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'Dear Child': Talking to Children in Victorian and Edwardian Publications for Children
Adult-Led Conversations Between Adult Narrators and Child Readers

Reverent Induction: Epistemology and the Romantic Education of the Child Reader in Charles Kingsley's *The Water-Babies* (1863)

L'induction révérencieuse : épistémologie et éducation romantique de l'enfant lecteur dans The Water-Babies (1863)
de Charles Kingsley

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Abstracts

Français English

Dans ses essais et sa fiction pour la jeunesse, Kingsley prône le raisonnement inductif, le processus par lequel on fait des généralisations à partir d'observations spécifiques, et critique le raisonnement déductif, le processus par lequel on parvient à des conclusions définitives sur la base de théories générales. Pour Kingsley, en faisant dériver un axiome général d'une observation concrète — l'inconnu à partir du connu — le processus du raisonnement inductif requiert un acte de foi qui ne peut être réduit à des formules logiques. Comme les Romantiques, Kingsley croyait que l'émerveillement et l'imagination de l'enfance sont essentiels pour générer ce qu'il appelait « l'induction révérencieuse » — la capacité de voir, dans chaque processus de raisonnement inductif, le projet divin pour la perception humaine. L'éloge du raisonnement inductif chez Kingsley, au détriment du raisonnement déductif, et l'influence des idées philosophiques des Romantiques sur son œuvre constituent un nouveau cadre interprétatif permettant de comprendre le rôle du narrateur dans *The Water-Babies* et la façon dont il converse avec l'enfant lecteur/lectrice. À travers son dialogue avec l'enfant qui écoute l'histoire, le narrateur tente de remettre en question l'épistémologie empirique et la logique déductive, deux façons de penser que Kingsley voit comme étant des menaces à l'induction révérencieuse. L'une des façons pour faire cela est de reproduire le processus de raisonnement analogique pour l'enfant lecteur/lectrice dans le but de remettre en question les hypothèses de la philosophie empirique et l'autre consiste à utiliser l'ironie et l'esprit pour satiriser ce qu'il voit comme la structure nonsensique du raisonnement déductif. Alors que la conversation

avec le jeune lecteur/la jeune lectrice opère dans la sphère de la logique et de la raison, le conte du narrateur représente symboliquement l'imagination Romantique et l'acte de foi transcendantal qui rend l'induction révérencieuse possible.

In his essays and fiction for children, Kingsley champions inductive reason, the process of making generalizations from specific observations, and criticizes deductive reason, the process of arriving at definite conclusions on the basis of general theories. For Kingsley, in deriving a general axiom from a concrete observation—the unknown out of the known—the process of inductive reasoning requires a leap of faith that cannot be reduced to logical formulations. Like the Romantics, Kingsley believed that the wonder and imagination of childhood were essential for fostering what he called 'reverent induction'—the ability to see in each process of inductive reasoning the unfolding of God's plan for human perception. Kingsley's praise of inductive reason in contrast to deductive reason, and the influence of Romantic philosophical ideas on his work, provides an entirely new interpretive framework for understanding the role of the narrator in *The Water-Babies* and his conversation with the child reader. Through his dialogue with the child listening to the story, the narrator seeks to challenge empirical epistemology and deductive logic, two ways of thinking that Kingsley sees as a threat to reverent induction. One way he does this is to model the process of analogical reasoning for the child reader in order to challenge the assumptions of empirical philosophy and the other is to use irony and wit to satirize what he sees as the nonsensical structure of deductive reason. While the conversation with the young reader operates in the realm of logic and reason, the narrator's fairy tale symbolically represents the Romantic imagination and the transcendent leap of faith that makes reverent induction possible.

