and as a writer, she continually emphasizes the potential of nature, particularly marine life, to inspire "wondering awe."

After her "awakening" at Hastings, her lifelong passion was for the collection and classification of seaweeds. On her subsequent seaside visits, Gatty would collect specimens, note them in her diary, and often bring home seaweed samples, shells, rocks, and bottles of seawater. Gatty -- wife, mother, and naturalist -- had become fascinated with the sea and its inhabitants, even prompting her daughter Julianna to compose a lighthearted poem, "At Home and at Sea — A Ballad" about her mother's new interest:

> O! is it weed or fish or floating hair?
> A zoophyte so rare,
> Or but a lump of hair,
> My raptured eyeballs see?
> Were ever pools so deep or day so fair --
> There's nothing like the sea!
> (qtd. in Shteir 185)

Despite such lighthearted humor, Gatty's sudden enthusiasm for seaweeds indicates an intelligent, curious, and

appreciative mind. Later in life, she attempts to describe her initial and subsequent passion regarding scientific study to her eldest son who was showing interest in archeological pursuits:

> Even I who feel it, can give no reason for it [her fascination with natural history]. I can sit and wonder at myself at my age, and feeling my condition anything but a cheerful one, with but small hope of the restoration they talk of; I say I sit and wonder at myself for being able to be so carried away with excitement and delight over finding or tracing a seaweed! But when I leave off speculating and go back to the seaweeds, the feeling is just as strong as if I had never discovered its folly by reasoning. (qtd. in Maxwell 92)

As mundane as seaweeds might seem to be, Gatty has discovered their ability to reinvigorate her.

Desiring to learn all she could about seaweed and other marine-life, Gatty gained access to costly titles in marine botany by a fortuitous occurrence. In 1851, three years after her stay at Hastings, Gatty "took to writing Fairy Tales for the children" during an extended illness when she was confined to the sofa (qtd. in Maxwell 104). Her family was so delighted by her stories that her husband suggested sending them to a London publisher, who agreed to publish a collection of three stories as her first foray into children's fantasy, The Fairy Godmothers and Other Tales (1851). The titular tale illustrates that a love of labor is "one of the few recipes for happiness that can be

relied upon" (Ewing xviii). In the story, fairy godmothers experiment with various gifts for their respective godchildren to discover how mortals can be made content. Beauty, wealth, power, all fail. Instead, the godchild who is happy whatever happens has been blessed with the "Fairy Gift" known as the "Love of Employment" (Fairy 60). Reflecting the Victorian "gospel of work," Gatty sees being industrious as the key to defining and building character and to fostering well-being and a sense of fulfillment.

Just as with her seaweed avocation, Gatty's writing vocation began in her middle-age,[5] but this first publishing success did not contribute income to her growing family nor did it even involve natural history. Knowing as a new author that she would receive minimal payment for the stories, Gatty negotiated an unusual compensation for her work; for the first edition, she asked her publisher for a copy of Dr. George Johnston's book A History of British Zoophytes (1838) and for the second edition, a copy of his History of British Sponges and Lithophytes (1842).[6] A clergyman's salary for a family with ten children had not allowed Gatty the means to purchase books needed for her new pastime. Now with her acquiring these leading books on sea-life, her serious study of the marine world had begun.

Gatty's interest in seaweed illustrates the need many nineteenth-century women had for intellectual and personal fulfillment beyond their traditional societal roles. Natural history offered a creative and intellectually-stimulating outlet for many Victorian women. Women were often encouraged to partake in the study of nature "within the confines of a 'feminine' science which extended women's role as caretaker and moral and religious guide in the home" (Sheffield, Revealing 44). Natural history, particularly that associated with botany, was thought to be an excellent way to shape women "for their lives as wives and mothers" (Shteir 35). Botanical pursuits were relatively inexpensive, ideal for middle- and upper-class women who might have a great deal of leisure time to devote to collecting, identifying, and classifying specimens. At the same time, however, the assumption was that women would not actively contribute to scientific knowledge. Typical of many of the attitudes of the time is the admonition from geologist Hugh Miller (1802-1856) in a letter to his fiancée. "O my own Lydia," Miller writes, "be careful of yourself. Take little thought and much exercise. Read for amusement only. Set yourself to make a collection of shells, or butterflies, or plants. Do anything that will have interest enough to amuse you without requiring so much

attention as to fatigue" (qtd. in Barber 134). Miller's view of women's capabilities was unfortunately characteristic among many.

Though largely excluded from the institutional study of science, women still made up a large part of the culture of natural history. Even if not accepted as professionals or as intellectual equals,[7] many Victorian women found several ways to access the scientific community far more than would have been deemed possible by general societal standards. For example, some women excelled at creating accounts of scientific discoveries and concepts for the layperson, particularly women and children. Unable to easily follow Humphrey Davy's public lectures at the Royal Institution, for example, Jane Marcet wrote Conversations on Chemistry, Intended More Especially for the Female Sex (1805) in the form of a dialogue between a teacher and her pupils, intending to explain complex scientific concepts in a simple, straightforward manner. Other women were able to satisfy their scientific interests by collecting and cataloguing the natural world. In 1812 Mary Anning (1799-1847) of Lyme Regis found the first British ichthyosaur, and continued to discover additional fossils, even taking ten years to dig out a plesiosaur. Uneducated, Anning did not publish her findings or give public lectures; her

activities were for her own interest, and to provide an income for her family with the sale of the fossils to leading geologists. Other women found an avenue to science through illustration. Though only "partially revealed as the illustrator," Elizabeth Gould (1804-1841) illustrated her husband's seven-volume Birds of Australia (Gates, Kindred 74). These women and many others like them were able to "negotiate a place for themselves within the scientific community" by helping to popularize science (Sheffield, Revealing 3).

Gatty found her own niche in the scientific world with her study of seaweeds. The interest in seaweeds was one of many Victorian crazes in natural history, particularly during the mid-nineteenth century with the improved access to seaside resorts following the expansion of the railway network. Two types of seaweed enthusiasts existed in the field[8] -- the collector, who was content to examine the shore at low tide for stranded specimens, and the discoverer, who was willing to wade bravely into rock pools searching for rare finds (Allen, "Tastes and Crazes" 398). Typically, many women seaweed enthusiasts fell into the former group, content to gather specimens they accidentally came upon and then drying and mounting their finds into books. Indeed, David Allen notes that the lifestyle of

middle and upper-class women lent itself naturally to seaweed gathering since many of these women "were condemned to lives of boring uneventfulness in small, relatively isolated seaside towns, in which a regular walk along the beach was one of the few kinds of outdoor recreation permissible" (400). These women patrolled the beaches for the occasional rarity, "periodically packing off by post consignments of their gleanings" (400) to male scientists who could then classify and study the seaweed. Some women particularly enamored with marine botany produced natural history books for the lay reader, most notably The Marine Botanist (1848) by Isabella Gifford, Chapters on the Common Things of the Sea-Side (1850) by Anne Pratt, and The Common Seaweeds of the British Coast and Channel Islands (1865) by Louisa Lane Clarke. These popular works include "emotional and aesthetic responses to the natural world" (Hunt 7), distinguishing themselves from more purely scientific texts. Pratt, for example, reveals her passion for nature and the outdoors in her book's opening sentence: "It is delightful on some fine summer's morning to wake up to the loud continuous sounds of the waves, and to stray along the shore, with eye and heart alive to the natural beauty of this world" (qtd. in Shteir 206). In addition to providing culinary uses of plants, Pratt also occasionally includes

short poems about plants to convey her love for botanical study.

Gatty belonged to the second category of seaweed enthusiast and was more active in her pursuit, first wanting to learn all she could about seaweeds from books and from experts in the field, and then venturing forth on her own. As she delved into her study, she was also certain not to forget the practical duties of her daily life. She began to create "presentation copies of books filled with mounted specimens of seaweeds which she then sold and used the proceeds to buy blankets" for the poor (Hunt 17).

In subsequent years as Gatty became more confident in her study and educated herself further in the pursuit of algology, she became frustrated by the lack of suitable books introducing seaweeds to beginners. Deciding to write a textbook herself, she confesses in a letter to Harvey in 1857,

> I have long contemplated making an attempt at a Horn Book of Algology. I do not see that Dr. Landsborough's Popular History has in reality simplified the study; and people who possess both the Phycologia and it, have for years written to me for explanations. (qtd. in Maxwell 94)

Her motive was not to discover new specimens or to compile new information but to make current material more accessible to the ever-widening audience of amateur natural historians.

In 1863, Gatty published The History of British Seaweeds, a guide for the serious amateur to the discovery and identification of seaweed specimens: "I worked for about 8 months at the Seaweed book Bell employed me upon & it is now completed at Price 3 Guineas Fearful [underlined three times]—but the no. of plates drove him upon it" (qtd. in Sheffield, Revealing 25). The book -- the achievement of 14 years experience with seaweeds -- was illustrated with 80 colored plates, containing 384 figures reduced from those in the Phycologia Britannica. Beneath the title, the description "Drawn from Professor Harvey's 'Phycologia Britannica'" identifies Gatty's source, but the book itself is a respectable and accurate popularization of the more technical-oriented scientific studies and "was still being consulted as a standard text of classification in the twentieth century" (Hunt 13). Gatty comments on almost two hundred species of seaweeds in a simple yet serious and thorough manner. She extols the virtues of scientific knowledge and "recommends algology as an appropriate pastime for both men and women who were interested in learning" about the goodness of God (Ewing xxi). In keeping with her self-acknowledged role as a popularizer, she also cautions that "[s]hould any one, from looking at these descriptions, desire to rise out of amateurship into

science, he will seek and find his proper food elsewhere" (In Nature's Name 555). Gatty recognized her limits as an amateur naturalist and the audience most likely to benefit from her work.

In the introduction to the volume, Gatty reiterates the moral from her first book, The Fairy Godmothers, and advises that "whoever would find the world interesting must work out an interest in it for himself," and that "nothing answers so effectually as a healthy, earnest employment" (Ewing vii). Gatty's theme reflects the growing obsession that many middle class Victorians had in the first half of the nineteenth century with rational amusement, that careful balance between amusement and instruction. Amusement by itself was "vulgar and left to the lowest classes" (Barber 123); an element of usefulness and/or moral uplift needed to be present to make a pursuit worthwhile. Aside from the preface, she does not make much reference to natural theology, for she realizes readers have come to the text for facts not sermons. Still, she does underscore that God has bestowed upon man the wonders of nature "not merely as a picture-book to be stared at, but as written pages to be read and studied" (viii).

In addition to emphasizing nature's beauty and complexity, Gatty also provides practical advice for her

readers as they explore the seashore. For women seaweed collectors and the frequent difficulties they have in this pursuit, Gatty recommends laying "aside, for a time, all thought of conventional appearances" and removing clumsy cloaks or shawls, finding a sturdy pair of gloves, and donning a hat instead of a bonnet. As for one's petticoats, "if anything could excuse a woman for imitating the costume of a man, it would be what she suffers as a seaweed collector from these necessary draperies!" (qtd. in Maxwell 96). Choosing woolen material and never letting the petticoats come below the ankle, the woman naturalist then gathers her necessary tools: "a basket, a bottle, a stick, a strong pair of boots, and, let us add to crown the comfort, a strong, friendly, and willing, if not learned companion" (qtd. in Maxwell 96). The unladylike activities of scrambling over rocks, wading into tide pools, and keeping a watchful eye on the ebbing and flowing of tides gave Gatty such a sense of euphoria

> that to walk where you are walking, makes you feel free, bold, joyous, monarch of all you survey, untrammeled at ease, at home! At home, though among all manner of strange, unknown creatures, flung at your feet every minute by the quick succeeding waves. (Preface to Seaweeds xi)

The freedom and novelty of pursuing natural history provided Gatty with a much needed release from her domestic duties as wife and mother. After being away a month

collecting seaweeds in 1865, for instance, Gatty writes in a letter to her sister, “It was a great mental rest to do nothing but Seaweeds” (qtd. in Sheffield, Revealing 33).

Both Johnston and Harvey became friends and colleagues to Gatty over the years, and a regular correspondence with her continued until the deaths of Johnston in 1855 and of Harvey in 1866. She often wrote to both for help and advice regarding her new avocation. Gatty also assisted Harvey in finding and identifying specimens and in handling some of his correspondence (Sheffield, Revealing 31). Her intellect and passion for seaweeds so impressed the two men that they even helped name two marine species after her -- Gattya pinella, an Australian algae discovered by Harvey and Lep. Gattiana discovered by Gatty herself. After corresponding with Gatty for ten years before they met in person, Harvey describes his first impression of her upon meeting: “She is slight, tallish, and intellectual looking and withal quiet; at least as yet nothing very mercurial has broken out. But there is evidently the mercury below the surface, and I can quite fancy her blazing up. . . when strongly excited” (qtd. in Maxwell 125). Harvey glimpsed the private Gatty, the passionate one revealed by her letters when she is most anxious about the new directions materialistic science seems to be driving her world.

Despite her religious conservatism, Gatty was often very open to new ideas that did not directly conflict with her faith. Once, at a dinner at a friend's home, she insisted on eating the local fungi that she had gathered. Commenting to a friend, Gatty boasted,

> You should have seen us at dinner with the dish. Neither Mary nor Jane would touch them, only Undine and I. So we shook hands with them and took leave before we began!!. . .both Undine and I are crazy on the subject, and wherever you go and are, you must look out for funguses for us!! (qtd. in Maxwell 102)

Similarly, Gatty was receptive to new medical advances such as the use of chloroform to alleviate pain. In fact, she became an enthusiastic disciple, even converting her local physician: "Do I know chloroform? Twice it has seemed to me what you say 'Angels' food'. . . .I stare at people who call it nasty and detest the smell, assured they never have known the ecstasy of relief it brings and which endears one to it as a matter of course" (qtd. in Maxwell 101). According to Juliana, her mother was "equally impatient with the prejudices of scientific people in their slowness to welcome new discoveries to help the suffering, and with those of the unscientific people who regarded such help as an interference with the regular ways of Providence" (Ewing xviii). Gatty's odd mixture of progressiveness and

conservatism lies at the heart of her work as a writer and naturalist.

During the fourteen years she meticulously prepared her text on seaweeds, however, Gatty did not neglect her popular writing, which became more profitable as her reputation grew. The Literary Churchmen praised her books as being among "the highest class of juvenile fiction" (qtd. in Sheffield, "Introduction" viii). After The Fairy Godmothers, Gatty produced a variety of works: Parables from Nature (five series published between 1855 and 1871); collections of moral tales such as Proverbs Illustrated (1857), Legendary Tales (1858), and The Human Face Divine and Other Tales (1860); a collaboration on the autobiography of Joseph Wolff, Travels and Adventures of the Rev. Joseph Wolff (1860), and the domestic story collections Aunt Judy's Tales (1859) and Aunt Judy's Letters (1862). The title character and narrator of the latter two collections was modeled on Gatty's daughter, Juliana, who was nicknamed "Aunt Judy" by her siblings. Juliana's storytelling within the family helped manage the younger children while also serving as Juliana's own creative outlet as she refined her own literary skills. The final work Gatty saw into print before her death was A Book of Emblems (1872). With such a variety of works in only

twenty years, Gatty's popularity grew as both a writer and an editor. At her death, the London Illustrated News described Gatty as "one of the best authors of wholesome and pleasant reading for young people" (qtd. in Sheffield, "Introduction" viii).

Although a highly regarded writer for children by her contemporaries, Gatty would be subsequently overshadowed by a more prominent writer, her own daughter, Juliana Horatia Ewing. In 1861, three of Juliana's stories were published in Charlotte Yonge's The Monthly Packet. Gatty began to realize that her time for writing children's books was largely over. Speaking of Juliana in a letter to a friend that same year, Gatty recognizes her daughter's talent, saying she "will go far beyond me in pathos and power, there is no doubt" (qtd. in Maxwell 117). Gatty was also beginning to experience health problems, causing her to feel increasingly tired and overworked. In the same letter, she confesses her need for a change:

> Thankful indeed I shall be when the end comes and Aunt Judyism is over! It is impossible to continue it now that the real Aunt Judy [Juliana] has wings, and has soared so far above the imaginary one. However, I am in the last letter, and when I lay down my pen, it will be something like lying down to rest altogether, so burdensome has the effort become. (qtd. in Maxwell 117)

As dedicated and industrious as Gatty had been, she now was looking for a new literary venture, one that not only paid well but also might be less demanding of her time.

In 1866, George Bell asked Gatty to edit a new magazine for children, Aunt Judy's Magazine[9] (1866-1885). While this magazine during its nineteen-year run rarely made a profit, it did find a select audience with its moralistic fiction and its eclectic selection of articles in science, history, and philosophy. During her tenure as editor, Gatty published stories by Hans Christian Anderson and Lewis Carroll, in addition to her own tales and those of her daughter, Juliana. In a foreword to the first number that appeared in May 1866, Gatty reassures parents who "need not fear an overflowing of mere amusement. They will find in another place our 'Memoranda' or things to be remembered in each month—and these will comprise facts and anecdotes, historical, biographical, or otherwise, deserving a niche in the brain-temple of the young" (qtd. in Maxwell 148). As editor, Gatty also included an emblem in each number of the children's periodical, defining emblems for her readers as "allegorical pictures, typifying some moral truth" ("Introduction" 2). As I discuss later in the chapter, whether Gatty was writing fairy tales, emblems, or parables, moral allegory was basic to her

imagination and indicative of the didactic literary tradition to which she belonged.

Gatty's literary and scientific accomplishments are remarkable for having been achieved despite family and parochial responsibilities, and her increasing ill health. She was afflicted with an undiagnosed and painfully disabling form of paralysis for the last ten years of her life. As early as 1860, Gatty had begun to exhibit neurological problems, such as tremors in her hands and semi-paralysis in her right arm, and was occasionally forced to remain in bed for days due to severe attacks. Various physicians initially diagnosed Gatty's condition as rheumatism, neuralgia, and writer's cramp. In one of her letters, Gatty relates her physician's diagnosis: "'He calls it 'atrophic degeneration of the muscular fibers from overuse,' so my troubles have at any rate got a fine name!" (qtd. in Murray 54). Her fourth volume of Parables was written entirely with her left hand. When her left hand began to display similar symptoms, she assumed it was a result of the overuse of her weaker arm, and she began writing by dictation. A tic began in her face (most likely trigeminal neuralgia), and her doctor prescribed rest by wintering at the Bath mineral waters in southwestern England. Finally, Gatty was unable to write with either

hand and had difficulty walking due to weakness and curling of the foot muscles in her right leg. While doctors still assured her recovery was likely, her condition deteriorated with her speech becoming affected and the paralysis moving to her legs. In 1870, she wrote to a friend, “You must prepare to see me unable to hold up my head -- I tie it up sometimes’” and “I am a complete cripple & feel very weak, but not in bad spirits” (qtd. in Murray 56-57).

The woman memorialized by a stained glass window in the parish church at Ecclesfield died in 1873 after a respiratory infection at the age of 64. Her faith in God, her passion for seaweed, and her love for children had sustained her as a wife, mother, naturalist, writer, and editor. The moral and intellectual rewards of her science popularization in particular were illustrative of the message of her first literary work The Fairy Godmothers. She had found a love of employment at the seaside, one which she spent the remainder of her life fostering in others as a way to see the book of nature as the book of God:

> They saved her life and dragged her home.
> She vowed in time to come.
> So far she would not roam;
> But vainly promised she.
> For still at night the Gattys call their mother home,
> And save her from the sea. (qtd. in Shteir 185)

Parables from Nature: Gatty's Lessons of Faith

Gatty's most enduring work was her Parables from Nature. As Alan Rauch indicates, we must distinguish between contributions to science, as in her British Seaweeds, and contributions to the culture of science, as in her Parables ("Parables and Parodies" 139). The former work was a scientific text designed to aid the classification of seaweeds by both amateurs and professionals. The latter book, however, is a remarkable mixture of moralizing and natural history meant to inspire readers to learn about nature and science in their understanding of God. Parables reveals the natural world as a place where moral dramas are enacted and from which moral lessons can be learned. Gatty's purpose in many of these parables was to use natural theology as the impetus for studying natural history and use natural history to further reinforce the arguments of natural theology. For Gatty, a conflict did not exist between religion and science; the conflict was between religious science and irreligious science (Cosslett, Science and Religion 2).