Index terms

Mots-clés: épistémologie, raisonnement déductif, raisonnement inductif, induction révérencieuse, imagination, Romantisme

Keywords: epistemology, deductive reason, inductive reason, reverent induction, imagination, Romanticism

Full text

- 1 Charles Kingsley states in his lectures *Alexandria and Her Schools* that the life cycle of individuals is divided into three stages of thinking: 'youth is the time of free fancy and poetry; manhood of calm and strong induction; old age of deduction' (Kingsley 1854). While 'manhood' refers to inductive reason, the process of making generalizations from specific observations, 'old age' denotes deductive reason, the process of arriving at definite conclusions on the basis of general theories. In both his essays and fiction, Kingsley excoriates the logic of deductive reason and champions the process of inductive reasoning. Kingsley emphasizes that the science of inductive reason and his faith in God are not mutually exclusive since inductive reason, which must always revise its notions based on new observations of fact, requires faith in God's omniscience and in the unity of God's design. Kingsley acknowledges, however, that faith is not something that can ultimately be proved by reason. Herein lies the importance of Romantic philosophical ideas for Kingsley. Like the Romantics, Kingsley contends that the divine truths of nature cannot be known through logic and reason but are rather intuited by imagination and feeling. This is why Kingsley believes that the 'free fancy and poetry' of childhood is crucial for fostering 'reverent induction' (Kingsley 1854), the poetic wonder to recognize each act of induction—the process of inferring general axioms from concrete observations—as God revealing Himself in material fact for human perception. Without the imagination that leads to reverent induction, Kingsley contends that scientists are limited to an empirical view of the world, or they more easily fall into what he sees as the theoretical trap of deductive reason.
- 2 Kingsley shared Charles Dickens's worry that empiricism had devalued poetry and imagination in children's education, and he was alarmed that future scientists would be unable to apprehend God in nature because the mind itself had become increasingly limited by empirical philosophy. In her study of the depiction of science and imagination in nineteenth-century children's literature, Jessica Straley demonstrates that both the

humour of Kingsley's narrator and the fanciful elements of the fairy tale in *The Water-Babies* counter the empirical educational theory of Herbert Spencer to reveal the importance of imagination for apprehending the ideas of God. I agree with Straley, but what I would like to do differently in this essay is to show more specifically how the narrator uses his conversation with the child reader to challenge what he sees as the two ways of thinking that are a threat to reverent induction: empirical epistemology and deductive reasoning. The narrator uses two concurrent strategies to make his point. One is to model the process of inductive reason for the child reader in order to challenge the assumptions of empirical philosophy and the other is to use irony and wit to lampoon what he sees as the nonsensical nature of deductive reason. At the same time as the narrator converses with the child reader, the fairy tale symbolizes the Romantic imagination and the truths that transcend reason—divine ideas that can only be expressed in poetry and song. By embedding a dialogue with the child in his fairy tale, Kingsley strives to show the child reader how empirical concepts of knowledge and deductive theories that seek to systematize both the world and humankind are inherently limited without the poetic imagination and wonder that provide the transcendent foundation for the scientific process of reverent induction. Indeed, the fairy tale and the narrator's dialogue with the child reader represent different ways of knowing, and this distinction reveals that *The Water-Babies* is not only a novel about science but is also a novel about epistemology.

A Lesson in Logic and Reason

- 3 The narrator's conversation with the young reader offers the inverse of the imaginative education of the fairy tale in that it is essentially an education in logic and reasoning.
- 4 The narrator wants to model for the child how to use inductive reason to challenge empirical epistemology, which he sees as a narrow epistemological lens that precludes the wonder necessary for reverent induction. Empiricism is derived from the philosophers John Locke and David Hume, who proclaimed that we can only ever know things we have perceived through our senses, and that since all knowledge is experiential, it is ultimately circumscribed to our observations of empirical reality. Locke and Hume defined the cognitive faculties of the mind as the logical operations that made sense of this knowledge. As a result, the range of thought that had for centuries been held to be the domain of metaphysics, that is, everything beyond fact, was according to Hume 'nothing but sophistry and illusion' (Hume 1748, XIII, part 3). In the novel, Cousin Cramchild, a Gradgrind-like figure who seeks only to 'cram' empirical facts and information into children, represents for Kingsley the empirical worldview. Of course, Kingsley, as a proponent of inductive reason, was himself a man of fact, but he endeavours to show the child reading the story that empirical epistemology does not allow for the faith that makes reverent induction possible. This is why the narrator demonstrates to the child reader how to use reason to refute Cousin Cramchild's empirical assumptions and how to use Cousin Cramchild's own assumptions to undercut empiricism's foundational logic. Most importantly, in guiding the child to think logically, the narrator wants him or her to experience the inherent limits of reason.
- 5 The young reader reveals the influence of Cousin Cramchild when he interrupts the narrator's fairy tale to declare 'But there are no such things as water-babies' (Kingsley 1863, 37). The narrator proceeds to draw the child into a logical discussion by asking 'How do you know that? Have you been there to see?' (37) It is at this point that the narrator gives the child reading the story his first lesson in reason by showing him or her how to use the very premise of empiricist philosophy to argue against its conclusions. If indeed all knowledge is derived from experience, then it is not logically possible for an empiricist to disprove the existence of water-babies. The narrator explains to the child that 'no one has a right to say that no water-babies exist, till they have seen no water-babies existing; which is quite a different thing, mind, from not seeing water-babies' (38).