Like many in her generation, Gatty was well-versed in the natural theology argued earlier in the century by William Paley (1743-1805) in his work Natural Theology; or, Evidences of the Existence and Attributes of the Deity,

Collected from the Appearances of Nature (1802). Although largely a summary of the work of seventeenth- and eighteenth-century predecessors such as John Ray's The Wisdom of God Manifested in the Works of Creation (1691), Paley's popular Natural Theology focuses on the argument from design, introduced in the analogy of the watch on the heath in its well-known opening pages. Just as the intricate structure of a watch implies a watchmaker, so the incredible complexity of living things proclaims the power of their Designer. For Paley and his followers, each detail, each discovery within nature, reasserts the power, wisdom, and existence of an intelligent creator with a rational purpose. Paley's arguments were not new but they did emphasize the utilitarian aspect of the argument from design, arguing that every part of an organism is useful to it in its mode of life and "this universal adaptation of structure to function illustrates the wisdom and benevolence of a God who cares for His Creatures" (Bowler and Morus 34).

Natural theology gave a purpose and context to a long tradition of popularizing natural history, one that had begun as early as 1730 with the publication of Thomas Boreman's A Description of Three Hundred Animals. Popularizers who followed natural theology would invariably

focus on features of the natural world that inspired admiration and argued how these features, once properly interpreted, demonstrated the wisdom and power of God. Vast numbers of plant and animal species offered an endless source of examples to illustrate the complexity of the material universe and the care with which its component parts had been designed by God, and in turn, encouraged the belief that the system of Nature was static and stable. For the first half of the nineteenth century, Paley's text was the foundation for the argument from design, though his arguments sustained continual assaults from the growing skepticism of science. What seemed to be unanswerable questions about the origin of the universe and man's place in it had been described as mysteries of God beyond man's understanding. Little time, however, was spent on speculating about and theorizing the unknown, other than simply accepting it as part of God's plan. For the devout natural history writer, "[p]iety was, after all, far more important than accuracy, religion more important than sciences" (Barber 82). Revealing the wonders of nature to illustrate the power and wisdom of God was often sufficient for these writers.

Gatty differs from many of her predecessors in science popularization in her attention to scientific accuracy and

detail. Striking a balance, she uses her writing both to instruct child readers about the natural world and to "demonstrate Christian truth" (Avery 72). Secular works might suffice for adult readers, as in British Seaweeds, but for children and those adults in need of clarity and reassurance, popularization of science needed a spiritual element. By the 1850s, natural theology had lost much of its hold on the popular view of the world and of man's place in it. As useful as natural history had traditionally been in providing "rational amusement," Gatty felt something was missing. With numerous popular works covering such topics as mechanics, astronomy, optics, and magnetism, useful and factual information began taking the dominant place that moral education had formerly occupied, thus emphasizing the extreme utilitarianism that Dickens had warned of in "Frauds on the Fairies" in 1851. Morality and religion, of course, were not banished from children's literature; instead, by mid-century, children were finally considered as an independent audience, one that could interpret matters for themselves.

Some writers such as Gatty, however, perceived a danger in this independence, believing "works of science for children were apparently turning young minds toward a contemplation and acceptance of material reality and away

from the more abstract realm of theology" (Rauch, "A World of Faith" 16). Gatty's writing, however, was still greatly "shaped by the allegorical didacticism of a former time and had more in common with the concerns of Bunyan's Christian than with those of Carroll's Alice" (5). Whereas previous natural theology writers describe Nature's workings in order to show that they must have been made by an intelligent designer, and use evidence from Nature to demonstrate God's benevolence, Gatty draws from several overlapping traditions -- parable, allegory, and emblem -- in which nature "functions as a metaphor for hidden spiritual and/or moral meanings" (Cosslett, "Talking Animals" 101).

In 1855, desiring to teach children from a natural theology perspective, Gatty approached George Bell, the publisher of her British Seaweeds, with her collection Parables from Nature. Unfortunately, Bell refused to publish Gatty's stories, so she ran the financial risk of the first edition and gained her first insight into the world of editors and publishers: "He [Bell] wanted me to turn the "Lesson of Faith" into a story and put it in a magazine!. . . .It is a curious comment on booksellers' judgments as you know. He said the size alone would prevent its selling" (qtd. in Maxwell 108-09). The first

series of Parables appeared in 1855, appropriately dedicated to her mentor Dr. Johnston, and the second in 1857, both including illustrations by Gatty herself. In 1861, Gatty's two eldest daughters, Juliana and Margaret, contributed designs to the third series. The fourth and fifth series appeared in 1864 and 1871, respectively. In 1880, a posthumous edition was published, containing all of the parables appearing in the original series in one volume, along with natural history notes written by Gatty herself for the first four series of stories and by her son Stephen Herbert Gatty for the fifth series. The notes were directed toward older children and for adult readers who wished to know more scientific details about the plants and animals mentioned in the parables.

For Gatty, natural theology, simply defined, was a way of understanding God by studying His creation. From this perspective, Gatty approached the natural world with rational observation, exploring scientific ideas within the bounds of Christianity and thus creating a scientific theology. Although all five series of the Parables are firmly rooted in scientific information, one of Gatty's central themes is that scientific knowledge alone is insufficient to inform us of God's plan. At the same time, however, her parables exhibit a tension between the

importance of scientific research and the impertinence of theoretical speculation. By the time of her writing Parables, Gatty was resisting the growing shift from religious to secular ways of seeing the natural world. Her choice to write children's literature was her attempt to inculcate a resistance to materialist explanations for nature and illustrate that "God and nature could never be treated separately" (Rauch, "Parables and Parodies").

Gatty's initial inspiration for Parables had come from the fairy tales of Hans Christian Andersen (1805-1875), first published in English in 1846, but she disliked the absence of any moral in his work; his stories were "only quaint and taught nothing: imperfect 'devices' -- the body without the soul!" (qtd. in Katz 46). Gatty's choice of the parable as her narrative form was appropriate since her intent was to translate complex spiritual concepts into simple and concrete lessons.[10] From Greek, meaning "placing along side of" for the purposes of comparison, a parable is a short story designed to reveal allegorically some religious, moral, or philosophical meaning. Probably the best known parables are those from the Gospels, such as "The Prodigal Son" and "The Good Samaritan." Biblical writers often used parables to convey enigmatic truths in an easily understandable way, taking the familiar and

applying it to the unfamiliar; for example, a farmer sowing seed is analogous to Christ preaching the Word of God. Parables combined Gatty's love of science and nature and her desire to impart knowledge to children (and her faith in God as creator). Her parables interpret the moral truths of life in simple fashion, but the descriptions of plants and animals are based on the writer's accurate knowledge of the minutiae of nature.

Although Gatty's parables are often collectively labeled as stories about natural history, considerable variation exists among the parables throughout the five series; they take the form of fables, vignettes, allegories, even cosmological myths. The type that I am concerned with here are those that explicitly use natural history to comment on philosophical or religious ideas. Like the emblems in Aunt Judy's Magazine, the illustrative property of the parable appeals both to the understanding and to the imagination of readers. As an anonymous reviewer in 1864 notes, "Certainly in her department she walks alone. . . .Mrs. Alfred Gatty so pleasantly finds, in a world of images, very frequently the real meaning of things. For our parts, we have a great reverence for the parable-uttering art. It has often been used as the inlet to all knowledge" ("Mrs. Gatty's Parables" 222).

Similar to the conversation format of natural history works from the 1820s and 1830s, these parables follow an instructive storyline, involving characters whose varying levels of knowledge allow for a question-answer exchange. Much of Gatty's writing for children exhibits what Wendy Katz terms the "Auntly Voice," a friendly but authoritative narrator who respects the contemporary child reader and makes "modest -- if only occasional -- attempts at humor," while encouraging interpretive reading (5). The major difference, though, between Katz's scenario and the situation in Gatty's stories is that the knowledge authorities and their students in the parables are usually not human but are creatures of the natural world -- caterpillars, flowers, seaweed, and starfish. Gatty uses these creatures to present human debates on man's place in the world and his relationship with his Creator.

In her parables Gatty has added fantastic elements such as talking animals and plants to help create a sustained sense of wonder, but realistic detail is also used to insure scientific accuracy behind those fantastical elements. Since her immediate audience is children, using anthropomorphized characters gives the parables a fable-like feel. In fact, the strict literary definition of parable excludes animal characters, thus technically

classifying Gatty's stories as fables instead of parables. Gatty likely labeled her tales parables because of their allegorical approach to complex moral and philosophical ideas.

Providing this narrative strategy of using an animal or plant point of view is a common defamiliarizing technique in children's literature, in which objects we recognize are described from the unfamiliar perspective and a scale of non-human protagonist (Cosslett, "Talking Animals" 32). Caterpillars, starfish, and seaweed may interpret their duties and meanings in human fashion, but their stories also reveal our fascination with the life of the natural world. The fantastic elements also assist the parables in conveying a message in a less offensive or more subtle form than that of direct assertion. Gatty uses the parable form, rich in metaphoric possibilities, as her literary assault against religious doubt without alienating any of her potential readers. Couched in the guise of beast fables and parables, Gatty's conservative natural theology tradition appears innocuous yet can subtly shape young readers' minds about God's creation.

While the various parables from the five series focus on different moral and theological issues, one theme common to a number of parables is that of transformation. For

example, “A Lesson of Faith” from the First Series[11] uses an iconic image of transformation in natural history -- the caterpillar changing into a butterfly. The parable relates the simple story of a caterpillar entrusted with looking after a dying butterfly’s eggs. Informed by a Lark that the eggs contain more caterpillars and that she herself will one day also transform into a butterfly, the caterpillar refuses to believe such a farfetched story, exclaiming "I know what's possible, and what's not possible, according to my experience and capacity, as well as you do” (11). Then she realizes the Lark had spoken the truth when she sees for herself the new caterpillars coming forth from the eggs. When she prepares to enter her own chrysalis, the caterpillar declares, “I shall be a Butterfly some day!” (12). And later in her life when she is indeed a Butterfly and about to die, she says,"I have known many wonders -- I have faith -- I can trust even now for what shall come next!" (12). Beyond the literal storyline is the moral message that the reader should have faith in a future resurrection. In fact, the illustrator of the story, Philip Calderon (1833-1898), created an accompanying illustration for the tale that depicts a young woman on her deathbed with the human soul leaving its earthly shell. Thus, the

theme of transformation follows both a physical and a spiritual path.

Not all Gatty's parables are as simple in theme or in narration. In a parable from the First Series, "Knowledge Not the Limit of Belief," for instance, Gatty uses errors in scientific classification to argue that "observation and revelation are the sole means of acquiring knowledge" (21). In this parable, a zoophyte, a seaweed, and a bookworm in a naturalist's study engage in a philosophical discussion regarding epistemology, particularly the knowledge of man, as exhibited by the naturalist whose study they are now in. The constantly changing state of knowledge is first presented by the Seaweed, who explains that he and the bookworm had quarreled half the morning over whether or not "I am an animal or a vegetable" (19). Furthermore, the Zoophyte, as the Seaweed notes, was once considered to be a vegetable and only recently had been reclassified by naturalists as an animal. This error, though now corrected, implies to the Zoophyte that man is not "wonderfully wise" but rather "wonderfully stupid." The Bookworm chastizes the zoophyte by saying, "You are quite within the grasp of his [man's] powers but he is quite beyond the reach of yours" [emphasis Gatty's] (20). Because neither the Zoophyte nor the Seaweed possesses the sense of sight, they are

restricted to a very narrow range of understanding the world. Sight cannot be truly explained to those to whom God has not given that particular sense, but "even where you cannot understand the wonderful powers themselves, you may have the grace to believe in their existence, from their wonderful results" (21). As Gatty illustrates, any controversy between science and religion is actually a controversy over the nature and limits of knowledge (Uffelman 69).

Surprisingly, though a completely fantastical creature, the Bookworm is Gatty's mouthpiece, for his point is the same as that evidenced throughout Gatty's parables: "to limit one's belief to the bounds of one's own small powers, would be to tie oneself down to the foot of a tree, and deny the existence of its upper branches" (22). The analogy, as Rauch succinctly states, is that "we are to God as the Zoophyte is to the naturalist" ("Parables and Parodies" 143).

In the endnotes for "Knowledge," Gatty first provides factual information, defining the characteristics of a zoophyte that may be useful to an understanding of the story's content:

> It is very difficult to describe what a Zoophyte is, to a person who has not seen one; but a general notion may be given, by saying that these formations, whether flat, and spreading, or

> branching like trees, are covered with minute open cells, in each of which resides a tiny creature called a Polype, which has its own separate existence in one way, although dependent on the life of the whole formation (called Polypidom) in another. . . . A Zoophyte may therefore be considered a compound animal; or perhaps it may be likened to an animated tree. . . . (437)

From these objective descriptive details, Gatty then moves to a commentary on the moral lesson of her parable. She calls upon

> those who think that everything is open to the investigations of man, [to] try to excogitate a new sense; the total impossibility of doing which, is scarcely sufficiently thought of. Yet who shall be so bold as to assert positively that our five senses are all that can be possessed by a creature endowed with life? (437)

Gatty's cautionary moral here is directed as much to adult readers as to children.

Gatty would certainly have agreed her primary audience consisted of children to whom she wanted to show science and nature in moral terms. Still, she found ways in her parables to counter subtly the leading philosophical or scientific theories of the day, particularly those of Alfred Tennyson (1809-1892) and Charles Darwin (1809-1882). Interestingly enough, Gatty, Tennyson, and Darwin were all born in 1809, and over the next half-century witnessed some of the most fundamental transformations of beliefs about nature and the place of humans in the universe. For

centuries, Christians had believed in a literal Genesis with a six-day Creation. In this account, species had been created separately and organized into an unchanging hierarchy, with humans positioned just below the angels. Yet beginning in the eighteenth century and continuing into the nineteenth, geologists had demonstrated not only the vast amount of time required for the formation of the Earth's surface, but also the importance of slow evolutionary change, rather than rapid catastrophic change. More serious problems would arise when the concept of development was extended from geology to biology. The scientific picture of an impersonal nature functioning without direct divine intervention unsettled many people. Such a picture was difficult to accept yet increasingly difficult to resist.

Gatty's scientific sensibility, on the other hand, was tempered with her strong faith in God. Her exact beliefs about the age of the earth are not known, but in her letters and her parables she often cautions readers not to make definitive claims beyond what is immediately observable:

> But is it not strange there is so little intelligence to be obtained about people and things only a few hundred years old, while geologists and philosophers are settling how the world was created billions of aeons ago, as coolly as if they were omniscient?

> Certainly. . .geologists get hold of a great many facts all over the world; but then, as I argued, that does not prove that they are capable of coming to right conclusions about them. (qtd. in Sheffield 49)

Gatty believes in empirical data that can be gathered about the natural world; however, she is reluctant to speculate and theorize about such information. This tension between "the importance of scientific research and the impertinence of theoretical speculation is central to any reading of Gatty" (Rauch, "Parables," 142). For Gatty, classifying and describing are suitable scientific tasks, but interpretation beyond the observable is tantamount to pretending to understand the mind of God, an irreverent and fruitless pursuit.

Gatty's faith in God also supported her in countering the religious doubt that she saw in Tennyson's poetry. Several of Gatty's parables, for example, even open with epigraphs from Tennyson's poetry, particularly from In Memoriam (1849). Gatty accidentally met Tennyson in 1858 while traveling to Brighton. While the exact details of their first meeting are unknown, in a letter to Harvey in 1859, Gatty acknowledges that "I dare do anything after daring to introduce myself to the Laureate" (qtd. in Maxwell 127). Even the imposing Tennyson could not easily intimidate the same woman in whom Harvey had suspected

mercury lay just below the surface. From that meeting, a close friendship developed, with the Gattys staying with the Tennysons at Farringford several times during subsequent years. Despite her immense respect for Tennyson's poetry, Gatty felt no qualms about arguing with the poet regarding his definition of the man of science -- "an eye well practised in nature, a spirit bounded and poor." For Gatty, study of natural history "meant an enlarging of the soul" (Maxwell 128), making the student feel more connected with God's creation.

Gatty did not struggle with the same doubts that Tennyson does in his elegy In Memoriam, written between 1833 and 1850. In this poem, the poet's lack of faith initially seems to be the result of the death of his close friend, Arthur Henry Hallam. But the growing doubt is also symptomatic of the times, evidence of an increasingly skeptical Victorian society. Indeed, the poem contains Tennyson's most important confrontations with contemporary science, particularly with geology and biology, and the resulting effects on the human psyche. Drawing upon two works in particular, Charles Lyell's Principles of Geology (1830-33) and the anonymously published Vestiges of the Natural History of Creation[12] (1844), Tennyson illustrates the Victorians' growing awareness of another sort of past

beyond recorded history: the vast expanse of geological time and evolutionary history. The new discoveries in biology, astronomy, and geology implied a view of humanity that distressed many Victorians, anticipating Darwinian conceptions of evolution and their implications, such as the extinction of the entire species, including man. Vestiges, one of several forerunners to Darwin, combined various speculative theories of cosmic and biological evolution to propose a composite theory of transmutation. According to Vestiges, everything currently in existence has developed from earlier forms (the solar system, Earth, rocks, plants, animals) engineered through laws built into nature by its Creator and not through a succession of miracles.[13]

Tennyson possessed a painful awareness of the brutality and indifference of "Nature, red in tooth and claw" (56.15). Although Tennyson associated evolution with progress, he also worried that the notion seemed to contradict the Biblical story of creation and long-held assumptions about man's place in the world. Nonetheless, in In Memoriam, he insists that we must keep our faith despite the latest discoveries of science; he writes in the prologue, "Strong Son of God, immortal Love / Whom we, that have not seen thy face, / By faith, and faith alone,

embrace / Believing where we cannot prove" (1-4). At the end of the poem, he concludes that God's eternal plan includes purposive biological development; thus he reassures his Victorian readers that the new science does not mean the end of the old faith. In Memoriam has taken the reader from despair to doubt and then to hope before arriving at faith.

One key difference between Tennyson and Gatty is that the poet emphasizes the necessity of maintaining doubt, for doubts strengthen individuals by forcing them to reason and fight against their uncertainties: “There lives more faith in honest doubt, / Believe me, than in half the creeds” (96.11-12). Gatty, on the other hand, uses the form of the moral tale in her Parables to conduct “a polemic against scientific naturalism and attendant doubt” (Cosslett, “Animals under Man” 137). In “Whereunto,” from the Third Series (1861), Gatty illustrates her faith in everything in creation having its own designed purpose. She takes as her epigram for the story a line from Tennyson’s In Memoriam, section 128: “I see in part/That all, as in some piece of art, /Is toil cooperant to an end” (22-24). The parable opens with a conversation on a beach at low tide between a crab and a stranded starfish. Two men approach, one

complaining loudly how he can see no purpose in life and pointing to the dying starfish as an example:

> Wasted life and wasted death, and all within a few inches of each other! Useless, lumbering plants, not seen half-a-dozen times in the year; and helpless, miserable sea-creatures dying in health and strength, one doesn't know why. . . . Purposeless life and purposeless death. (227)

This speech echoes one of Tennyson's questions from section 55 of In Memoriam:

> Are God and Nature then at strife,
> That Nature lends such evil dreams?
> So careful of the type she seems,
> So careless of the single life;
>
> That I, considering everywhere
> Her secret meaning in her deeds,
> And finding that of fifty seeds
> She often brings but one to bear (5-12)

While Gatty's character reiterates nature's wastefulness and inefficiency, the difference is that the doubter tosses a stranded starfish into the air with his stick and it safely falls into the shelter of some seaweed growing beneath a rock. After the men move on, the starfish exclaims that the men do have a purpose as one had saved her life, and at this point all kinds of creatures and vegetation chime in, to say how they too have a purpose in life. Human egotism is now satirized with the blue-eyed limpet, the Patella pellucida, who argues that the plants are his natural home and his "turquoise-gemmed back" adorns the plants in return, remarking that "the whole thing is

perfect and complete" (232). Then microscopic animals living on the tangles chime in that the tangle plants exist as foundations for their entire colonies. A shellfish and then a coralline each add their perspectives, likewise assuming the natural environment is centered on them.

The two humans retrace their steps and jump upon a ledge of rock to watch the tide begin to return. As they do so, they watch the tangle plants and see

> how the huge fronds surged up like struggling giants, as the waves rushed in below; and how by degrees, as the tide rose higher and higher, their curved stems unbent, so that they resumed their natural position, till at last they were bending and bowing in graceful undulations to the swell of the water, as was their wont. (235-36)

These tangle plants with their myriad residents reveal the complex interdependence of the seashore ecosystem, very much prescient of Darwin's tangled bank in the conclusion of <u>On the Origin of Species</u>:

> It is interesting to contemplate a tangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent on each other in so complex a manner, have all been produced by laws acting around us. (397)

The major difference is that while Gatty sees a fixed, closed system of marine life operating according to divinely created laws, Darwin envisions that "from so

simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved" (398). These contrasting interpretations underscore the debate between natural theology and scientific naturalism that Gatty addresses in several of her parables.

The sea has something to say as well in this debate about purpose. Mocking the various creatures for their pretensions to knowing the purpose of the tangle plants, the sea explains that the plants exist for a much greater reason -- "to keep me, the great sea, pure, and sweet, and healthy! There now, that's the reply! They suck in my foul vapours as food, and give me back life-supporting vapours in return. Vile and useless! What fool has called anything so?" (237). Gatty's moral is that all but the human doubter speak of their place in creation; we must have faith not just in creation but in God's order and plan for all creation. Her debate with Tennysonian doubt "is informed by scientific understanding, and her attitude to the natural world is tough-minded and brisk" (Cosslett, "Animals Under Man?" 138). These lessons on the interdependence of sea life also emphasize the limitations of everyone's perspective when compared to the design of a higher being. Again, though this parable is designed to entertain the child reader with talking animals and plants, the moral is

not just aimed at children. The story is a "covert address to an adult doubter, hidden behind an overt address to children" (140). Such a dual address -- where the writer speaks alternatively to the children and to the adults who publish, purchase and perhaps read the book aloud -- is not unusual in Gatty's parables, which can sometimes result in mixed messages. Gatty advocates a particular interpretation of the natural world, one that not only instills respect for nature but also reinforces faith in God. The simple, illustrative properties of a parable convey this new lesson to children while gently reminding the adult readers of their faith.

Even though Gatty challenged what she believed to be weaknesses in Tennyson's outlook, she directly attacked the heresies she saw in Darwin's ideas. Although she read Darwin, she vehemently rejects his ideas, writing to George Bell, her publisher, "What do you hear of Darwin's Origin of Species? What a madness has seized on the Naturalist World!" (qtd. in Sheffield, Revealing 48). In a subsequent letter to Bell, Gatty warns that "Darwin's collection of facts and his candour and simplicity are all admirable. But I think his mind is in a wrong direction. He has endeavoured by 'searching to find out God' & the attempt apart from his fact learning is downright ridiculous" (qtd.

in Sheffield, Revealing 49). Gatty, in another letter to Harvey, continues to be "horrified at the idea of a scheme which involved destruction & death -- tooth & claw work -- chewing blood & flesh work -- ah bah! Bah! Bah! -- from the beginning. It makes the soul sick and the whole heart full of faintness. . . ." (qtd. in Sheffield, Revealing 49). With this stance, Gatty echoes an earlier generation of science popularizers who had viewed scientific inquiry as a virtue only to a point. Knowing the descriptive details of Nature enhances one's admiration of Creation. Investigating first causes, however, is unnecessary and perhaps even subversive to faith.

To express her concern about such subversiveness, Gatty directly satirizes Darwin's ideas in her most uncharacteristic parable, "Inferior Animals," also from the Third Series. Here, she addresses the issue of evolution in an effort to discredit it for both young and old readers. She prefaces the story with an epigram from Goethe: "How? When? And I whence? The gods give no reply. / Let so it is suffice, and cease to question why" (281). For Gatty, endless speculation beyond what is empirically knowable is pointless. Man should stop trying to interpret God's plan or asking why things are the way they are, just as the zoophyte and the seaweed of the earlier parable had to

accept their place in creation in relation to the naturalist.

"Inferior Animals" begins with a frame story in which the narrator describes the noisy cawing of rooks in the sky and in the trees. The narrator goes on to draw parallels with human speech, the rooks evidently understand one another even though to humans their speech is just noise. She emphasizes "the barriers which lie so mysteriously between us and the other creatures among whom we are born, and pass our short existence upon earth!" (282), and then proceeds to explain how natural it is "that the lower should not fully understand the higher" (284). A child, for instance, may instinctively desire to reach out and communicate with her pet, not realizing the gulf that lies between the animal and herself; the pet cannot know her intentions and may scratch the child or shy away in response.

Despite this reference to a child's innocent view of nature, Gatty's intention in the parable is satire, an ostensibly sophisticated literary form. To that end, Gatty quickly drops even the pretense of addressing children and directly calls out to adults:

> Reader, can you hear this and remain unmoved, or shall you and I become children in heart once more? Come! own with me how hateful were the lessons which undeceived us from our earlier

> instincts of faith and sweet companionship with all created things: and let us go forth together, and for awhile forget such teaching. Hand in hand, in the dear confiding way in which only children use, let us go forth into the fields, and read the hidden secrets of the world. (285)

By addressing an adult reader, Gatty immediately acknowledges that her parable is not the typical children's story. While a child reader could enjoy the absurdness of the fantastic elements, satire is normally directed at adults. To establish the framework for her satire of Darwin's ideas, Gatty prompts the adult readers to forget their complicated adult world for the moment. Nostalgic for a simpler time, a simpler world, that only children can experience, the narrator, with the adult reader as her companion, approaches a field where rooks have gathered.

The narrator immediately begins to anthropomorphize the rooks, wondering if it is a "parliament" or a "congregation" that she observes. Gatty simultaneously pokes fun at the inferior rooks while also mocking the institutions of man. The narrator challenges the intellectuals of the world "with your books and papers and diagrams, and collected facts, and self-confidence unlimited!" and who fancy they "are sitting in the supreme light of creative knowledge" (287) to tell her such simple things as what the rooks are saying and doing. "Tell me," she insistently repeats, "tell me these things, and then I

will listen to you when you point out to me the counsels and the workings of the Creator of rooks and of men" (288). Then as the narrator receives no answer, she idealizes the innocence of childhood with its acceptance of the natural world, and declares "better a thousand times to be a child as I am now, lying under this twining honeysuckle, and listening reverently to the unknown murmurs in the field" (288).

The narrator's reveries are interrupted by a voice calling out, "Gentlemen!" At first annoyed that some adult had arrived to retrieve those who wished to be "children for one brief hour of weary grown-up life," she soon realizes that it is a rook who had spoken. Bewildered, the narrator quickly accepts the fact that she can understand the birds, and grabs her tablets to record what she overhears. The fantastic has suddenly entered the parable, upsetting the expectations of both the narrator and the reader.

Oddly enough, the assembled council of rooks in the clearing are debating the origins of humankind. The main scholar among the rooks theorizes that the inferior animals known as mankind are in actuality "neither more nor less than a degenerated brother of our own race!" (296). In this parody of a scientific gathering, Gatty ridicules the

scientific theorizing of Darwin by offering evidence of the degenerated rooks' desire to regain their former state and become rooks again -- their habit of wearing clothing to replace the loss of their feathers and the blackness of their soot-covered homes and towns to recover the inferior animals' sense of identity. Acknowledging the boldness of his proposition, the rook reminds his companions that the question "If things are not so, how are they? is the ground I stand upon. For remember we have already laid down the maxim that every thing ought to be and can be explained'" (296-97). The rooks are arguing from available evidence, just as Gatty believes many materialist scientists do. Such proofs, to Gatty, are as believable as the hypotheses that Darwin offers. Her story of these rooks acts as a parody of human scientific behavior and pretensions, mocking a very adult debate.

Gatty, even in her vehement opposition to Darwin's ideas, grounds her argument in logic. In a letter to Harvey in 1860, she writes that "[s]urely common-sense and religion will do a good deal towards answering a book so utterly fantastic" (qtd. in Sheffield, Revealing 58). Yet Gatty the naturalist also applies her scientific training to the debate. Understanding the theory that Darwin offers, she also asserts that "no collection of facts, had he the

British Museum full of affinities, can prove a theory of which the direct illustrations have, according to his own showing, died out or been buried in suppositious continents at the bottom of the sea" (qtd. in Sheffield, Revealing 58). She is also aware of one of the key objections to Darwin's propositions that even recognized scientists had raised, that of missing links in the evolutionary record:

> Of course if he [Darwin] thinks that the intermediate species which would establish his argument lie there he can do so; but how can it be established as a belief? Or how can that diagram of dotted lines prove any one single thing? Surely there is a soft place somewhere in the learned man's head. (qtd. in Sheffield, Revealing 58)

Her thoughtful and rational consideration is apparent even in her disagreement with the essence of Darwin's theories.

Gatty, without directly mentioning Darwin by name, satirizes the egotism of science in her parable. The narrator occasionally interjects in her own story, commenting on the pretensions of the rooks: "The dream of nonsense is becoming real and exciting!. . . .I myself grow giddy and confused. Am I then half convinced? -- Yet for an imperfect being to hope to fathom the higher nature? Bah! What balderdash of folly!" (302). As Gillian Beer notes, Gatty exploits and satirizes Darwin's own methods of argumentation by accentuating his broad generalities and

the "concealed" anthrocentrism of his theories (Darwin's Plots, 131).

In the middle of the rook's speech, all goes quiet and the narrator looks up to find the field deserted. Even the reader as companion has vanished: "Companion, where are you? Alas! No hand is clasped in mine?" (310). The parable ends with the narrator even wondering if it has all been a dream induced by a book she had been reading prior to her walk into the fields.

Although Gatty does not restrain herself in her private letters to friends regarding Darwin's ideas, she has chosen wisely the parable form to challenge publicly the concept of natural selection. Gatty uses satire "for getting under listener's or reader's guard"; and the humor of the tale protects her from giving offense (Beer, "Parable" 197). Gatty has also found a way to enter the public discussion of a controversial issue from which women were largely excluded. She writes to Harvey, "I am not such a fool to be tussling with Darwin's or anybody's theories. I cannot suppose that I can quiz their specialities: & between Darwin and the Vestiges how am I qualified to distinguish and decide?" (qtd. in Rauch, "Parables" 147). Part of this humility reflects Gatty's personality and part of it stems from her understanding of her social position

as a woman. Gatty, though clearly holding strong opinions about many topics, felt that direct public expression of women was indecorous. In response to a speech by Frances Power Cobbe she once attended, Gatty writes, “I was interested by what was said and liked the lady who spoke. But to hear a woman hold forth in public, except when she is acting and so not supposed to be herself, is like listening to bells rung backwards” (qtd. in Maxwell 138). Gatty was content with her usually subtle advocacy of scientific theology in her parables.

Several critics have noted an underlying tension in many of Gatty’s parables that reveal competing discourses. While a story may accurately use scientific knowledge to show the miraculous complexity of a designed nature, it also often reveals a nature “red in tooth and claw,” though downplaying death and disaster to illustrate a larger moral message. Rose Lovell-Smith terms this tension as the “Gatty effect” in which a story is “vulnerable to a counter-reading, in which a God’s lack of concern or justice” for individual creatures negates any implied benevolence in Creation (63). Likewise, Tess Cosslett suggests that Gatty’s parables “often seem to be getting out of control, as the morals she tries to attach to her material do not quite fit” (“Child’s Place” 478). The opening scene of this

parable, for instance, juxtaposes a cloudless blue sky, a serene sea, and the "white-sailed vessels in the distance" with the aftermath of the receding tide, which reveals a shoreline with stranded star-fishes with the sun "streaming so pitilessly on their helpless limbs, and scorching them by its dry cruel heat" and the jelly-fishes that "had died almost at once from the shock, as the wave cast them ashore" (226). Death and destruction are natural processes even in a world filled with God's benevolence. This tension may be indicative of Gatty's own religious doubts. While seeking reaffirmation of her faith in the natural world, she most certainly encountered examples of pain and death, and as in real life, such suffering is difficult to explain or accept in light of a loving God.

In Parables from Nature, Margaret Gatty succeeded in giving the natural world an instructive voice. This world was not that of the scientific naturalist, however, stripped of moral significance. Her scientifically-grounded parables about caterpillars, zoophytes, seaweeds, and rooks show that didactic literature could be fanciful and imaginative as well as educational. Unfortunately, most of Gatty's writings appeared at the same time that the natural theology tradition was beginning to wane. Popular in the 1850s and 1860s, the allegorical nature of the parables,

however, began to yield to literature that was more engaging, superseded by children's works that were more fantastic and less overtly didactic. In order to be successful, writers of natural history had to adapt their strategies in the face of this competition.

In the next chapter, I examine one such writer who, like Gatty, was a devout Christian fascinated by the natural world -- Charles Kingsley. Kingsley, however, chooses the fantasy novel as his mode in communicating his views on natural history. In the novel written as a fairy tale, Kingsley has room to create a fantasy world filled with engaging creatures and to instruct his readers in his own views about the role of providence in evolution.

Notes

[1] Scientific materialism traces its roots to the Enlightenment with works that advocated treating the human being as a purely material entity: L'homme machine (1748) by Julien Offray de La Mettrie; Lettre sur les aveugles (Letter on the Blind) by Denis Diderot, and Systeme de la nature (1770) by Baron d'Holbach. These thinkers directly influenced scientific materialists and their works of the mid- to late-nineteenth century that focus on matter or energy being fundamental reality in the universe: Robert Chambers, Vestiges of the Natural History of Creation (1844); Charles Darwin, On Origin of Species (1859) and The Descent of Man (1871); T.H. Huxley, Evidence as to Man's Place in Nature (1863); and John Tyndall, Fragments of Science for Unscientific People (1871).

[2] Gatty's correspondence and diaries have been collected and deposited with the Sheffield City Archives.

[3] Christabel Maxwell's work is actually a dual biography of both Margaret Gatty and her eldest daughter Julianna Ewing (1841-1885), who was also a well-known children's writer in the late Victorian period.

[4] Originally, the living of Ecclesfield was held by Margaret Gatty's uncle, Thomas Ryder. On his death, his brother offered the living to Alfred Gatty for fourteen years, until his nephew came of age. Fortunately, for the Gattys, the nephew decided on a career in the army, and the Ecclesfield parish became Gatty's for life.

[5] Gatty did have some experience in her early life with writing, in association with her husband, a biography of her father, Dr. Scott, though this work did not sell well.

[6] George Johnston was a well-known Scottish physician and naturalist in the first half of the nineteenth century.

[7] Although women were permitted to attend meetings of the British Association for the Advancement of Science, for example, they could not be members, and were occasionally barred from attending some lectures due to inappropriate topics (i.e., the reproduction of marsupials) (Gates, Kindred 67).

One notable exception to women's exclusion from science was Mary Fairfax Somerville (1780-1872) who wrote a mathematical treatise, The Mechanism of the Heavens (1831), and the popularized science texts On the Connexion of the Physical Sciences (1834) and Physical Geography (1848). In 1835, she and the German astronomer Caroline Herschel (1750-1848) were the first two women to be elected to the Royal Astronomical Society.

[8] The nineteenth century saw the emergence of a distinction between outdoor field naturalists and indoor closet naturalists.

[9] Upon Gatty's death, her daughter Horatia assumed editorship of Aunt Judy's Magazine with occasional assistance from Juliana Ewing until the magazine ceased publication in 1885.

[10]According to her daughter Juliana, Gatty greatly admired and was directly influenced by Rev. William Adams's collection of "Sacred Allegories" during the 1840s. Illustrated with engravings, these children stories showed Christian teachings about sin, temptation, and "the transitoriness of life" (Katz 40).

[11] The edition referred to here is actually the illustrated giftbook edition published in two volumes in 1861 and 1865. Several illustrators contributed to the volumes, including Edward Burne-Jones, William Holman Hunt, P.H. Calderon, Charles Keene, and John Tenniel.

[12] Upon the publication of the 12th edition, the authorship of Vestiges was finally revealed to be Robert Chambers, editor and publisher of Chambers Edinburgh Journal.

[13] Although a bestseller of its day, the book was publicly denounced by clergymen, for its heresies that left no room for God's intervention, and by scientists, for its poor science based on speculative theories such as spontaneous generation.

Chapter 3

Charles Kingsley's The Water-Babies:

Providential Evolution and the Invisible World

> And yet in spite of this universal world which we see, there is another world, quite as far-spreading, quite as close to us, and more wonderful; another world all around us, though we see it not, and more wonderful than the world we see, for this reason if for no other, that we do not see it. All around us are numberless objects, coming and going, watching, working or waiting, which we see not: this is that other world, which the eyes reach not unto, but faith only.
>
> Cardinal John Henry Newman, Sermon 13, "The Invisible World" (1837)

In March 1892, a concerned five-year-old Julian Huxley wrote to his grandfather, T.H. Huxley, regarding an unusual creature he had recently seen illustrated in a children's book: "Dear Grandpater—Have you seen a Waterbaby? Did you put it in a bottle? Did it wonder if it could get out? Can I see it some day?" (qtd. in Irvine 338). Young Julian's eager, successive questions illustrate the child's wonder and imagination that this fantastical creature had stimulated. Charles Kingsley had actually created this water-baby thirty years earlier in his novel The Water-Babies: A Fairy Tale for a Land-Baby (1863), originally written for another young boy, Kingsley's then four-year-old son, Grenville Arthur.

What had particularly attracted Julian's attention was an illustration by Linley Sambourne in the 1886 edition of the novel, a small quarto in blue cloth gilt with one hundred wood engravings. Caricatures of two Victorian scientific rivals -- the comparative anatomist, Richard Owen, and the scientist-lecturer, T.H. Huxley -- closely examine through a magnifying glass a water-baby captured in a specimen jar. The corresponding passage in the novel about the discovery of the creature refers not only to the two men's professional rivalry but also to their intense scientific desire to explain the natural world:

> But they [the discoverers] would have put it [the water baby] into spirits, or into the Illustrated News, or perhaps cut it into two halves, poor dear little thing, and sent one to Professor Owen, and one to Professor Huxley, to see what each would say about it. (77-78)

In response to his grandson's earnest inquiries, Huxley avoided dampening the boy's curiosity and imagination by composing an encouraging yet ambiguous reply:

> My dear Julian, I never could make sure about that water baby. . . .[Kingsley] was a very kind man and very clever. Perhaps he thought I could see as much in the water as he did--there are some people who see a great deal and some who see very little in the same things. When you grow up I dare say you will be one of the great-deal seers and see things more wonderful than water babies where other folks can see nothing. (qtd. in Irvine 338)

Huxley's words echo one of the main themes of Kingsley's novel about the visible and invisible worlds around us. Huxley, the scientist, was most concerned about using science to reveal the empirical workings of nature. Using the context of a children's fantasy, however, Kingsley makes visible the invisible of both worlds -- the empirical and the spiritual, intending to show that the connection between science and religion was such that advancements in one would strengthen our understanding of the other. He had "first accepted the truth of Christianity and then accepted science as revealing material manifestations of that truth" (Uffelman 74). This brand of natural theology differs from that of Margaret Gatty in that she, while a firm advocate of the scientific method, was still a believer in the traditional view of biblical creation. Kingsley, on the other hand, was a sympathetic follower of Darwin's ideas about natural selection, albeit with his own particular interpretation that fit his beliefs about a divinely planned universe.

In this chapter, I first describe Kingsley's vocations as a clergyman and as a writer, showing how one role complemented the other, particularly in his social reform fiction. Next, I discuss how Kingsley reconciled his religious beliefs with Darwin's ideas about natural

selection and evolution. In light of this personal and intellectual background, I then proceed to analyze his children's novel The Water-Babies: A Fairy Tale for a Land-Baby (1863). In this fairy tale, Kingsley uses fantasy to highlight his own modification of Darwin's theory of natural selection, showing that divine providence guides both physical and moral evolution.

The Social Reformer

Born July 12, 1819, Kingsley was the son of the Rev. Charles Kingsley, vicar of Holne in Devon, and Mary Lucas, daughter of a Barbados sugar plantation owner. Educated at King's College, London, and Magdalene College, Cambridge, Kingsley had originally intended to study law rather than religion, partly in response both to the puritanical restrictions of rectory life in his own childhood and to the endless fuss of church business his father had faced. Kingsley's early college days were reckless and idle; freed from the restraints of his evangelical parents, he explored a life of drinking and gambling. In fact, the independence he experienced at Magdalene College exacerbated his religious doubts. He began a period of intense soul-searching during the religious uncertainty of 1830s and 1840s, an uncertainty due to the various conflicts between

new discoveries in science and the Biblical account of Creation. This period of tormented mental questioning shook his faith, but he was able to reconcile eventually the carnal life with the spiritual with the help of his future wife. In 1839, while on vacation after his first year at Magdalene, he met Fanny Grenfell with whom he fell almost immediately in love. The devout Fanny helped Kingsley place a spiritual emphasis in his life, with his eventually curtailing hunting and driving, and giving up cards. To his future wife, Kingsley vowed, "Everything I do, in my studies, in my plans, in my actions is now and shall be done in reference first to God, and then to you" (Letters 17). Despite initial opposition from Fanny's family due to Kingsley's lack of funds, they married in 1844. In the same year, Kingsley was appointed rector of Eversley Church in Hampshire.