Logically speaking, to 'have seen no water-babies existing' is not the same as 'not seeing water-babies' because to prove nonexistence through the experience of having not seen water-babies exist would require Cousin Cramchild to have experienced all things, and to attain this knowledge would mean that he would need to have simultaneous access to all parts of the world and beyond. Thus, the narrator shows that it is not logically possible to prove a universal negative, which is something he later points out to the deductive scientist Professor Ptthmlnsprts. At the same time, the narrator gently leads the young reader towards making the inference that only God has this omniscience and omnipresence, and that knowledge of water-babies must therefore transcend the cognitive limits of empirical epistemology.

6 When the child reader continues to espouse Cousin Cramchild's empirical assumptions, exclaiming that: 'But a water-baby is contrary to nature' (38), the narrator seeks to show why it is we cannot say that something is contrary to nature but only that it is contrary to what *we know* about nature. The narrator assures the child that 'even the wisest man knows only the smallest corner, and is, as the great Sir Isaac Newton said, only a child picking up pebbles on the shore of a boundless ocean' (38). For Kingsley the poetry of nature transcends knowledge because 'All things are constituted to a Divine and Wonderful Order, which links each thing to every other thing; so that we cannot fully comprehend any one thing without comprehending all things: and who can do that, save He who made all things?' (Kingsley 1856, 138) The grand mysteries of God's design are unfathomable to reason and logic and yet for Kingsley in accepting that there will always be more facts to observe and discover, and more connections to make between these facts, humans can infer a divine totality.

7 It is this relationship between fact and inference that explains the importance of inductive reason for Kingsley. In *Alexandria and Her Schools*, Kingsley holds Bacon's natural philosophy up as an example of reverent induction in comparison to Aristotle's use of deductive reason. Bacon rejected the logic of Aristotle, which determined true propositions on the basis of theoretical formulas, in favour of a series of stages in which the scientist moves from concrete facts to axioms, from these axioms to more general axioms, and from more general axioms to the fundamental laws of nature, using inductive reasoning to chain each stage together. But for Bacon, no fundamental law is ever truly immutable because further induction allows for the possibility of another fact arising that conflicts with the general law, requiring a new law to accommodate the previous facts as well as the new. In drawing a theory from concrete observation, inductive reason infers the unknown out of the known, and thus Kingsley observes that the expressions 'instinctive' and 'inductive' are actually 'nearer akin than most fancy' (Kingsley 1854). He concludes therefore that 'each separate act of induction' is in fact a 'mysterious and transcendental process which cannot, let logicians try as they will, be expressed by merely logical formula' (Kingsley 1854).

8 When facing empiricists like Cousin Cramchild, the narrator advises the child to reject empirical assumptions by relying upon his own inductive reason and encourages him to observe what has been discovered already so as to make an inference about the existence of the many things that have yet to be discovered, including water-babies. The narrator reminds the child 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' (Kingsley 1863, 39). Here the narrator models an example of the inductive method by showing the child reader how to use analogical reasoning against his empiricist adversary. Using the example of M. Du Chaillu, he asks the child to imagine his own sceptical reaction to the explorer's description of an elephant if he had not already known about its existence, just as the French doubted Le Vaillant's claim to have shot giraffes: 'People would surely have said, "Nonsense; your elephant is contrary to nature"; and have thought you were telling stories' (39). Drawing on further analogies, the narrator guides the child to infer that what people think is contrary to nature is actually only contrary to what we currently take for granted. The narrator then suggests that if Cousin