One of the most important influences on Kingsley's early life as a clergyman was his association with the English theologian Frederick Denison Maurice (1805-1872). As a young man, Kingsley had been greatly influenced by The Kingdom of Christ (1838) in which Maurice argues that politics and religion are inseparable and that the church should be involved in addressing social questions. Rejecting individualism, with its accompanying competition

and selfishness, Maurice suggests a socialist alternative to the economic principles of laissez faire. Kingsley was affected by the growing social unrest of the working poor in the 1840s and was deeply sympathetic to the hunger and poverty that had initiated the Chartist movement. He felt that attempts at political reforms alone would not be sufficient to bring about social change. In April 1848, for instance, responding to the House of Commons' rejection of the most recent Chartist petition, Kingsley saw immediate applications of Maurice's philosophy in the plight of the working class. He thus joined with Maurice and Thomas Hughes (1822-1896), author of Tom Brown's Schooldays (1856), to form the Christian Socialist movement to discuss how the Church could help prevent revolution while at the same time addressing the grievances of the working class.

In addition to writing various Christian socialist tracts and articles for the Christian Socialist movement, Kingsley translated his desire for social reforms for the working class into two of his early novels. In 1848, Fraser's Magazine began publishing Kingsley's social reform novel Yeast, A Problem, which was concerned with the deplorable living conditions of England's agricultural laborers. He followed this work in 1850 with another reform novel, Alton Locke, Tailor and Poet. Purportedly the

autobiography of a working class Chartist poet, the novel attempts to expose dreadful working conditions of tailors in London's West End by tracing the story of a young tailor who aspires beyond his working class background to become a poet.

After Alton Locke, Kingsley switched to historical fiction with Hypatia; or, New Foes with an Old Face (1853) and Westward Ho! (1855). The former, set in fifth-century Alexandria during the collapse of the Roman Empire, tells the story of a philosophy teacher murdered by fanatical Christians because of her political and religious ideas while the latter, set in Elizabethan times, follows the adventures of the hero Amyas Leigh as he heads to sea with Sir Francis Drake. In 1856, Kingsley wrote The Heroes; or, Greek Fairy Tales for My Children, a retelling of classical stories which marks his beginning interest in writing for children. Kingsley followed his children's work with Two Years Ago (1857), a novel about how poor sanitary conditions and public apathy combine to cause an outbreak of cholera in his contemporary Victorian period. In 1865 Kingsley published his final novel serially in Good Words; it was later published in two volumes as Hereward, The Last of the English (1866). Here, in a heavily researched and footnoted novel, he marks the passing of the Anglo-Saxon

heroic age as the last Anglo-Saxon holdout against the Normans succumbs to William the Conqueror.

In addition to being a novelist and clergyman, Kingsley was a committed naturalist and author of several books on marine biology and geology. In 1855, Kingsley expressed his growing interest in natural history by publishing an article in the North British Review titled "Wonders of the Shore," which would later be expanded and published as Glaucus: or, The Wonders of the Shore (1855). His other main volume-length natural history works are The Water-Babies (1863) and Madam How and Lady Why; Or, First Lessons in Earth Lore for Children (1869). As a clergyman and as a natural historian, Kingsley hoped that one day "every candidate for ordination should be required to have passed creditably in at least one branch of physical science" (Letters 347). He felt that "in investigating the physical forms of nature and the material laws which governed it, man was exploring the very methods, of God, who was Himself the supreme scientist" (Manlove, Christian Fantasy 185).

During Kingsley's later years, he concentrated his energies on his sermons and his teaching, serving in positions that provided both satisfactory income and prestige for him. In 1860, Kingsley was appointed Regius

Professor of Modern History at Cambridge, a position he held for nine years. At Queen Victoria's request, in 1861, he also served as a private tutor to the Prince of Wales, the future Edward VII. He became a canon first at Chester Cathedral in 1870 and then at Westminster Abbey in 1873. In ill health after a lecture tour to America, Kingsley contracted in pneumonia and died at Eversley on 23 January 1875.

Kingsley and Evolution

In this section, I focus on Kingsley's natural history interests and his response to Darwin's theory of natural selection. Enthusiastic about the practical advances science was making to benefit mankind, Kingsley was also optimistic throughout his life about what religion and science could accomplish in concert. As early as his 1846 lecture "How to Study Natural History," Kingsley comments confidently on the ability of science to expand our knowledge of nature while at the same time reinforcing rather than contradicting God's word:

> I have watched scientific discoveries which were supposed in my boyhood to be contrary to revelation found out one by one to confirm and explain revelation, as crude and hasty theories were corrected by more abundant facts, and men saw more clearly what the Bible and Nature really did say; and I can trust that the same process

> will go on forever, and God's earth and God's word will never contradict each other. (Scientific Lectures 304)

With such an open-minded view of science, Kingsley was quite receptive to Darwin's 1859 publication of On the Origin of Species. Darwin sent Kingsley a copy of the first edition, and in his letter of thanks, Kingsley was full of praise: "All I have seen of it [the book] awes me, both from the heap of facts and the prestige of your name, and also with the clear intuition, that if you be right, I must give up much that I have believed and written" (qtd. in F. Darwin 81). Unlike many of his fellow clergymen, Kingsley had little problem with the idea of natural selection, seeing the process as still being divinely ordained. Darwin, likewise, was so pleased with such an effusive endorsement from a man of the Church that he referred to Kingsley's letter in the last chapter of the second edition of the Origin, published just two months later:

> A celebrated author and divine has written to me that he 'has gradually learnt to see that it is just as noble a conception of the Deity to believe that He created a few original forms capable of self-development into other and needful forms, as to believe that He required a fresh act of creation to supply the voids caused by the action of His laws.' (567)

Kingsley was certainly not the only clergyman sympathetic to Darwin's ideas, but he was one of the most prominent and most vocal.

Despite the popular image of religion and science being antagonistic forces, Kingsley saw that the two institutions actually share a common characteristic -- faith. For religion, it is faith in a higher, unseen power; for science, it is faith in universal laws. He eagerly embraced evolutionary biology as a great gift, one that allowed theology to express its understanding of God in fresh and fertile ways. In a letter to the naturalist Henry Walter Bates (1825-1892), Kingsley describes that he had come to appreciate this view of life as

> Utterly wonderful. . .because it looks most like an immense chapter of accidents, and is really, if true, a chapter of special Providences of Him without whom not a sparrow falls to the ground, and whose greatness, wisdom and perpetual care I never understood as I have since I became a convert to Darwin's views. (Letters 175)

Like Gatty, Kingsley had accepted the essence of William Paley's natural theology, believing that the unmistakable evidence of design in nature offered irrefutable proof for the existence of God. To him, design was evident wherever he saw order, stability, and lawfulness in nature. The only alternative to design, of course, was chance. The use of the term "chance" in any scientific theory is not,

strictly, a statement about causation (or lack of causation); rather, it is a statement about our lack of knowledge about causation. Events which appear random from the human perspective may actually have a cause from a divine, transcendent perspective. In Kingsley's interpretation, God's design could then serve as an epistemic foundation for a scientific explanation of the adaptation of phenomena to their environment. Thus, if Darwin's theories about natural selection and mutation of species are true, they must be an expression of God's superintending providential design, or in other words, providential evolution.

Several types of religious response appeared upon the publication of Darwin's Origin,[1] but the one that most concerns me here is that of providential evolution, held by liberal, sympathetic Anglicans such as Kingsley. Until the early nineteenth century, much of British society had still placed its faith in the Mosaic cosmogony and in the belief of a relatively recent Creation performed by God in the scriptural six days.[2] Historically, the term providential evolution refers to an ecclesiastical doctrine that emerged between 1859 and 1884.[3] Before 1859, the Anglican leadership of the Church had believed that humankind and the rest of nature had been created in one act or in a finite number of

acts of special creation. Once created in their current forms, all species had remained unchanging. Darwin's theory challenged this belief by arguing that species do not have a fixed, static existence but exist in states of change and flux operating through the mechanism of natural selection.

Liberal thinkers such as Kingsley had no real difficulty in surrendering literal interpretations of the Bible, but they held fast to the argument from design. They believed it possible to harmonize some form of evolution, by whatever mechanism, with their creationist commitment to the presence of intelligent design in nature. According to Gregory Elder, the Anglican Church was able to create a "synthesis of science and the biblical affirmation of divine creation" (4). Elder refers to Cardinal Newman's term "chronic vigour," the ability of a doctrine "to remain essentially the same while undergoing a large degree of conceptual change over a period of time" (4). In other words, in both the older and newer views of creation, God created the world but the means by which this was done differed greatly. Creation became a continual process rather than a one-time, special act.

As Darwin's notoriety grew, however, Kingsley clearly saw the dilemma the new scientific theories were producing in many of his contemporary clergymen. In April 1863,

writing to his friend Frederick Denison Maurice, Kingsley describes that "Darwin is conquering everywhere, and rushing in like a flood, by the mere force of truth and fact. The one or two who hold out are forced to try all sorts of subterfuges as to fact, or else by evoking the odium theologicum [theological hatred]" (Letters 171). He concludes that "now that Huxley, Darwin, and Lyell have gotten rid of an interfering God -- a master Magician as I call it -- they have to choose between an absolute empire of accident and a living, immanent, ever working God" (qtd. in Paradis 162). The "subterfuges as to fact" most likely refers to the publication of Omphalos: An Attempt to Untie the Geological Knot[4] (1857) by Kingsley's friend and fellow naturalist Philip Henry Gosse (1810-1888). In an attempt to reconcile the immense geologic ages evidenced by the fossil record with the biblical account of creation, Gosse argues that fossils serve as a special act of creation to make the world appear older than it is. Likewise, Gosse also explains why Adam, who had no mother, would have had a navel. Even though Adam had no need for a navel, God gave him one anyway, creating a false history of human ancestry in order to make Adam seem an accurate "template" for all subsequent humans. When asked to review Gosse's book,

Kingsley politely refused but wrote to his friend in explanation:

> Shall I tell you the truth? It is best. Your book is the first that ever made me doubt, and I fear it will make hundreds do so. Your book tends to prove this -- that if we accept the fact of absolute creation, God becomes Deus quidam deceptor [God who is sometimes a deceiver]. I do not mean merely in the case of fossils which pretend to be the bones of dead animals; but in the one single case of your newly created scars on the pandanus trunk, your newly created Adam's navel, you make God tell a lie. It is not my reason, but my conscience which revolts here. . .I cannot believe that God has written on the rocks one enormous and superfluous lie for all mankind. (Letters 132)

Kingsley disapproved of attempts to explain nature and man's place in it that ignored or, even worse, distorted facts to justify religious belief.

Kingsley was an unusual thinker in that he openly faced many of the philosophical and spiritual debates circulating in regard to new scientific discoveries, yet his purpose was to shape his own version of natural theology. In the same letter to Maurice mentioned earlier, Kingsley informs his friend that he is working hard "at points of Natural Theology, by the strange light of Huxley, Darwin, and Lyell" (Letters 171). He wanted the latest scientific ideas to inform his beliefs, seeing evolution "as a concrete expression of God's outpouring life-force moulding and re-creating Nature" (Prickett 168). Hence,

Kingsley actively enters into debate with Darwin, not just blindly accepting or rejecting the scientist's theories. Ultimately, though, he recognizes that science can "heighten rather than diminish our sense of God's presence in nature" (Manlove, Christian 185). The debate with Darwin's ideas best materializes in Kingsley's fantasy The Water-Babies. The novel incorporates many of the leading scientific issues of the time, albeit presented in a moderate Christian context following a fairy-tale format. In the next section, I argue that Kingsley adapts Darwin's ideas to a fantasy context in order to advocate the interdependence between physical and moral evolution. Fantasy entertains his child readers while at the same time insuring that his unorthodox synthesis of natural theology and providential evolution does not offend adult readers.

The Water-Babies as Scientific Fairy Tale

In a well-known yet certainly exaggerated story recounted by his wife, Fanny, Kingsley wrote The Water-Babies: A Fairy Tale for a Land Baby in 1862 for his youngest son, Grenville, upon his wife's reminder that "Rose, Maurice, and Mary have got their book [The Heroes], and baby must have his" (Letters 137). Kingsley accordingly left the breakfast table and went to his study, emerging a

half hour later with the first chapter of the novel completed.

The Water-Babies begins in the real world of Victorian Yorkshire. Tom, a young chimney sweep employed by the brutal Mr. Grimes, accompanies his master to clean the chimneys at the squire's residence, Harthover House. The boy becomes lost in the cramped labyrinth of chimneys and mistakenly descends the wrong one, finding himself in the pristine bedroom of the squire's daughter, Ellie. Awakening, the young girl screams at finding a black, sooty boy in her room and alerts the entire house. Equally frightened, Tom jumps out of a window, running across the estate with much of the household in pursuit. He eventually loses his pursuers, but in his desperate race through the woods and into the valley of Vendale, he falls ill. In a fevered state, the soot-blackened Tom falls into a nearby stream and drowns.

Here, the novel segues into the fantasy mode because Tom only appears to die in the stream. Instead, he sheds his dirty, outer husk and finds himself transformed by the Queen of the Fairies into a water-baby, a tiny amphibious humanoid about 3.87902 inches long and having "about the parotid region of his fauces a set of external gills" (76). The setting of the story changes to an underwater

environment as Tom begins his journey alone along the stream and down to the ocean, undergoing a series of adventures, each with its own moral lesson. Once he proves himself a moral creature by saving a lobster caught in a trap, Tom joins the community of other water babies who are watched over and taught by the fairy sisters, Mrs. Bedonebyasyoudid and Mrs. Doasyouwouldbedoneby. Coincidentally, his moral lessons at this stage of the novel are conducted by Ellie, the squire's daughter, who has since died in an accident; each week she visits him, and then each Sunday she returns to heaven. In the last stage of his moral development, Tom must do that which he does not wish to do -- find his old master, Grimes, who drowned while poaching. Tom discovers Grimes imprisoned in a smokestack within the purgatory-like region called the Other-End-of-Nowhere. When Grimes repents and accepts responsibility for his punishment, he progresses to the next stage of his punishment -- sweeping Mt. Aetna. By proving his willingness to do things he does not like, Tom has earned himself a return to human form, and becomes "a great man of science" who "can plan railways, and steam-engines, and electric telegraphs, and rifled guns, and so forth" (229-30).

Before delving into any analysis of the novel itself, I first wish to foreground my discussion with an account of the novel's publication history, critical and popular reception, and generic issues. Like many children's stories, then and now, The Water-Babies was intended as much for the adults who read it aloud as it was for children. This dual audience can be seen in the simple fact that the original story was first printed serially in Macmillan's Magazine from August 1862 to March 1863. In an 1862 letter to his friend James MacLehose, Alexander Macmillan writes, "We are to have such a story. . .for the Magazine. . .It is to be called 'The Water-Babies.' I have read a great deal of it, and it is the most charming piece of grotesquery, with flashes of tenderness and poetry playing over all, that I have ever seen" (qtd. in Uffelman and Scott 123). Oddly enough, the serialization of Kingsley's fantasy appears during the same time period in Macmillan's as poetry by Christina Rossetti, a theosophical essay by Matthew Arnold, and various political and economic pieces. Not only is the fact that a children's novel was first published in such a general, adult-targeted magazine unusual but also the novel is filled with contemporary religious, educational, political, and scientific references that only adults would be likely to understand.

An anonymous contemporary reviewer for The Spectator comments on Kingsley dedicating his book to his young son, Grenville Arthur:

> If he [Grenville] understands the joke about the Gairfowl's objecting to marrying his deceased wife's sister, about the whales 'butting each other with their ugly noses day and night from year's end to year's end,' like 'our American cousins,' -- about the abolition of the Have-his-carcase Act,' and the 'Indignation Meetings,' -- or the Backstairs way out of Hell, or the Hippopotamus major in the brain, -- or a hundred others, we will pronounce Mr. Kingsley's tale a good fairy tale for children. ("Mr. Kingsley's Water-Babies" 567)

For this very reason, these topical references to contemporary adult issues of Kingsley's time are often eliminated in modern editions of the novel catering to a strictly child audience. Likewise, a writer in The Westminster Review suggests, "It [Water-Babies] is complained of as unsuited to the capacity of the good little boys to whom it is dedicated" (qtd. in Harper 120) due to the novel's extensive use of satire, a literary technique primarily aimed at adults. The reviewer softens his assessment, however, by adding, "but we believe the children will find quite as much that they can understand as they ever find in any book that is worth putting into their hands, and quite as much probably as will be revealed to the understanding of most grown-up folks." Even if a

child reader fails to grasp fully all the topical references, this reviewer implies, the story itself will entertain with Tom's continual adventures.

The critics' and the readers' reception of The Water-Babies was further complicated by the differences between the serial and book publications. Since serial publication can sometimes result in problems with narrative coherence, Kingsley took the opportunity of book publication in the summer of 1863 to revise his original text. First, the book version added limited illustrations -- eight wood-engraved chapter-initials by Robert Dudley as well as a tinted lithograph frontispiece and a lithographic illustration by J. Noel Paton. Kingsley introduces each chapter with a quotation from a poem by Longfellow, Spenser, Coleridge, or Wordsworth, whose theme complements the overall themes of the novel. In terms of the text itself, Larry Uffelman and Patrick Scott count approximately one hundred and sixty alterations, ranging from minor revisions -- a change in word order or "the clarification of the sense of a passage" (124) -- to major ones -- the addition or deletion of entire passages.

Some revisions are particularly relevant to a child reader, "softening language which his [Kingsley's] readers might have found offensive" (124). In the serial text, for

instance, when commenting about what we can know to be true, Kingsley writes that “rogues say, and fools believe” that spirits can make tables dance. In the book text, “rogues” and “fools” become “foxes” and “geese” (83), reminiscent of the beast fable for children. For adult readers, he also adds the allegorical Isle of Tomtoddies as criticism of the test-dominated school system that allowed little room for imagination. On this island, men, women, and children have been turned into turnips and radishes and are cramming their heads with pointless facts in anticipation of the coming of the Examiner.

One final significant addition to the book publication is the character of the Irishwoman, who we eventually learn is actually the Queen of the Fairies. Kingsley introduces her in the first chapter when Grimes and Tom meet her on their way to Harthover House. When they briefly stop at a stream, Tom observes Grimes wash his face and neck from the stream, amazed at this sight. The Irishwoman, who knows their names without their telling her, then provides the clue to one of the book’s themes and to Tom’s own journey: “Those that wish to be clean, clean they will be; and those that wish to be foul, foul they will be. Remember.” (50). Tom will utter these same words before he falls into a stream in his fevered state. Kingsley adds the mysterious

and all-knowing Irishwoman to represent “the underlying, ever-present reality of the spiritual realm” (Uffelman and Scott 129). Her addition to the beginning of the story also unifies the narrative that will continue with the Queen of the fairies and her attendants watching over Tom.

As we can see, Kingsley wrote this seemingly nonsensical children’s story fully aware that it would also be read by adults. Yet children were the primary audience Kingsley had in mind. Knowing that children's literature shaped youthful ideals and morals, he wished to provide a story intended to direct the child to proper behavior while at the same time making “morality and science and history and geography into an imaginative experience for children" (Leavis 156). The anonymous contemporary reviewer in The Spectator goes even further, declaring the pedagogical purpose of the book is to “adapt Mr. Darwin’s theory of the natural selection of species to the understanding of children by giving it an individual, moral and religious as well as a mere specific and scientific application” (“Mr. Kingsley’s Water-Babies” 567).

Kingsley does not possess a simplified view of the world; he describes himself as “the strangest jumble of superstition and of a reverence for scientific induction. . . .a mystic in theory and an ultra-materialist in practice”

(Letters 19). Colin Manlove, in his Christian Fantasy, offers the idea that Kingsley's deep division within himself between the supernaturalist and the scientist were the impetus for his attempt to unite the two sides in his fantasy by showing a redemptive side to evolution (184). In the summer of 1862, Kingsley wrote to Maurice that in his fantasy novel he had tried

> in all sorts of queer ways, to make children and grown folks understand that there is a quite miraculous and divine element underlying all physical nature; and that nobody knows anything about anything, in the sense which they may know God in Christ, and right and wrong. (Letters 137)

In the close study of nature, Kingsley finds "absolute Divine miracle at the bottom of all" (Letters 67). The Water-Babies is a thoughtful exploration of the moral and religious dimensions of evolutionary thought. It begins with a familiar fairy tale opening: "Once upon a time there was a little chimney-sweep, and his name was Tom" (43). Despite this traditional beginning, the tale does not take place long, long ago or far, far away as so many fairy tales do. In contrast, much of The Water-Babies is set in a fantasy world that exists simultaneously to ours, a world present but unseen. The semi-magical underwater world of the stream and the ocean is part of our real world. Tom can only understand the animals he encounters on his journey

due to his transformation into a water-baby, a fairy creature. Only in his final odyssey to the Other-End-of-Nowhere does Tom enter a world outside our reality; in fact, the last part of the novel is the most allegorical and least realistic.

Reminiscent of the little chimney sweep Tom Dacre from William Blake's Songs of Innocence, Kingsley's Tom has lived a harsh life as a chimney sweep, brutalized by his often drunk master, Grimes.[5] In Blake's "The Chimney Sweep," the boy dreams of running down a green plain, laughing, and cleansing himself in a river to remove the thick chimney soot and his life's burdens. He and his fellow sweeps would "Then naked & white, all their bags left behind" (17) rise to Heaven and then Tom would "have God for his father & never want joy" (20). Kingsley's Tom is also presented as unloved and ignorant of cleanliness, virtue, even God. An unschooled chimney sweep, Tom "could not read or write, and did not care to either; and he never washed himself. . . . He had never been taught to say his prayers. He had never heard of God, or of Christ" (4).

Left alone, Tom's moral and social development would likely have followed that of his main role model, Mr. Grimes. In some of his sadder moments of his chimney sweep existence, Tom would even think of his future:

> of the fine times coming, when he would be a man, and a master sweep, and sit in the public-house with a quart of beer and a long pipe, and play cards for silver money, and wear velveteens and ankle-jacks, and keep a white bull-dog with one grey ear, and carry her puppies in his pocket, just like a man. And he would have apprentices, one, two, three, if he could. How he would bully them, and knock them about, just as his master did to him; and make them carry home the soot sacks, while he rode before them on his donkey, with a pipe in his mouth and a flower in his button-hole, like a king at the head of his army. (44)

Tom has accepted his lot in life, not understanding the social injustice behind it, yet holding out for an existence in which one day he would take Mr. Grimes' place and repeat the cycle with another apprentice. Fortunately, Kingsley's tale is one of spiritual redemption for young Tom. Tom's life has been harsh, and he has been treated as less than human, but the novel gives hope in that intervention will show his potential.

Similar to Blake's Tom who dreams of cleansing himself in a river and becoming "naked & white" (17), thus capable of joining the angels, Kingsley's Tom desires to be clean. But first he has to recognize his current moral state. When Tom mistakenly descends the wrong chimney and finds himself in Ellie's bedroom, the cleanliness of the room amazes him. He even frightens himself when he catches his own reflection in the mirror and "for the first time in his

life, he found out that he was dirty; and burst into tears with shame and anger" (56).

Later, after being chased by the entire household, Tom feverishly stumbles to a nearby stream. Repeating the words "I must be clean" (69), he enters the water and seemingly drowns. Kingsley's description is very subtle as many readers initially miss that, at least in one sense, the poor boy has died. The squire and his men when searching for the boy only find

> a black thing in the water, and said it was Tom's body, and that he had been drowned. They were utterly mistaken. Tom was quite alive; and cleaner and merrier, than he ever had been. The fairies had washed him, you see, in the swift river, so thoroughly, that not only his dirt, but his whole husk and shell had been washed quite off him, and the pretty little real Tom was washed out of the inside of it, and swam away. . .(83)

Metamorphosis was a favorite metaphor for death during the Victorian period, and Kingsley uses it liberally in his own writing: Tom metamorphoses into a water-baby, a caddis worm into a caddis fly, and so forth, all leaving empty shells behind them while their true selves continue in a new body. While the metaphor allows the religious to hope for their own translation into "higher" modes of being, Kingsley also uses it as an example of Nature's economy, in which material is continually being translated into other shapes

and modes (Wood 242). The theme of metamorphosis is as old as the Roman poet Ovid, who writes, “Nothing retains its own form; but Nature, the great renewer, ever makes up forms from other forms” (252-53). This process of renewal allows Tom a second chance to evolve, morally and physically, an opportunity that he never had in the service of the uncaring Mr. Grimes.

In addition to the themes of metamorphosis and evolution, the novel also integrates key ideas borrowed from Darwin and other scientists, including recapitulation, degeneration, and extinction. Although supportive of the scientific progress associated with Darwin, Huxley, and Lyell, Kingsley believed that religion and science would have to join forces to find a post-Darwinian equivalent to natural theology. As Gillian Beer notes, “he [Kingsley] grasped much of what was fresh in Darwin’s ideas while at the same time retaining a creationist view of experience” (129). Unlike Gatty, Kingsley accepts natural selection, but he also cannot surrender the concept of a guiding divine presence. For him, evolution must have meaning and purpose, two attributes that Darwin had tried to eliminate from his own theory.

Kingsley attempts to identify purpose in evolution through recapitulation, for example, as seen in Tom’s

physical development once he has been transformed into a water-baby. German morphologist Ernst Haeckel (1834-1919) had shaped recapitulation into what he termed the "biogenetic law":

> the History of the Germ is an epitome of the History of Descent; or, in other words: that Ontogeny is a recapitulation of Phylogeny . . . the series of forms through which the Individual Organism passes during its progress from the egg cell to its fully developed state, is a brief, compressed reproduction of the long series of forms through which the animal ancestors of that organism (or the ancestral forms of its species) have passed from the earliest periods of so-called organic creation down to the present time. (6—7)

Although long since refuted by modern biologists, Haeckel's theory posits that the embryological development of an organism follows the same path as the evolutionary history of its species. In other words, the development of advanced species passes through stages -- fish, reptile, mammal, for example -- represented by adult organisms of more primitive species. Tom's physical transformation into a water-baby resets his evolutionary process -- he is now a salamander-like organism with gill-slits. Whereas Darwin's theories depicted evolution as random natural processes and implied humans were the latest accident of such randomness, recapitulation gave back what the theory of evolution seemed to deny -- the distinction of humanity and the

teleological nature of its development. As Jessica Straley argues,

> Recapitulation thus provided a panacea for evolutionists and anti-evolutionists alike. The former mined embryological development for illumination of the murkier links in the chain of human descent, and the latter took comfort that both the growth of the individual and the rise of the species exalted man as their predetermined apex. (588)

Kingsley, in essence, uses recapitulation to appease both viewpoints.

In addition to drawing on the latest biological theories for his fantasy, Kingsley also borrows ideas from education. Herbert Spencer (1820-1903), probably best known for extending evolution into the field of sociology with "social Darwinism," also wrote extensively on education. In his work Education: Intellectual, Moral, and Physical[6] (1861), Spencer argues that nature alone should teach the child just as it had taught the species, similar to the natural education that Rousseau had advocated in the previous century. He urges that "children should be led to make their own investigations, and to draw their own inferences. They should be told as little as possible, and induced to discover as much as possible" (124). Nature's violence had always been, according to Spencer, a powerful force in the species' education, thus an impetus to

survival of the fittest. Children should not be protected from self-endangerment, such as sticking a hand into a flame, because only "the burnt child dreads the fire" (176). The impetuous act teaches the child "that there are rewards and punishments in the ordained constitution of things" (92). Spencer's philosophy also reflects the idea of recapitulation, only here it is the child who reflects the various stages of humanity -- from beast to civilized human -- as it undergoes its moral development. The child's attainment of humanity depends on his or her "self-motivated observations of and experiments within nature" (Straley 587).

This Spencerian philosophy is immediately evident upon Tom's transformation into a water-baby. Reborn in his new amphibious form, Tom forgets his previous existence and revels in the underwater world as he navigates his new world. Seemingly alone, Tom learns right from wrong through his observations and his mistakes; not only is he forced to begin again his physical evolution but also his moral evolution must commence. In the stream, Tom encounters minnows, caddis-flies, dragonflies, otters, and trout -- all creatures naturally found in river environments, though these particular inhabitants -- similar to those in Gatty's parables -- have now been anthropomorphized. Life in the

water is unconfined, and he is allowed to exercise his natural curiosity. When that curiosity, however, leads him to break open the door to the caddis fly's house, the other caddises chastise him for destroying the cocoon and preventing the caddis from transforming into a winged insect. Tom quickly learns the serious consequences of his careless actions and "was very much ashamed of himself and felt all the naughtier" (91). After his initial missteps in behavior with mistreating the caddis-flies and teasing the trout, however, Tom gradually learns to be kind and compassionate to others.

Aside from his initial physical change to a water-baby, the changes that Tom undergoes are linked to his own self-creation: through moral choices, he creates himself along his journey to manhood. As Kingsley writes, the "doctrine of this wonderful fairy tale is, that your soul makes your body, just as a snail makes his shell" (88). Kingsley combines moral growth with physical changes in the body, thus showing how morals manifest themselves physically, leading to the final judgment of the soul. Kingsley juxtaposes the growth of the child with that of other natural creatures:

> Does not each of us, in coming into this world, go through a transformation just as wonderful as that of a sea-egg, or a butterfly? And do not

> reason and analogy, as well as Scripture, tell us that that transformation is not the last? And that, though what we shall be, we know not, yet we are here but as the crawling caterpillar, and shall be hereafter as the perfect fly. (82-83)

Tom now must become master of his own spiritual progress. The fairies are ordered by their Queen to watch over him but not to reveal themselves to Tom, even though they "longed to take him, and tell him how naughty he was, and teach him to be good" (90). Tom is free to explore the world around him.

With Tom's physical transformation, the setting changes to a normally unseen yet wondrous world that co-exists alongside of reality. Jonathan Padley, unlike many critics of The Water-Babies, sees Tom's underwater adventures merely as an extension of the realism of the first chapter rather than as the beginning of the fantastical narrative (57). Beneath the water, Tom observes the behavior of the underworld society where the salmon are "the lords of the fish, and we [the otters] are the lords of the salmon" (99). The underwater class system is not so very different from that of Tom's old life with an eat-or-be-eaten hierarchy. Tom must navigate his new world on his own without any overt guidance. As part of his moral transformation, Tom must begin learning about the world and about his own behavior and its consequences. The Queen of

the Fairies warns the other fairies not to reveal themselves yet to Tom on his journey as he “is but a savage now, and like the beasts which perish” and “from the beasts which perish he must learn” (70). Those people who do not continue on the journey of self-improvement are punished with ambiguity of form: "they will remain neither boys nor men, neither fish, flesh, nor good red herring" (114). While Kingsley does not definitively identify what happens to those who fail on this journey, he does indicate that they will not return to human form.

When Tom finally comes to the sea, he asks every creature he encounters -- bass, sea snails, a sunfish, porpoises, and a lobster -- if they can help him find the water-babies. With the guidance of the invisible fairies, Tom eventually arrives at St. Brandan’s Isle, the home of the water-babies, and learns that water-babies were formerly children “whom the good fairies take to” (147) because they had been mistreated or had died of preventable diseases. Tom is rewarded at the end of the first journey with the love and companionship of the other water-babies and the two fairies, Mrs. Doasyouwouldbedoneby and Mrs. Bedonebyasyoudid, who care for the water-babies and guide their moral education. Tom’s period with the water babies is a time of moral training, "often painful as willfulness

and selfishness have to be purged from him" (Avery 49). Although Tom has spiritually evolved enough to join the water-babies, he is still learning and growing.

In presenting his views in the novel, Kingsley takes the unusual approach of creating female fairies who represent the creative and moral forces in nature. Besides the Queen of the Fairies, who was the Irishwoman in disguise, the novel includes three other powerful females: the fairy Mrs. Bedonebyasyoudid, who represents an Old Testament type of Justice; her sister, Mrs. Doasyouwouldbedoneby, the New Testament view of Compassion; and Mother Carey, the fount of Creativity in nature. Representing natural principles at work in the world, these three females -- part mothers, part deities -- are guiding feminine spirits for Tom.

Jacqueline Labbe argues that such female entities as Mother Carey, Mrs Doasyouwouldbedoneby, and Mrs Bedonebyasyoudid, with their feminine virtues of love, compassion and inherent knowledge, are more important than the more masculine qualities of discipline and self-sacrifice in the divine order. In an age of increasing religious doubt, Kingsley deliberately chooses not to invoke God or Christ; instead, his “re-presenting the Father as a Mother lends familiarity and safety to an image

otherwise receding further into intellectual distance" (99). The mother or grandmother image in such fantasies as The Water-Babies can temper their moral lessons with compassion "instead of demanding fealty" from their worshippers (101).

The first powerful female Tom meets is Mrs. Bedonebyasyoudid -- a "gnarly, and horny, and scaly, and prickly" female (157) -- who is the ugliest fairy in the world and "shall be, till people behave themselves as they ought to do. And then [she] shall grow as handsome as [her] sister" (153). She is no mere abstraction, though, as she works on scientific and dynamic principles and "is the motor at the centre of the natural order" (Manlove, Christian 188). She is a stern figure of justice who rewards and punishes the water-babies according to the principle by which she is named. When Tom is naughty and feeds a pebble to a sea anemone, Mrs. Bedonebyasyoudid gives him a piece of candy which is immediately transformed into a stone once he pops it into his mouth. When he finds her supply of candy that she gives out as rewards, he greedily eats it all, and his guilty conscience punishes him, for "when Tom's soul grew all prickly with naughty tempers, his body could not help growing prickly too" (164). When he asks Mrs. Bedonebyasyoudid how he can remove

the prickles, she replies, “You put them there yourself, and only you can take them away” (164).

Mrs. Bedonebyasyoudid may seem stern and cold but she operates in the same way as a dispassionate Nature:

> ’I cannot help punishing people when they do wrong. I like it no more than they do; I am often very, very sorry for them, poor things: but I cannot help it. If I tried not to do it, I should do it all the same. For I work by machinery, just like an engine; and am full of wheels and springs inside; and am wound up very carefully, so that I cannot help going.’ (153)

She warns Tom that not knowing things are wrong is no reason not to be punished anyway; for example, “if you don’t know that fire burns, that is no reason that it should not burn you; and if you don’t know that dirt breeds fever, that is no reason why the fevers should not kill you” (152). Reminiscent of Spencer’s educational philosophy, the law of nature for Kingsley plays no favorites.

Her sister, Mrs. Doasyouwouldbedoneby, on the other hand, is “the most nice, soft, fat, smooth, pussy, cuddly, delicious creature who ever nursed a baby” (157). She represents divine love in her nurturing of the water-babies. Interestingly enough, the two fairies never appear in the same scene together, the reason for which is glossed

over until the end of the novel when Kingsley reveals all three fairies are different aspects of the same entity.

The third figure in Kingsley's female pantheon is Mother Carey. After many years of lessons on St. Brandan's Isle, Tom is finally sent on his own journey to go somewhere he "doesn't like to go" and to "help someone he doesn't like" (167), in this case his former master, Mr. Grimes, who is being punished with a purgatory-like existence at the Other-End-of-Nowhere. To help complete this task, Tom must seek Mother Carey, whom he eventually finds at Shiny Wall in the Arctic sitting on a marble throne at the middle of Peacepool:

> And from the foot of the throne there swum away, out and into the sea, millions of new-born creatures, of more shapes and colours than man ever dreamed. And they were Mother Carey's children, who she makes out of the sea-water all day long.
>
> He expected, of course — like some grown people who ought to know better — to find her snipping, piecing, fitting, stitching, cobbling, basting, filing, planning, hammering, turning, polishing, moulding, measuring, chiseling, clipping, and so forth as men do when they go to work to make anything.
>
> But instead of that, she sat quite still with her chin upon her hand, looking down into the sea with two great grand blue eyes, as blue as the sea itself. Her hair was as white as the snow — for she was very old — in fact as old as anything which you are likely to come across, except the difference between right and wrong. (195)

Mother Carey is the creative force at work in Kingsley's fictional world, making creatures make themselves. Kingsley has merged Darwin's idea of natural selection with a concept that he had first proposed in 1855 in Glaucus; or, The Wonders of the Shore:

> Ought God to appear less or more august in our eyes if we discover that the means [of creation] are even simpler than we supposed? We held Him to be Almighty and All-wise. Are we to reverence Him less or more if we find Him to be so much mightier, so much wiser, than we dreamed, that He can not only make things, but—the very perfection of creative power—MAKE ALL THINGS MAKE THEMSELVES? (55)

The creative power that Mother Carey possesses allows species to follow a natural course of evolution. She is the paradox of an absent presence; God's workings are so fused with nature as to be invisible. Providential evolution thus is at work here. First, God does not create all at once, or once and for all. God creates through a process that meanders over vast stretches of time: that is, by evolution. And, second, rather than creating directly by divine fiat, God creates through persuasion -- by evoking the creativity of all the many centers of power throughout the universe. God does not make us; rather, God makes it possible that we make ourselves.

In essence, what Kingsley has created with these three females is a new kind of trinity. They are each aspects of

nature, and we discover at the end of the novel that they are truly one. At the end of his journey, Tom is reunited with Ellie, and both are surprised to discover that they are now a young man and woman. The fairy asks them to look at her once more:

> They looked--and both of them cried out at once, 'Oh, who are you, after all?'
>
> 'You are our dear Mrs. Doasyouwouldbedoneby.'
>
> 'No, you are good Mrs. Bedonebyasyoudid; but you are grown quite beautiful now!'
>
> 'To you,' said the fairy. 'But look again.'
>
> 'You are Mother Carey,' said Tom, in a very low, solemn voice; for he had found out something which made him very happy, and yet frightened him more than all that he had ever seen.
>
> 'But you are grown quite young again.'
>
> 'To you,' said the fairy. 'Look again.'
>
> 'You are the Irishwoman who met me the day I went to Harthover!'
>
> And when they looked she was neither of them, and yet all of them at once.
>
> 'My name is written in my eyes, if you have eyes to see it there.'
>
> And they looked into her great, deep, soft eyes, and they changed again and again into every hue, as the light changes in a diamond.
>
> 'Now read my name," said she, at last.
>
> And her eyes flashed, for one moment, clear, white, blazing light: but the children could not read her name; for they were dazzled, and hid their faces in their hands.
>
> 'Not yet, young things, not yet,' said she, smiling; and then she turned to Ellie. (229)

Tom and Ellie, as far as they have come, are still not capable of seeing the fairy's true self. Their moral development as humans is limited, and given this

limitation, they are incapable of seeing and understanding the divine.

To convince Tom that he must do that which he does not wish to do, Mrs. Bedonebyasyoudid shows him and Ellie a picturebook about the history of the Doasyoulikes. Kingsley demonstrates the concept of degeneration believed to be inherent in the natural selection process. Each page the fairy turns moves the story ahead 500 years, illustrating natural selection in action. The Doasyoulikes, originally from the land of Hardwork, move into the Land of Readymade where there is no need for work, and they quickly become a comfortable and lazy people. Living at the foot of the Happygolucky Mountains, rather than building homes, they prefer to sit “under the flapdoodle-trees, and let flapdoodle drop into their mouths. . .and if any little pigs ran about ready roasted, crying ‘Come and eat me,’ as was their fashion in that country, they waited till the pigs ran against their mouths, and then took a bite, and were content” (172). Everything was readymade to their hand and “the stern old fairy Necessity never came near them to hunt them up, and make them use their wits or die” (172). Without competition and struggle, the Doasyoulikes grow more and more lazy, both physically and mentally, and eventually begin to forget how to speak and think. At one

point near the end of the story, Mrs. Bedonebyasyoudid warns that “they will be apes very soon, and all by doing only what they liked” (175). When a nearby volcano erupts and turns their paradise to ashes, they are unable to cope. They finally become tree-dwelling apes and are eliminated by a combination of poor diet, wild animals, and hunters. The fairy concludes with one last warning:

> ‘Folks say now that I can make beasts into men, by circumstance, and selection, and competition, and so forth. Well, perhaps they are right; and perhaps, again, they are wrong. That is one of the seven things which I am forbidden to tell, till the coming of the Cocqcigrues; and, at all events, it is no concern of theirs. Whatever their ancestors, were, men they are; and I advise them to behave as such, and act accordingly. But let them recollect this, that there are two sides to every questions, and a downhill as well as an uphill road; and, if I can turn beasts into men, I can, by the same laws of circumstance, and selection, and competition, turn men into beasts.’ (175-76)

She echoes Kingsley’s descriptions of Tom as an ape early in the story at Harthover, an existence that might have continued if not for the intervention of the Queen of the Fairies. With degradation not only a biological possibility but also a moral danger, this cautionary tale has direct applications to Tom’s situation. He must go on a journey in which he will do that which he dislikes. At first he resists this idea, but with the tale of the Doasyoulikes, he realizes he must face this challenge, for the water-

babies who do not take this final journey become efts, left behind in the slime, unable to evolve.