Cramchild continues to fall back on his empirical premises and 'says (as he will) that not having seen a change in his experience, he is not bound to believe it' then the child reader should 'ask him respectfully where his microscope has been?' (42) Following the narrator's example of analogical reasoning, the young reader is invited to tell Cousin Cramchild that new discoveries are indeed possible because strange things happen every day, strange things that we have not yet assumed to be self evident.

9 When the narrator anticipates that Cousin Cramchild will continue to make sceptical arguments about water-babies, he encourages the child not to be 'put down' by these arguments but to 'stand up to him like a man' (41) by using similar processes of analogical reasoning. Finally, the narrator exclaims that if Cousin Cramchild will still not listen to inductive reason then the child reader should again use empirical assumptions to silence his opponent: one way for him to do this is to 'tell him [Cramchild] that if there are no water-babies, at least, there ought to be, and that, at least, he cannot answer' (42). The narrator has in mind Hume's observation in *A Treatise of Human Nature* that moral or prescriptive statements—what people 'ought' to do—cannot be derived logically from factual or descriptive statements—what 'is' (Hume 1739, Bk. 3, Section 1). Hume used this observation to argue against notions of moral reason, but the narrator encourages the child to practice using this fact-value distinction in order to see how empiricism locks itself into a view that is entirely circumscribed to the material world. In helping the child reader to use empirical premises to undercut Cousin Cramchild's participation in the hypothetical argument, the narrator wants him or her to realize that empiricism is not a self evident truth but in fact a theory, a theory that the child can choose to agree with or not.

10 The narrator has walked the child reader through several examples of analogical reasoning because he wants to establish a logical baseline that will put the child in a better position to understand the more complex argument he is about to make. An analogical argument is constructed establishing similarities between two or more things in order to make an inference about some further similarity that exists. The narrator takes Cousin Cramchild's premise that physical transformations only take place in lower animals and not in humans to guide the child through three stages of analogical reasoning that will help to make an inference about the existence of life after death. The narrator's first premise is that lower animals undergo metamorphoses; his second is that humans also undergo metamorphoses like lower animals (here the narrator uses a nested analogy to prove this premise by showing that in birth humans undergo transformations similar to the transformations of a sea-egg or a butterfly); his third premise is that human transformations are on a more complex scale than those transformations in lower animals (another nested analogy illustrates this through the comparison of rabbits building a burrow and the establishment of the Great Exhibition); which leads the narrator to infer that this higher transformation is of a spiritual nature and that humans will experience another transformation after death. Thus he concludes 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' (42).

11 Of course, as the narrator has told the child reader already, analogical arguments involve a leap of faith. When the narrator asks the child to consider that he has a soul he cannot see, just like a steam engine is moved by invisible steam, he makes a further inference that the world is run by fairies whose unheard music makes the world turn round. But this final inference he reveals will require 'make believe', and he warns the child reader that 'It will not be the last time by many a one that we will have to make believe' (33). Believing in fairies therefore symbolizes in the novel the leap of faith that for Kingsley is required for reverent induction. Indeed, the narrator wants the young reader to practice analogical reasoning so he or she can see that reason can only go so far before imagination comes in to complete the final step.

12 The purpose of the narrator's conversation so far has been to demonstrate through inductive reason how the child reader can think for himself and herself. We see this when the narrator responds to the child speaker's surprise that Tom has forgotten about being a

dirty little boy after he becomes a water-baby: 'That is not strange: for you know, when you came into this world, and became a land-baby, you remembered nothing. So why should he, when he became a water-baby?' (47) This analogical reasoning prompts the child to ask a question that is derived from his or her own inductive reason: 'Then have you lived before?' At this point, the narrator admits to the child that he cannot answer this question because this is as far as reason can take them, and so he tells the child reader to look for the answer instead in Wordsworth's 'Immortality Ode'. For Kingsley, the poem takes over precisely where reason leaves off because poetry evokes a divine feeling that transcends reason and so it imparts an intuitive knowledge of truth. The narrator encourages the child reader to believe in Wordsworth's poem 'For then 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' (47). For Kingsley, without poetry science is harmful because it imprisons the scientist in a materialistic view of the world, whereas science that is conceived of poetically, that is through imagination, intuits the divine order manifested in the laws of nature, laws which are then discovered through the process of reverent induction.