In addition to the key scientific concepts of his day, Kingsley also uses his fantasy to comment on the philosophical outlook that many scientists often expressed. He takes a moderate position with science and religion, believing that scientists who try to explain away the existence of the spirit would be as intellectually stunted as clerics who attempt to dismiss the truths of science. To illustrate his point, Kingsley aims part of his satire in the novel not at the scientist in general, but rather specifically at those scientific materialists who leave no room for spiritual meanings and will not accept the boundaries of their knowledge. The limits of such a rigid, narrow-minded scientific worldview is best seen in the character of Professor Ptthmllnsprts (Put-them-all-in-spirits), who claims that nothing is true except for what he has directly experienced through his senses. As a professor of Necrobioneoalenthydrochthonanthropoithekology, Ptthmllnsprts is a knowledgeable gentleman and scholar but a stubborn egoist, organizing the world around himself and refusing either to recognize the limits of science or to alter his views once set. In fact, he will not admit the evidence of his own eyes when confronted. Coincidentally,

he is a tutor to little Ellie, the same little girl who had awed Tom at the beginning of the story with her cleanliness and neatness.

One day at the seaside, Ellie stubbornly questions the professor as to why there are not any such marvelous things as water-babies. She declares that she has seen water-babies "in a picture at home, of a beautiful lady sailing in a car drawn by dolphins, and babies flying round her, and one sitting in her lap" and claims that "it is so beautiful, that it must be true" (122). Siding with the girl's aesthetic views, the narrator interjects, "Ah, you dear little Ellie, fresh out of heaven! when will people understand that one of the deepest and wisest speeches which can come out of a human mouth is that -- 'It is so beautiful that it must be true?'" (123). The professor, speaking for scientific fact, impatiently responds, "forgetting that he was a scientific man, and therefore ought to have known that he couldn't know; and that he was a logician, and therefore ought to have known that he could not prove an universal negative," by simply repeating his answer -- "'Because there ain't'" (126), a response that the narrator admits "was not even very good English" (126).

At that precise moment, though, the professor happens to capture little Tom in his net. Tom luckily soon escapes

but not before the professor witnesses his existence. Unfortunately, the professor is of the school of thought that “you must show your respect for children, by never confessing yourself in the wrong to them, even if you know that you are so, lest they should lose confidence in their elders” (127). Despite such irrefutable evidence, the professor remains true to his original hypothesis -- there are no such things as water-babies. The name of the Professor’s discipline “necrobio” even indicates his interest in dead life rather than new life or even life as it currently is. When Tom escapes back to the water and to his fantasy world, the professor is not upset since a water-baby has no place in his view of the world anyway. Kingsley the storyteller adds, “And this is why they say that no one has ever yet seen a water-baby. For my part, I believe that the naturalists get dozens of them when they are out dredging: but they say nothing about them, and throw them overboard again, for fear of spoiling their theories” (129). Kingsley, the writer and clergyman, has designed his story as a “parable critical of the emergent scientific worldview that was incomplete and unnecessarily rigid” (Paradis 162). In this sense, Kingsley’s purpose aligns with that of Gatty’s. The materialism of scientific naturalism dismayed both writers because it ignored the

spiritual side to nature. An underlying purpose of The Water-Babies is to teach that, unenlightened by the truth of Christianity, the scientific mode offers an inadequate approach to the analysis of nature. Paradis notes that Kingsley portrayed the "scientific naturalist as the rigid, doctrinaire authority, bent on reducing human experience to the terms of his naturalistic vocabulary" (162). The professor's analysis of life misrepresents creation because it declares the nonexistence of water-babies solely on the grounds that nobody has ever seen one.

Sadly, Ellie re-enters the story later as part water-baby, part angel.[7] In her outing with Professor Ptthmlnsprts, she unfortunately fell from the rocks and died. She becomes Tom's moral guide. Under her influence, Tom gradually reforms and wishes to accompany her when she leaves on Sundays to go home "to a very beautiful place" (166). Mrs. Bedonebyasyoudid informs him, however, that "Those who go there must go first where they do not like, and do what they do not like, and help somebody they do not like" (167). Kingsley has shifted Darwin's idea of natural selection from the physical world to the moral, showing the state of one's physical existence to be dependent on the state of one's soul, and endowed the evolutionary process with a redemptive end. For Kingsley, evolution has a

redemptive purpose as we strive to better ourselves morally. Exercising moral choice, we undergo spiritual growth.

Realizing that seeking out Mr. Grimes is now his moral duty, Tom finally agrees to begin the journey. His first stop is PeacePool where he finds Mother Carey who will direct him on to the next stage of his journey, the Other-End-of-Nowhere; only, to reach his destination, Tom "must go the whole way backward" (197). She illustrates her reasoning behind such unusual instructions by recounting the story of Prometheus and Epimetheus. In Greek mythology, Prometheus was the admired and noble symbol of man's resistance to the tyranny of the gods, whereas his brother, Epimetheus, was the slow-witted one who released all the ills of the world from Pandora's box. In Mother Carey's version, Prometheus is indeed forward-looking while his brother is slow and always looking behind him. By looking at what had already happened, however, Epimetheus was able to understand how the world functioned and able to make things that worked. Surprisingly, as Mother Carey concludes, Epimetheus's "children are the men of science, who get good lasting work done in the world: but the children of Prometheus are the fanatics, and the theorists, and the bigots, and the bores, and the noisy windy people,

who go telling silly folk what will happen, instead of looking to see what has happened already" (199). In Mother Carey's version of the myth, Epimetheus is the true benefactor of mankind, for he proceeds experimentally "by always looking behind him to see what had happened" (199).

It is appropriate that T.H. Huxley was faced with the question from his grandson Julian about the existence of water-babies. Many children had wondered the same question ever since the novel was published. In response to one of the narrator's many commentaries in the novel, the implied child listener declares that "there are no such things as water-babies" (77). The narrator responds, "How do you know that? Have you been there to see? And if you had been there to see, and had seen none, that would not prove that there are none." The child continues to argue, however, saying that if water-babies existed, one would have long since been caught, examined, classified, and most likely stuffed. The narrator's point is that no absolutes can exist in man's understanding of nature. Kingsley blurs the distinction between empirical knowledge and imaginative fantasy:

> but the wiser men are, the less they talk about 'cannot.' That is a very rash, dangerous word, that 'cannot'; and if people use it too often, the Queen of all the Fairies, who makes the clouds thunder and the fleas bite, and takes just

> as much trouble about one as about the other, is apt to astonish the suddenly by showing them, that though they say she cannot, yet she can, and what is more, will, whether they approve or not. (79)

Frequently in the novel, the narrator critiques the idea of humankind having absolute authority. “You must not say that this cannot be” -- science must not trample on imagination or faith. Purely scientific explanations of reality would benefit by being placed in the larger context of Christian revelation. The narrator continues by stressing that one cannot deny the existence of such wondrous things as water-babies:

> 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. (78-79)

Even accepted and respected authorities such as Owen, Huxley, Darwin, and other leading scientists can be questioned. In fact, natural events occur all around us that we all accept even if we cannot immediately explain them:

> And therefore it is, that there are dozens and hundreds of things in the world which we should certainly have said were contrary to nature, if we did not see them going on under our eyes all day long. If people had never seen little seeds grow into great plants and trees, of quite different shape from themselves, and these trees again produce fresh seeds, to grow into fresh trees, they would have said, 'The thing cannot be; it is contrary to nature.' And they would have been quite as right in saying so, as in saying that most other things cannot be. (79)

This argument from analogy is typical of Kingsley's style and indicative of his popularization techniques used in other natural history works such as Glaucus (1855) and Madam How and Lady Why (1869). An effective, instructional technique, analogy helps readers understand complex concepts by relating them to everyday events or objects. Gillian Beer describes analogy as possessing an inherent sense of story in which "complete resolution is the sought-for-end -- albeit an end which can rarely, if ever, be reached" (74). Using analogy, Kingsley guides his readers to new truths by revealing the order and meaning implicit in the underlying similarities.

The third section of the novel, where Kingsley connects his fantasy to his own social and political world, is the most allegorical in style and in structure. As Tom nears the Other-End-of-Nowhere, he visits such locales as Waste-paper-land, the Land of Hearsay, Oldwivesfabledom,

and the Isle of Tomtoddies. In the latter place, for instance, Tom encounters children who have inadequate moral guides and will therefore never advance. A sad example is the child whose parents have turned its brain into a turnip through over-learning. It cannot move because its limbs have not been exercised. Parents and teachers have kept the children constantly preparing for examinations,

> always at lessons, working, working, working, learning weekday lesson all weekdays, and Sunday lessons all Sunday, and weekly examinations every Saturday, and monthly examinations every month, and yearly examinations every year, everything seven times over. (215)

Using the poor turnip children, Kingsley satirizes the overemphasis placed on examinations in the educational system. The allegorical fantasy humorously exaggerates his points and allows Kingsley to comment freely on a number of topical issues of his time without causing offense.

Kingsley summarizes his purpose in The Water-Babies in a letter to his friend Frederick Maurice. He explains that "if I have wrapped up my parable in seeming Tomfooleries, it is because so only could I get the pill swallowed by a generation who are not believing with anything like their whole heart, in the living God" (Letters 137). Unlike Gatty's traditional interpretations of natural theology in her parables, Kingsley's ideas of providential evolution

and of the soul creating the body were progressive, thought-provoking, and controversial. For those reasons, he chose the fairy tale genre as an effective method of sustaining both his child readers' interest and his adult readers' sympathies to his ideas. Even unorthodox ideas, if sugarcoated, can seem innocuous. According to Stephen Prickett, though, delve too deeply into the logic of the fantasy and "dissolve the sugar, and something very odd indeed has happened to the pill -- it is hardly there at all" (153). Prickett reminds us that the nonsense, digressions, Rabelaisan lists, allegorical riddles, and narrative inconsistencies are as much a part of Kingsley's creation as his religious and scientific themes.

In the next chapter, I look at Arabella Buckley who also wraps her scientific ideas in a fairy tale guise to illustrate the magic and wonder inherent in the natural world. Writing later than Kingsley, she, too, finds that fantasy can stimulate interest and attract child readers to new ideas in an increasingly complex modern world.

Notes

[1] In Chronic Vigour, Gregory Elder provides a concise overview of the various theological responses that came forth to Darwin's ideas: religious skepticism, Biblicism, liberalism, imprecision, and sympathy. The religious skeptics were led in their stance by Darwin's friend, Thomas Henry Huxley who coined the word agnosticism for their particular position of separation from the orthodox Christianity. At the opposite extreme were the Biblicists, who retreated into scriptural religious authority, asserting the historical accuracy and the unique authority of sacred scriptures. Other, more liberal thinkers placed a high value on intellect in the study of theology and less value on scripture and tradition; while this group debated on intellectual grounds, they still resisted the destruction of the argument from design. Imprecision was another strategy some Church members used; retreating into a calculated religious vagueness, these took a "wait and see" attitude regarding how science and the Bible work things out. Finally, there were those with some degree of intellectual sympathy for evolution.

[2] In the mid-seventeenth century, Archbishop James Ussher had worked out the date of Creation to be October 23, 4004 B.C., by adding together all the life-spans of all the patriarchs listed in the Old Testament genealogy. The date was frequently printed in the margins of Bibles, granting it scriptural authority.

[3] In 1884, Bishop Frederick Temple (then Bishop of London and later Archbishop of Canterbury) openly acknowledged the soundness of the theory of evolution and mutation of biological species (Elder 2). In his Eight Brampton Lectures on the Relations between Religion and Science (1884) he states clearly that "doctrine of Evolution is in no sense whatever antagonistic to the teachings of Religion." These lectures also addressed the origin and nature of scientific, and of religious belief and the apparent conflicts between Science and Religion on free will and supernatural power.

[4] "Omphalos" is Greek for navel. The book was a financial and intellectual failure for Gosse, for which his reputation suffered greatly.

[5] In 1864, a year after the book publication of The Water-Babies, the Chimney Sweepers Regulation Act was passed. While it was likely that the Act would have passed anyway, Kingsley's novel is usually credited with raising public awareness.

[6] With the 1870 Forster Act, which made school attendance compulsory for British children from five to twelve years of age, Spencer's ideas of learning through nature and science became especially popular. By the 1880s, summaries of Education appeared in teacher training manuals.

[7] Ellie's exact status is purposely vague. She is not a true water-baby since she only comes to St. Brandan's Isle to help instruct Tom and then leaves to go "home" each Sunday. This home, most likely heaven but never identified, makes Tom curious and envious, helping to motivate him to be good so he can one day accompany her.

Chapter 4

Arabella Buckley:

The Fairy "Life" and Spiritual Evolutionism

> There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved. Darwin, On the Origin of Species (1st edition, 1859)

In December 1879, Charles Darwin received a letter from Arabella Buckley, the former private secretary to his friend Sir Charles Lyell, asking for his assistance: "I want very much to consult you upon a matter in which I have perhaps no real concern, but with which I believe I am better acquainted than others" (qtd. in Colp 8). Buckley was hoping that Darwin could help find a pension for Alfred Russell Wallace, the co-originator of the principle of natural selection in evolution. She was a friend of both Wallace and Darwin, though she was now writing the latter without Wallace's knowledge: "I know that pecuniarily it was of importance to him [Wallace] to get a regular salary; He is not strong & literary work tires him very much & the uncertainty of it is a great anxiety to him" (qtd. in Colp 8). Yet convincing others of Wallace's worthiness was not

easy. By this time in his life, Wallace had become greatly interested in spiritualism, advocating scientific investigations of such phenomena. This interest dismayed Darwin and other scientific friends, even causing Joseph Hooker, the botanist, to initially decline his support for the pension because "Wallace has lost caste terribly" (qtd. in Shermer 274). When Darwin responded to Buckley initially that a pension probably would not be forthcoming, Buckley replied, "I have always feared that Mr. Wallace's want of worldly caution might injure him, though he would be the most valuable man in the right place" (qtd. in Colp 11). Fortunately, Darwin was later able to gather support from other scientists such as T.H. Huxley and John Lubbock.

In the meantime, Darwin's and Buckley's correspondence continued, with Buckley even assisting Darwin with the case for the pension by compiling a list of accomplishments and writings for Wallace. In 1881, Wallace was finally awarded a civil pension of 200 pounds a year for life, "directly approved by Prime Minister Gladstone and justified by Wallace's scientific and geographic exploratory contributions to the British Empire" (Shermer 273). Buckley, upon receiving the news from Darwin, gratefully wrote, "I have always thought that your generous friendship for Mr. Wallace, & the almost overdue credit which you have

always assigned to him, is one of those bright spots in the history of science, which ought to shame all those who indulge in petty jealousies; & this success is the befitting crown to the whole matter" (qtd. in Colp 23). Buckley knowingly points out how rare it was in scientific circles for a major scientist, such as Darwin, to share credit with a relatively lesser known one, such as Wallace.

I have chosen to relate this account of Wallace's situation not because of the focus on Wallace but because of what it reveals about Buckley's character and about her relationships with established Victorian scientists. Through her position as Lyell's secretary, Buckley had become personally familiar with several of the other leading scientists of her day, including Darwin, Wallace, and T.H. Huxley. Her position and familiarity gained her access to these men whereas her intelligence commanded their respect. Her on-the-job-training with Lyell -- taking dictation, handling his correspondence, proofreading his articles -- and her interaction with the other scientists honed her ability to understand complex scientific theories, which in turn, she was able later to popularize in her own natural history and science works in the late Victorian period. Although never a field naturalist, like Margaret Gatty or Isabella Gifford, Buckley still wished to

communicate the love of science that she had gained through her association with these scientists.

In this chapter, I first provide a glimpse into Buckley's life and intellectual interests, including spiritualism, as seen indirectly through her relations with prominent scientific figures. I then proceed to discuss her children's natural history texts, focusing primarily on Buckley's stylistic use of fantasy. Unlike Gatty and Kingsley, Buckley draws on fantasy as a rhetorical mode rather than a genre, firmly rooting her narrative in scientific facts to show that the wonders of science and nature were as intriguing and entertaining as any fictional tale.

The Lady and the Scientists

Arabella Buckley, in her own unassuming way, became a popular late Victorian writer of science. Her works for children revealed the magic of science without diluting the factual material. Surprisingly, for such a recognized writer, few details of Buckley's life are known. She was born on 24 October 1840 in Brighton, the daughter of Rev. John Wall Buckley, vicar of St. Mary's, Paddington Green, and his wife, Elizabeth. Most biographical sources then jump to 1864 when she became, at the age of 24, the

personal secretary to the geologist Sir Charles Lyell (1797-1875), assisting him until his death in 1875. After Lyell's death, Buckley began a career as a lecturer and popularizer of science, writing over ten books on science, most for children, between 1876 and 1901. On 6 March 1884 at age 44, she married Dr. Thomas Fisher, a widower from Christchurch, New Zealand, though she continued to write under her maiden name. She died of influenza at her home in Devon on 9 February 1929.

Despite the lack of biographical details, we can gain our clearest picture of Buckley through her relationships and her correspondence with the various scientists she encountered. Lyell, for example, provided a great deal of formative training to Buckley for the eleven years she served as his personal secretary. Lyell's sister-in-law, in his Life, Letters, and Journals, describes Buckley as "a lady gifted with a rare intellectual power. From her daily intercourse with one [Lyell] who never failed to inspire all those who were with him with a love of his science, she acquired an extensive acquaintance with the subject" (381). Buckley absorbed her love for and knowledge of science from her work with Lyell and his scientific colleagues.

Besides instilling in Buckley the general appreciation for science, Lyell's most direct influence on her as a

writer was his ability to “envision the scope of things, to imagine vast panoramas or deep cross-sections that sent his reader’s eye back through time or downward into the unseeable earth’s crust” (Gates, “Revisioning” 172). Lyell's major work Principles of Geology was published in three volumes in 1830—33, establishing his credentials as an important geological theorist and propounding the doctrine of uniformitarianism.[1] The work's subtitle was "an attempt to explain the former changes of the Earth's surface by reference to causes now in operation" or in other words, explaining how the present is the key to understanding the past. Geological formations from the distant past could be explained by reference to geological processes now in operation and thus directly observable. Lyell interprets geologic change as the steady accumulation of minute changes over enormously long spans of time, a point that would become a powerful influence on Buckley when she began to shape her own story of evolution.

Similarly, Lyell’s religious concerns about evolution may also have influenced Buckley. Although a good friend of Darwin’s, Lyell was a committed Unitarian and thus reluctant to accept evolution and natural selection even though his own work in geology had given Darwin some of the initial ideas for his theories. Even Lyell’s later work

Geological Evidences of the Antiquity of Man (1863), which was informed by his friend's Origin, was disappointingly equivocal in its treatment of human evolution. Lyell had accepted evolution and natural selection but only as a method of God's creation, similar to Kingsley's providential evolution, and he could never accept human evolution.

Buckley's first work for young readers, A Short History of Natural Science and of the Progress of Discovery, from the Time of the Greeks to the Present Day (1876) appeared about a year after his death. The book's dedication reveals the gratitude Buckley felt toward Lyell in teaching her so much about science:

> To the memory of my beloved and revered friends, Sir Charles and Lady Lyell, to whom I owe more than I can ever express, I dedicate this my first book trusting that it may help to develop [sic] in those who read it that earnest and truth-seeking spirit in the study of God's works and laws which was the guiding principle of their lives.

Buckley recalls in the preface that she often "felt very forcibly how many important facts and generalizations of science, which are of great value in the formation of character and in giving a true estimate of life and its conditions, are totally unknown to the majority of otherwise well-educated persons" (vii-viii). To supply

"that modest amount of scientific information which everyone ought to possess" and forming "a useful groundwork for those who wish afterwards to study any special branch of science" (viii), the book surveys the history of science from antiquity through the nineteenth century. Buckley's history also contains accounts of how Darwin and Wallace had each separately discovered natural selection, though it characterizes Darwin as the chief discoverer. Darwin wrote to Buckley soon after the book's publication, praising that the concept behind the survey was "a capital one, and as far as I can judge very well carried out. There is much fascination in taking a bird's eye view of all the grand leading steps in the progress of science" (qtd. in F. Darwin 405).

Lyell's friendship with Darwin was another influence on Buckley. His Principles of Geology, along with Thomas Malthus's Essay on the Principle of Population (1798) and William Paley's Natural Theology (1802), had been "among the leading models of theoretical speculation that influenced Darwin's own thinking about natural history from the 1830s onward" (Dixon 153). From the 1850s onward, Lyell and Darwin became close friends, and from 1864-1875 Buckley would have handled the extensive correspondence between the two men, particularly due to Lyell's progressively failing

eyesight. As we have already seen, Buckley had such a level of familiarity with Darwin that she felt comfortable imposing on him in regards to Wallace's pension. Buckley was a regular visitor to Darwin's home, first to handle matters for Lyell and later for her own interest in science and in Darwin's work. According to Darwin's son Francis, "Miss Buckley was one of the few women who could be regarded as his [Darwin's] friend – though there were many women whose society he enjoyed very much" (qtd. in Lightman, Victorian Popularizers 241). In a 1926 letter to the editor of the journal Science, Buckley recalls,

> I am now an old woman 86 years of age, but I was a young girl of 23 when, as secretary to Sir Chas. Lyell, I first met Mr. Darwin and was encouraged by him to write on animal life for children. I had the privilege of visiting him and Mrs. Darwin at Down until his death in 1882. I revered him not only for his work but for his noble character, and was somewhat pained by the reaction against natural selection in the struggle for existence exhibited by some English and American zoologists after his death. (623)

Even at the end of her life, her memories of Darwin were filled with fondness and respect, and her appreciation of his ideas about natural selection unwavering.

Whereas Buckley respected Darwin for his character and ideas, she had a more divided view of the man known as "Darwin's Bulldog," T.H. Huxley. She respected his scientific intellect but disagreed with his agnostic

beliefs. As an aspiring lecturer herself, she admired Huxley's ability in his own lectures and essays to go beyond the dry facts and bring his subject to life for a general audience. Bernard Lightman recounts an instance, however, where Buckley was upset over Huxley's beliefs. After attending Huxley's Royal Institution lecture on the "Metaphysics of Sensation," she wrote to him about his views, apologizing if she had seemed rude in her questioning at the lecture: "My remark that 'I could not believe it' was not quite so impertinent as it must have appeared and it would be a great satisfaction to me to know whether I can have misunderstood you" (qtd. in Victorian Popularizers 240). Huxley had evidently implied at the conclusion of the lecture that it was improper to even form a conception of God, an implication which "pained" her. In the past she had not felt bothered by Huxley's beliefs, although contrary to her own, for he had not denied "us a power of conception of God if only we will allow that it is imperfect and not talk of Him as if he were a 'man in the next street' about whose actions we were perfect judges" (240). Now that Huxley was more publicly adamant about his agnostic beliefs, Buckley found less common ground with him in scientific discussions.

The scientist of Lyell's circle, however, with whom Buckley had "formed the deepest intellectual bond" upon meeting him in 1863 was Alfred Russel Wallace (242). Wallace had been a field naturalist, first in the Amazon River basin of South America and then in the Malay Archipelago where he had conducted extensive research on the geographical distribution of animal species.[2] His field studies had led him to propose independently a theory of natural selection, a proposal credited with prompting Darwin to publish his own theory.

According to Wallace, at various receptions held by the Lyells, Buckley had befriended the socially awkward Wallace and pointed out to him "the various celebrities who happened to be present, and thus began a cordial friendship which has continued unbroken, and has been a mutual pleasure and advantage" (243).

Although indebted to Darwin and his ideas about natural selection, Buckley looked particularly to Wallace to understand the spiritual dimensions of evolution. After the initial publication of Darwin's Origin of Species, Wallace began experiencing some doubt as to whether materialistic models, including Darwinism, could account for humankind's higher mental and moral qualities. Already fascinated by phrenology and mesmerism, he now began

investigating the philosophy and manifestations of spiritualism.[3] Spiritualism appealed to many educated Victorians who no longer found traditional religious doctrine, such as that of the Church of England, acceptable. They were unsatisfied with the materialistic and mechanical view of the world that was increasingly emerging from nineteenth-century science.

Victorian interest in spiritualism was an American import, tracing its roots back to 1848 with the New York sisters Kate and Margaret Fox. The Fox sisters conducted séances and supposedly communicated with spirits vis-a-vis a system of rappings.[4] Through the human agent known as the "medium," the spirits communicated through tappings, materializations of spirit forms, levitations of persons or objects, or mysterious lights that had no apparent source.

As with Victorian religion and society at large, spiritualism sought to successfully integrate traditional spiritual beliefs with the new tenets and methods of science. While “table turning” and ectoplasmic materializations were often dismissed as charades or seen as mere entertaining spectacles, the broader implications of spiritualism are what concerned people such as Wallace and Buckley. Science, in all its manifestations, was broadcasting a materialistic philosophy, and spiritualists

opposed “that tendency of modern thought [materialism] with a bold affirmation of spiritualism, the assertion that spirit exists and functions in the universe as surely as matter” (Oppenheim 2). For them, spirits are capable of growth and perfection, progressing through higher spheres or planes. The afterlife is not a static place, but one in which spirits evolve as life has on the earthly plane.

Wallace no longer saw natural selection as the agent of human progress. The physical form of humans, as with that of all other life, could be explained by natural selection and evolution. The emergence of human intelligence and moral qualities, however, could only be explained by the directive action of an unseen power. The result was a wholly new evolutionary synthesis, one in which a material process, natural selection, was understood to rule at the biological level, while a spiritual one operated at the level of consciousness. Wallace believed that something in "the unseen universe of Spirit" had intervened in creation at least three times in history (Kottler 162). The first instance was the creation of life from inorganic matter; the second was the introduction of consciousness in the higher animals; and the third was the generation of the higher mental faculties in mankind.

Wallace also believed that the purpose of the universe was the development of the human spirit.

This new evolutionary synthesis directly goes against Darwin whose view of evolution was neither teleological nor anthropocentric. Still, according to his early biographer, James Marchant, Wallace had come to realize

> that, indeed, there were two lines of development -- one affecting the visible world of form and colour and the other the invisible world of life and spirit. . . .It was, in short, his peculiar task to reveal something of the Why as well as the How of the evolutionary process, and in doing so verily to bring immortality to light. (415)

Because of their close friendship, Wallace's spiritual beliefs directly impacted Buckley. In 1870, Wallace invited Buckley to a lecture by a leading spiritualist, Emma Hardinge Britten. He wanted to show Buckley that some spiritualists did have "a true scientific understanding" (Slotten 305) and to caution her not to judge spiritualism on spectacles such as public séances. In 1874, they began to correspond on experiences with mediums and spiritualism. Upon the death of Wallace's eldest child, Herbert, Buckley wrote Wallace commenting, "How wonderful it is how completely [emphasis Buckley's] Spiritualism alters one's idea of death, but I think it increases one's wish to know what they are doing" (qtd. in Lightman, Victorian Popularizers 243). As for her own attempts at being a

medium -- she felt she may have received a message from Herbert -- in a subsequent letter to Wallace, she explained that both of her tests had failed to confirm their authenticity and so she had begun to believe she didn't have the potential to be a medium after all (243).

Buckley also once visited a medium to deal with a serious case of writer's block. On Buckley's third visit, the medium mesmerized her and she went into a trance. After each visit, "writing has been easier, and yesterday I wrote five large pages of perfectly coherent writing in less than twenty minutes" (243). While skeptics might accuse her of hysteria or mania, and while she could not fully explain the experience herself, she was glad that her reason had shown her "that I am not excited mentally in the least and can reason upon it as if it were someone else while at the same time being the agent I am able to convince myself that there is no deception" (243).

Buckley's introduction to spiritualism helped to shape her own philosophy about its role within evolution. In January 1879, she wrote an anonymous[5] essay for The University Magazine titled "The Soul, and the Theory of Evolution." For Buckley, as for Wallace, materialism alone could not possibly account for human consciousness. The spiritualist, Buckley argues, looks upon consciousness "as

the result of a power quite as real and manifest as the forces which underlie matter" (2) and "as being received from the First Cause of all things by a different channel, and not through the properties of material substance" (2). The life-principle is a "power which has never localized itself in so-called material substance, but which permeates the organic form, in the same way as ether is supposed to pass between the grosser atoms of matter" (7). This life-principle is passed from generation to generation "from flower to seed, from animals to their offspring, from parent to child" and that during each lifetime it draws in fresh supplies from the general fund of spirit (7).

As we can see, Buckley's views of science in general, and of evolution in particular, were directly influenced by her intimate association with leading scientists of her day. Unlike Gatty, Buckley learned of the newest discoveries and theories firsthand. Her education about science solidified gradually as she immersed herself in her day-to-day duties as Lyell's secretary, so that by the time of his death in 1875, Buckley was ready to transition to her new role as science popularizer. In the next section of the chapter, I examine three of Buckley's popularizations for children -- The Fairy-Land of Science (1879), Life and Her Children (1880), and Winners in Life's Race (1882).

Echoes of Lyell, Wallace, and Darwin appear throughout these works. I also argue that the stylistic use of fantasy in these nonfiction works reflects not only Buckley's narrative artistry in re-presenting scientific concepts to young readers but also her beliefs in a spiritual realm beyond the material one. Her moderate spiritualism inspires her faith in science's ability to make visible the unseen world.

The Fairy Realm of Science

Lynn Merrill in The Romance of Victorian Natural History argues that "natural history displays some very unscientific qualities that draw it closer to literature: emotion, evocativeness, and connotation" (17). In previous chapters, we have seen how Margaret Gatty and Charles Kingsley chose fiction as their primary vehicle for discussing natural history. Aside from her British Seaweeds, which was a descriptive reference work for amateur seaweed collectors, Gatty's primary approach to popularization was through the fictional parable, whose purpose was conveyed in the combination of scientific detail and moral message. Likewise, Kingsley also chose fiction as his genre to promote providential evolution couched in fairy tale tropes. These traditional narrative

forms co-opted natural history as part of their message. Buckley, however, is a different kind of science popularizer than either Gatty or Kingsley, having chosen narrative nonfiction as her approach to popularizing science. Using a subjective narrative style to convey objective scientific details, Buckley is the epitome of what Merrill describes. She begins with science, from which she evokes the inherent narrativity of her subject matter to illustrate the interrelatedness of ideas and to engage her readers' interest.

The narrative potential within science is apparent by examining the titles of many late Victorian science popularizations. Almost every aspect of science and nature has a story to tell: The Story of Eclipses (1899), The Story of the Solar System (c. 1895), and The Story of the Stars by G.F. Chambers; The Story of Wild Flowers by G. Henslow; The Story of a Piece of Coal (1896) by E.A. Martin; The Story of Bird Life (1900) by W.P. Pycraft; The Story of the Wanderings of Atoms (1899) by M.M. Pattison Muir; The Story of the Heavens (1885) by Robert Ball; and The Story of the Plants (1895) by Grant Allen.

Buckley's nonfiction work may at first resemble a school textbook, but in creating a story of science, she uses some of the same fictional approaches that Kingsley

does -- fairy tale tropes, for example -- to tap into the child's imagination and foster interest in the natural world. In contrast to Gatty, Buckley also minimizes direct references to her own religious faith as she uses the rhetoric of fairy tales to demonstrate that accurate science writing can be as gripping and artistic as good fiction.

One of Buckley's most successful works of narrative nonfiction was a series of ten lectures she had originally given to London children, which she published in 1879 as an elementary natural history text titled The Fairyland of Science. Whereas the narrative does not convey a conventional plot, Buckley, the narrator, introduces her readers in each lecture to various vignettes that illustrate the magical potential of this new fairyland. Representative lecture titles include "A Drop of Water on Its Travels," "The Two Great Sculptors — Water and Ice," and "The Voices of Nature and How We Hear Them."

In Lecture One, titled "How to Enter It; How to Use It; and How to Enjoy It," with "it" being science, Buckley first establishes the parallels between the fairy-land of folklore and the domain of science. Buckley begins,

> I have promised to introduce you today to the fairy-land of science — a somewhat bold promise, seeing that most of you probably look upon

> science as a bundle of dry facts, while fairy-land is all that is beautiful, and full of poetry and imagination. But I thoroughly believe myself, and hope to prove to you, that science is full of beautiful pictures, of real poetry, and of wonder-working fairies; and what is more, I promise you they shall be true fairies, whom you will love just as much when you are old and greyheaded as when you are young; for you will be able to call them up wherever you wander by land or by sea, through meadow or through wood, through water or through air; and though they themselves will always remain invisible, yet you will see their wonderful poet at work everywhere around you. (1)

She lays out her argument artfully, focusing on the charm and mystery that attract people to tales of fairyland and arguing that the same attraction is inherent in science. Buckley opposes the "dry facts" of a Dickensian Gradgrind or a Kingsleyan turnip child. Buckley wants her readers to understand true learning does not consist of rote memorization and regurgitation of facts.

Throughout her introductory lecture, Buckley prompts the reader with questions such as "Can science bring any tale to match this?" (2) and "Is not this a fairy tale of nature?" (3). To illustrate the similarities between fairyland and science, she introduces the invisible forces at work in the world:

> Now, exactly all this which is true of the fairies of our childhood is true too of the fairies of science. There are <u>forces</u> around us, and among us, which I shall ask you to allow me to call fairies, and these are ten thousand times

> more wonderful, more magical, and more beautiful in their work, than those of the old fairy tales. They, too, are invisible, and many people live and die without ever seeing them or caring to see them. These people go about with their eyes shut, either because they will not open them, or because no one has taught them how to see. (4)

In the passage above, Buckley astutely parallels fantasy with science to spark children's interest in natural history. These "fairies" that she mentions are a far cry from the traditional fantastical creatures of literature and folklore. Instead of Shakespeare's Titania or Cinderella's fairy godmother, these invisible powers are Cohesion, Gravitation, Crystallization, and Electricity — fairies of science, and the main characters of her narrative. Buckley "could count on her audience's curiosity, properly addressed, to make leaps from make-believe to science" (Gates, Kindred 53). She teaches her child readers that science is a way of understanding this unseen world.

Buckley next outlines what her readers need to enter the fairyland of science. First, we must have imagination, though Buckley cautions children studying science to distinguish between "mere fancy, which creates unreal images and impossible monsters, [and] imagination, the power of making pictures or images in our mind, of that which is, though it is invisible to us" (5). Thus, she

desires her readers to remain firmly rooted in the rational even when using their imaginations for understanding and appreciating the natural world. Children, in particular, possess this gift of imagination. She hopes “the day may never come when we may lose that childish clearness of vision, which enables us through the temporal things which are seen, to realize those eternal truths which are unseen” (5). Buckley then invites those who possess this gift to join her in the course of the book to search for “the invisible fairies of nature” (5).

Buckley continues with her metaphor of sight by declaring that we must open our eyes to the world around us. The fairy-land of science is not some exotic, far off, dream-like place; instead, “the fire in the grate, the lamp by the bedside, the water in the tumbler, the fly on the ceiling above, the flower in the vase on the table, anything, everything has its history, and can reveal to us nature’s invisible fairies” (8). The requirement, though, is that we must wish to see these fairies, and to question the workings of the world around us; then we “will learn to know and love those fairies” (9).

In encouraging readers to ask themselves “why things happen, and how the great God above us has made and governs this world of ours” (9), Buckley directly contrasts with

those natural history writers from the first half of the century who were content with mere descriptions of nature. Such writers as Jane Loudon and Jane Marcet had desired to communicate facts and descriptions about science and nature without directly questioning how or why the natural world operated the way it did. At mid-century, Gatty also describes the natural world, even commenting on issues that could be directly answered by natural theology, but she does not pursue any theoretical investigations. With Kingsley, we begin to see a change in focus. His narrator in The Water-Babies frequently adds philosophical observations and generally encourages his readers to keep an open-mind to new ideas. Likewise, Buckley considers questioning to be an important intellectual skill, though she does caution young readers not to always ask questions of others instead of working to find the answers for themselves: "for often a question quickly answered is quickly forgotten, but a difficulty really hunted down is a triumph for ever" (9).

One other necessity for entering the fairyland of science is that we "must learn the language of science" (9). Buckley does not suggest that technical jargon dominate a text but that a reader must really understand what is meant by the ordinary words used. As an example,

she offers the differences among the solid, liquid, and gaseous forms of matter, the definitions of which then lead to a discussion of chemical attraction. Learning the language of science is necessary in helping us "arrive at truth" and "get at the spirit which lies under the facts" (12). Along with language, the visual is also an important part of Buckley's approach to teaching science. While learning the facts, such as chemical formulas, may be important, "it is better still to have a mental picture of the tiny atoms clasping each other, and mingling so as to make a new substance, and to feel how wonderful are the many changing forms of nature" (12). Those who complain that science consists of only dull and dry facts fail to "clothe them with real meaning and love the truths they tell" (12).

At the end of the introductory lecture, Buckley mentions for the first time the role of a divine creator:

> We are all groping dimly for the Unseen Power, but no one who loves nature and studies it can ever feel alone or unloved in the world. Facts, as mere facts, are dry and barren, but nature is full of life and love, and her calm unswerving rule is tending to some great though hidden purpose. You may call this Unseen Power what you will — may lean on it in loving, trusting faith, or bend in reverent and silent awe; but even the little child who lives with nature and gazes on her with open eye, must rise in some sense or other through nature to nature's God. (15)

Less overtly Christian than Gatty, Buckley still draws on the tenets of natural theology in relating the wonders of nature with the wisdom and power of God. Gatty had devised moral stories to impart lessons learned from nature. Buckley, though also believing in nature as evidence of God's existence, was more concerned with teaching practical demonstrations of science. Aside from this initial mention and a final reference in the last lecture, however, Buckley maintains a secular, though, reverential, tone throughout The Fairy-Land of Science.

Whereas some chapters of Fairy-Land focus on broad realms of nature -- the air, the ocean, the sun -- Buckley also highlights the particular. Lecture VII, for example, is titled "The Life of a Primrose." She begins the lecture by returning to her fairy metaphor. The fairy behind the creation and growth of flowers is the fairy Life, "of whom we know so little, though we love her so well and rejoice in the beautiful forms she can produce" (80). Drawing on this character, the fairy Life, Buckley then fashions a simple sketch about the growth of seeds as she also proceeds to practical demonstrations. She has asked the reader to bring to this lesson a primrose flower, an almond soaked for a few minutes in hot water, and a piece of orange. The purpose of the almond is for the child reader

to examine the nature of seeds in general and then apply the resulting knowledge to the primrose:

> If you peel the two skins off your almond-seed (the thick, brown, outside skin, and the thin, transparent one under it), the two halves of the almond will slip apart quite easily. One of these halves will have a small dent at the pointed end, while in the other half you will see a little lump, which fitted into the dent when the two halves were joined. . . .If you look carefully, you will see two little points at this end, which are the tips of future leaves. (81)

Buckley then uses the piece of orange to illustrate the concept of plant cells by making the analogy to orange pulp containing "a number of long-shaped transparent bags, full of juice" (82). From there, Buckley easily proceeds to a discussion of sunlight and the growth process initiated by chlorophyll.

As we saw with Kingsley, analogy is a popular rhetorical approach to instruct readers about complex scientific ideas. Referring to Darwin's narrative structure, Gillian Beer in her seminal work Darwin's Plots (1984) argues that "analogy is predictive metaphor" (74). Analogy engages our curiosity and interest; as we expectantly follow the development of parallels, we simultaneously brace ourselves for possible divergence. If the parallels converge satisfactorily, however, the conditional becomes the actual. This speculative character

of analogy lends itself to scientific writing, for "when it is first advanced, theory is at its most fictive" (1).

While analogy helps Buckley instruct her readers, the participatory nature of science also adds to the effectiveness of the lectures in Fairyland. Clearly conscious of her audience, she invites them to engage directly in the study of science. Buckley's style echoes the conversational format of natural history writing from the 1820s. Just as Jane Marcet had wanted to create the illusion of a conversation between narrator and reader, Buckley's choice of pronouns helps draw her young readers into the text. She uses both the first person plural pronouns "we" and "us" to unite with the readers in their observation of nature together and the second person, directive "you" to create the illusion that the readers are in the lecture hall or the classroom with Buckley. As Barbara Gates observes, Buckley's rhetoric and genre "afforded her a greater degree of freedom from empirical self-consciousness than most scientific papers and scientific treatises might have allowed" (Kindred 57). Buckley's "you-are-there" approach emphasizes the process of her demonstrations whereas scientific papers would focus more on the results.

In addition to Fairy-Land, another of Buckley's best known works was her two-volume evolutionary epic, Life and Her Children: Glimpses of Animal Life from the Amoeba to the Insects (1880) and Winners in Life's Race; or, The Great Backboned Family (1880). The evolutionary epic was an important narrative format for science writing in the second half of the nineteenth century.[6] The term "evolutionary epic" was not used as such by Victorian writers, being coined much later to convey the grand scope of the evolutionary process. Such scientific works gained "epic status by moving through vast expanses of time, by ranging across a series of scientific disciplines, or even by presenting heroes who performed deeds of great valor" (Lightman, Victorian Popularizers 220). In a time when the rapid accumulation of knowledge in various scientific disciplines was having a dizzying impact on the general reader, the evolutionary epic provided a synthesis of knowledge that revealed connections among various branches of science.

The first evolutionary epic is usually cited as that of Robert Chambers, the anonymous author of the 1844 work Vestiges of the Natural History of Creation. James Secord argues that Vestiges' most important influence was to "provide a template for the evolutionary epic-book-length

works that covered all the sciences in a progressive synthesis" (461). Chambers does not just describe the evolution of life. He offers a cosmic theory of evolution, arguing that everything in existence, from the solar system to humankind, has developed from earlier forms. Although a bestseller, Vestiges had many critics among the clergy and scientists alike. The former group was outraged by the work's unorthodox ideas that rejected natural theology, while the latter group was disappointed in the numerous scientific errors. Still, Vestiges did help establish the panoramic format of storytelling on a cosmic time scale.

As a supporter of Darwinian evolution, Buckley wanted to produce a natural history that would incorporate many of the narrative strategies learned from Lyell and Darwin in order to do justice to the topic of evolution. While her narrative about evolution generally moves forward, recounting events and stages of development among various species, Buckley recognizes that evolution is not a simple sequential action, but a process of becoming in which deviation is the creative principle (Beer 58-59).

In Life and Her Children, Buckley's plan, as stated in the preface, is "to acquaint young people with the structure and habits of the lower forms of life; and to do this in a more systematic way than is usual in ordinary

works on Natural History and more simply than in text-books on Zoology" (v). Her stated purpose indicates that she strives for a middle ground between a generalized popularization and specialized scientific work, a difficult space to negotiate.

Buckley's purpose in the volume is to describe the struggle for existence and the adaptations of the simpler animals. She describes six divisions of invertebrates: microscopic slime animals; creatures with simple weapons of attack and defense, such as sponges and sea-anemones; prickly-skinned animals such as starfish; shell-inhabiting mollusks; worms; and jointed-foot animals such as crabs, centipedes, and spiders. Her approach is not exhaustive; instead, she wishes to illustrate "the general life and habits of the different branches of the still greater family of Life" (9). In her description of these "different branches" of animal life, Buckley continually points out each species' natural advantages to survive the struggle for existence in their particular niche in nature.

Carefully considering her young audience, Buckley begins the book with a practical illustration of competition as an impetus for progress. She asks, "If in a large school every boy had a prize at the end of the half-year, whether he had worked or not, do you think all the

boys would work as hard as they do or learn as well?" (5). She argues that the struggle for life and the necessity of work "makes people invent and plan, and improve themselves and things around them" (6). Progress depends upon work and competition.

Buckley next introduces "the main character" of her two volumes: Life, who "has to educate all her children, and she does it by giving the prize of success, health, strength, and enjoyment to those who can best fight the battle of existence, and do their work best in the world" (6). Buckley personifies Life -- "the invisible mother ever taking shape in her children" (4) -- in the title of the work itself and throughout the text. Buckley's unseen power, "Life," is reminiscent of Kingsley's Mother Carey, a supernatural power informing the evolutionary process. Like Mother Carey, Buckley's "invisible mother" imbues the animal kingdom with a life-force that spurs its evolution.

The introduction of "Life" compares interestingly with Darwin's use of the term "natural selection" in his Origin. As Beer suggests, the word "selection" itself implies a decision-maker, "an active, intentionalist force" (62). Darwin meant the term metaphorically but that did not stop readers from sensing an implied personification. Buckley pre-empts misinterpretation by directly personifying

natural selection as "Life." In Buckley's writing, the maternal metaphor of "Life" offers associations with nurture and guidance as well as with fertility. Again, Buckley's spiritualist leanings surface as this largely benevolent force in nature spurs on all creatures in the evolutionary process to higher, more complex forms.

After reading the first two chapters of Life and Her Children, Darwin wrote to Buckley on 14 November 1880, congratulating her on treating evolution "with much dexterity and truthfulness" and remarking "who can tell how many naturalists may spring up from the seed sown by you" (qtd. in Lightman, Victorian Popularizers 253). Bernard Lightman points out that Darwin's praise of Buckley's work reveals he had missed the spiritualist subtext, assuming her character of "Life" was a mere literary device for the story of evolution. While I agree that Buckley personifies Life due to her spiritualist belief in a life-principle permeating the world, I argue that Buckley purposely creates an ambiguous interpretation with her character of Life. Life could be seen as another innocuous fairy-like metaphor as Buckley uses in The Fairyland of Science. Only those who were aware of her spiritualist beliefs would have considered a deeper significance to the frequent references to Life.

Due to her roles as both a popularizer and as a woman, Buckley must have known presenting any overtly unorthodox ideas would have been drawn harsh criticism from the scientific world. She had already seen how Wallace's reputation had suffered because of his association with spiritualism. Darwin was unaware of Buckley's beliefs and felt confident that her work would not result in her being "called a dangerous woman" (qtd. in Lightman, Victorian Popularizers 253) because of any unorthodox views. To Darwin and other scientists, the inclusion of any religious themes was likely designed "to blunt potential criticism of her book as materialistic" (Lightman 253). Buckley likely uses her account of evolution "as a means of subverting the secularizing goals of Huxley and other scientific naturalists" (222). Influenced by her spiritualist beliefs, Buckley returns a spiritual presence to the evolutionary narrative in the form of the fairy "Life."

At the end of Life and Her Children, Buckley describes the highly organized and social insect, the ant. After pointing out the sense of duty to their colony that ants have developed, Buckley indicates the idea that would become the main theme of the second volume: mutual sympathy among the higher animals. She says, "We must turn for the development of fuller sympathy to that other branch, the

key-note of whose existence is the relation of parents to children, of family love" (301). The idea of mutual help and sympathy is Buckley's own perspective on evolution, informed by her spiritualist beliefs. As with Wallace, Buckley believes that spiritual forces have directed evolution, thus fostering sympathy as one of "the most noble incentives which can be employed in fighting the battle of life" (301).

In 1882, Buckley followed Life and Her Children with its sequel, Winners in Life's Race. Whereas the first volume covers the first six divisions of animal life, Winners focuses entirely on the seventh, the vertebrates, or as Buckley refers to them, the "great backboned family." In the preface, Buckley writes that the book "will have fully accomplished its purpose if it only awakens in young minds a sense of the wonderful interweaving of life upon the earth, and a desire to trace out the ever-continuous action of the great Creator in the development of living beings" (viii).

In the opening line of Winners in Life's Race, Buckley proclaims, "Life, life, everywhere life!" (1), referring to the fecundity of life on the planet, which in turn leads to a natural struggle for existence. To set the stage for the present volume about the vertebrates, she acknowledges that

“these lower forms [the invertebrates], however, were not destined to have all the world to themselves, for in ages, so long ago that we cannot reckon them, another division of Life’s children had begun to exist which possessed advantages giving it the power to press forward far beyond the star-fish, the octopus, or the insect” (3). Again, Buckley presents Life as a power with intentionality as she explains that with the invertebrates, “we watched Life trying different plans, each successful in its way, but none broad enough or pliable enough to produce animals fitted to take the lead all over the world” (9). Life devises a new plan for the back-boned family, one that provides a solid skeleton as “an actual support to the whole creature, growing with it and forming a framework for all its different parts” (6).

As with the previous volume, Buckley here proceeds in a straightforward fashion, from fish to amphibians -- to show the advancement of animals from sea to land -- and from reptiles to birds and mammals to illustrate the differences between cold- versus warm-blooded animals. Buckley reminds us, however, that “we are not following a direct line upwards, but a family tree, which branches in all directions” (240). Recalling her child readers, Buckley also simplifies the language without diluting it too much.

She translates Latin zoological terms, for instance, to everyday English labels: vertebrates are "the back-boned family," the mammalia, the "milk-givers"; the rodents, the "gnawers"' the insectivora, the "insect-eaters"; and the marsupials, the "pouch-bearers."

As she did in The Fairy-land of Science, Buckley encourages her readers to use their imaginations in understanding the various forms of life. In the second chapter, for example, Buckley describes fish life, chastising those people who would base their understanding of the underwater world by only peering into it from without. Such a person would "only see there the reflection of his own thoughts and ideas, and learn very little of how the fishes really feel and live" (21). If we are to truly understand creatures so different from ourselves, "we must forget for a time that we are land and air-breathing animals, and must plunge in imagination into the cool river or the open sea, and wander about as if the water were our true home" (21). Imagination is also needed to understand the immense length of time that has occurred during the evolutionary process: "And now if we want to read the history of all these strange forms, you must let me take you by the hand and lead you in imagination back, back through millions of years, to a time so long ago that we

cannot even count the ages between" (35). Clearly, as Barbara Gates notes, Buckley's narrative strategies owe a great deal to Lyell and his ability to discuss geological deep time ("Revisioning" 172). Tackling the animal kingdom in Life's Children and Winners, Buckley has to balance a detailed description of individual species with a panoramic picture of evolution across epochs.

In tracing the evolution of true sympathy in Winners, Buckley does not ignore the death and violence inherent in natural selection but neither does she highlight it in her narrative. Instead, she shifts the focus to the gradual development of sympathy, by providing multiple examples of a parent loving and protecting its young. With the lowest of the vertebrates, Buckley describes the beginnings of sympathy in fish:

> And when, low though they are in the scale of life, we find them (though curiously enough always the fathers) carrying the eggs, building nests for them, and defending the young, we see that even here, in the very beginning of backboned life, we touch the root of true sympathy, the love of parent for child. (69)

And in even those creatures that traditionally have been seen as emotionless, Buckley points out that gentleness and kindness are returned: "It is, perhaps, natural that we should shrink from cold-blooded creatures, especially as they seem [emphasis Buckley's] to show very little

affection. Yet lizards, tortoises, and snakes can all be made to know and care for those who are kind to them" (122). Buckley even uses the loyalty of man's best friend to illustrate her case, emphasizing that killing in the animal kingdom may be necessary for survival but the quality of sympathy is also needed:

> Remember that this hunting and killing is not for pleasure but for daily bread, and that the wolf and jackal at home are good, tender, and loving parents; and, moreover, that they have both of them been tamed and shown great affection to man. (286)

In her account of the vertebrates, Buckley continually underscores examples of parental love, seeing evolution in moral terms as well as physical ones similarly to Kingsley's idea of providential evolution. Buckley, though, applies the idea of sympathy to all vertebrates and not just to man, thus avoiding an anthropocentric view of evolution.

Toward the end of the volume, Buckley switches from zoological descriptions to historical commentary to give her readers an appreciation of how much change modern science has initiated. She describes the changes in how the natural world is viewed: "the naturalists of fifty years ago could have no grander conception than that new creatures were separately made (they scarcely asked

themselves how) and put into the world as they were wanted" (345). Moving from the idea of fixity of species to that of evolution only became possible because

> there was growing up among us the greatest naturalist and thinker of our day, that patient lover and searcher after truth, Charles Darwin, whose genius and earnest labours opened our eyes gradually to a conception so deep, so true, and so grand, that side by side with it the idea of making an animal from time to time, as a sculptor makes a model of clay, seems too weak and paltry ever to have been attributed to an Almighty Power. (345-46)

Buckley's respect and admiration for Darwin and his ideas are clearly evident as she brings Darwin himself into her narrative.

Building her inductive argument throughout the book by revealing the presence of sympathy in various species, Buckley states her thesis about the moral dimension of evolution toward the end of the volume:

> [O]ne of the laws of life which is as strong, if not stronger, than the law of force and selfishness, <u>is that of mutual help and dependence</u> [emphasis Buckley's]. Many good people have shrunk from the idea that we owe the beautiful diversity of animal life on our earth to the struggle for existence, or to the necessity that the best fitted should live, and the feeblest and least protected must die. They have felt that this makes life a cruelty, and the world a battlefield. This is true to a certain extent, for who will deny that in every life there is pain and suffering and struggle? But with this there is also love and gentleness, devotion and sacrifice for others, tender

> motherly and fatherly affection, true friendship, and a pleasure which consists in making others happy" (351).

This law is not a special gift granted to humankind by their Creator; it was gradually developed among the vertebrates as part of the evolutionary process. Buckley agrees with Darwin that "the social instincts were an extension of the parental and filial affections" (Dixon 157). Darwin had established this idea in The Descent of Man (1871), but Buckley goes beyond him, foregrounding the significance of parental love and using it as the central metaphor of her work:

> It [sympathy] may appear dimly at first, -- it may take a hard mechanical form in such lowly creatures as insects, where we saw the bees and ants sacrificing all tender feelings to the good of the community. But in the backboned family it exists from the very first as the tender love of mother for child, of the father for his mate and her young ones, and so upwards to the defence of the tender ones of the herd by the strong and well-armed elders, till it has found its highest development in man himself. (352)

Darwin's idea of natural selection includes an additional law, according to Buckley, that of mutual aid and sympathy. Her "Life" has directed the evolutionary process toward that goal.

In all three of her major works, Buckley seeks to cast a spell, one that enchants readers and thus holds their attention as they enter the fairy realm of science.

Ironically, while science strives to explain the world and remove the supernatural, Buckley's success as a science popularizer lies in her ability to invest science with the power formerly ascribed to the magical. An anonymous reviewer in the January 1884 issue of The American Naturalist describes Winners in Life's Race, for example, as "the most successful attempt at a popular sketch of modern zoology with which we are acquainted" (47). Focusing on Buckley's writing style, the reviewer continues that, with her "easy and graceful pen," she has created a story that "will charm the grown-up naturalist, and, as we have reason to know, interest an intelligent lad" (50). In all her books, Buckley underscores the ability of science to illuminate the natural world. In a desire reminiscent of natural theology, she hopes her readers learn that "there is a world of wonder which we may visit if we will; and that it lies quite close to us, hidden in every dewdrop and gust of wind, in every brook and valley, in every little plant or animal" (Fairyland 124).

In 1884, Buckley married Dr. Thomas Fisher. By 1888, she had given up lecturing but continued to write under her maiden name. Two years later she published a sequel to The Fairyland of Science, titled Through Magic Glasses (1890). In this children's work, she focuses on the metaphor of

sight in examining the wonders revealed by the telescope, stereoscope, photographic camera, and microscope. In 1891, Buckley returns to the spiritual dimensions of evolution in her Moral Teachings of Science, a work directed at a general adult readership. She reiterates her ideas about the development of sympathy and love in the higher animals. She also discusses the concept of immortality in humankind, speculating about how our immortal spirit may also be evolving to a higher existence in which sympathy merges the individual self with others. In 1901, Buckley published her last works -- brief introductory nature books for children in the Eyes and No Eyes series: Wild Life in Woods and Field, By Pond and River, Plant Life in Field and Garden, Birds of the Air, Trees and Shrubs, Insect Life. Having retired with her husband and moved to Devon, Buckley died of influenza in 1929 at the age of 89.

In this chapter, we have seen that Buckley possesses a remarkable ability to synthesize factual information and to shape an entertaining and instructive narrative for young readers. She was keenly aware that science, both practical and theoretical, was conveyed as a literary construction. Her rhetorical use of fantasy underscores the wonder and magic of science, enlivening her factual narrative in The Fairyland of Science. In her evolutionary epics, Life and

Her Children and Winners in Life's Race, Buckley, like Kingsley in The Water-Babies, emphasizes the moral dimensions of evolutionary thought. In contrast to Kingsley's anthropocentric interpretation, however, Buckley's spiritualist beliefs encompass all of the animal kingdom in promoting moral evolution. The law of sympathy, Buckley argues, makes nature a noble moral teacher.

Notes

[1] Lyell had refined and popularized the ideas of James Hutton, an eighteenth-century Scottish geologist. According to Hutton's Theory of the Earth (1795), the planet had been shaped by slow-moving forces, which had acted over very long periods of time, a geological concept known as deep time.

[2] Wallace was sometimes referred to as the father of biogeography. In his field studies, he noticed a clear division among species in the East Indies, a demarcation that came to be known as the Wallace Line. The line divides Indonesia into two distinct regions, one in which animals closely relate to those of Australia and one in which the species are mainly of Asian origin.

[3] For thorough introductions to spiritualism in the late Victorian period, see Janet Oppenheim's The Other World: Spiritualism and Psychical Research in England, 1850-1914 (1985) and Alex Owen's The Darkened Room: Women, Power, and Spiritualism in Late Victorian England (2004).

[4] In 1888, Margaret Fox confessed that she and her sister intentionally created the rappings heard at their séances by cracking their joints, particularly their toes. Fox recanted her confession a year later.

[5] Buckley's choice in publishing anonymously may have been due to her prudent nature, as is apparent in her comments about Wallace's "want of worldly caution" about his own unconventional beliefs.

[6] For other examples of evolutionary epics contemporaneous with Buckley's, see David Page's Past and Present Life of the Globe (1861) and Edward Clodd's Story of Creation (1888).

Conclusion

> My dear child, as your eyes open to the true fairy tale which Madam How can tell you all day long, nursery stories will seem to you poor and dull. All those feelings in you which your nursery tales call out, -- imagination, wonder, awe, pity, and I trust too, hope and love -- will be called out, I believe, by the Tale of all Tales, the true "Märchen allen Märchen,"
>
> Charles Kingsley, Madam How and Lady Why (1870)

In writing this dissertation, I owe a great deal to critics and historians such as Barbara Gates and Bernard Lightman whose work since the 1990s has re-introduced this genre to Victorian studies. Many natural history writers express throughout their works a sense of profound awe, wonder, and spiritual response to the natural world while advocating, to varying degrees, an appreciation for scientific learning. In addition to my main focus on children's writers, I have introduced a number of important issues regarding Victorian natural history writing, any one of which could serve as a springboard to further study.

First, one area apparent from my dissertation is the important avenue natural history and science provided for women in the second half of the nineteenth century. Women such as Margaret Gatty and Arabella Buckley found a voice for nature and for themselves in their writing. Feminine interest in natural history had grown throughout the

century, first as an approved rational amusement in the 1820s and 1830s and then as a passionate avocation in the crazes of the 1840s and 1850s. Many of those women who found more than a pastime in natural history eventually turned to writing. In sharing their love of natural history in their popularizations, they also accepted the traditional feminine responsibility of educating the uneducated and the young. A few even succeeded in earning a living through the writing, artwork, or lecturing about nature.

Secondly, the generic forms and narrative approaches these writers chose reflect the increasing literary diversity within natural history writing as it strove to compete with mainstream literature. Fairy tales, self-help books, scientific romances, realistic novels, travel literature -- all competed with natural history to find a readership. In addition to children's literature, other media -- the periodical press, school textbooks, scientific travel accounts, encyclopedias, editorial cartoons, and evangelical tracts -- need to be examined to understand how science and nature were popularized at all levels of Victorian society.

Lastly, studies have only begun to explore the relationship between professional scientists and

popularizers. Who speaks for science? What kinds of stories should be told about science? How did the audience -- child and adult -- respond to natural history and science writing? Scientists such as T.H. Huxley and John Tyndall were also popular writers and lecturers. How do they fit in with Arabella Buckley and Charles Kingsley? The sometimes competitive and sometimes complementary relationships between professionals and popularizers offer a rich terrain for valuable investigations in recovering natural history writers from the Victorian period.

And finally, what about the fading belief in natural theology as the nineteenth century progressed? My dissertation shows how three writers rebelled against, compromised with, and/or accepted natural theology's decline in the face of science. Fantasy restored a sense of mystery and magic about the world for Gatty, Kingsley, and Buckley. How did other writers -- women, working class, evangelicals -- approach natural history when faced with the growing secularization of nature? Exploring this issue, as well as the others I have raised, will increase our appreciation of a neglected genre and better inform our understanding of nineteenth-century science.

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