Irony and the Narrator's Critique of Deductive Reason

13 While the narrator models the process of inductive reason to encourage the child reader to challenge the assumptions of empirical philosophy, he turns to wit and irony when he wants to satirize deductive reason, the process of arriving at definite conclusions on the basis of general theories. In most instances after the narrator has guided the child toward truth through inductive analogy, he follows this revelation by appearing to undermine his own conclusions. This move on the part of the narrator is signalled by the sudden elevation of his condescending tone toward the child Ellie in the story. While this could be seen as an example of the overbearing didacticism of the narrator, it is important to recognize that the narrator only takes on this tone when he is mocking deductive reason. Taking on the theoretical voice of deductive reason, the narrator walks the reader through its processes so that the child reader can experience the circular nature of its logic. The narrator inserts humorous or even ludicrous elements into these frustrating cycles of logic in order to highlight what the logical mechanism of deductive reason is and what he believes its limits to be, and this is always indicated by the narrator's shift in tone.

14 Aunt Agitate's political economy is one of many examples in the novel of what Kingsley sees as the absurdity of deductive reason, because instead of starting with fact it begins with a theory—in this case the utilitarian theory of the greatest happiness principle—in order to draw conclusions about social, economic or political decisions. The other main proponent of deductive reason in the novel is Professor Pthmlnsprts and the narrator takes on a mock condescending tone toward the young girl Ellie and the child reader in order to expose the limitations of the professor's epistemological worldview. While the narrator exclaims that 'little Ellie was, I suppose, a stupid little girl' (87) for disagreeing with the Professor about the existence of water babies, he proceeds to use the controversial debate between Richard Owen and T. H. Huxley to lampoon Pthmlnsprts's use of deductive reason. Owen endeavoured to undercut the Darwinian notion that humans descended from apes by arguing that humans have a distinctive part of the brain called the hippocampus minor. When this same feature was discovered in apes, Huxley claimed that it proved beyond doubt that humans were descended from apes, which is the position taken by Professor Pthmlnsprts. Kingsley's narrator invokes this debate as an opportunity to ridicule the processes of deductive reason, and he alerts the reader to his satire by humorously renaming the hippocampus minor the 'hippopotamus major'.

15 Using this contemporary debate, Kingsley's narrator demonstrates how deductive reason draws a conclusion by proceeding from the assumption that its premise is true. In

this case the premise is that to be human is to have a hippopotamus major. According to the logic of the first premise: if you have a hippopotamus major, you cannot be an ape, even if you are obviously an ape, and if one ape has a hippopotamus major, all humans must be apes. Thus the premise forces us to declare that anything with a hippopotamus major must be labelled human, even if it is not, and therefore if one ape is found to have a hippopotamus major, we are forced to declare the opposite, which is that all humans are apes, even if they are not (85). The narrator reveals a logical chain that is bound to the assumed truth of the premise, even if the conclusions are patently in conflict with each other. He shows that Professor Pthmlnsprts refutes Owen through the same inflexible structure of logic that is utilized by opposite sides to reach opposite conclusions.

16 Kingsley's narrator ironically takes on a mock contemptuous tone toward the child to emphasize what he sees as the limitation of deductive reason: the fact that the 'truth' of its conclusion is contained in the 'truth' of the premise: 'No, my dear little man; always remember that the one true, certain, final, and all-important difference between you and an ape is, that you have a hippopotamus major in your brain, and it has none' (85). The narrator's mock patronizing tone when speaking to the child reader indicates that this premise is wrong because its conditions are overly specific. For Kingsley, what is human cannot be reduced to a small part of the brain. The narrator again adopts his belittling attitude toward the young reader to show that it is actually deductive reason that is nonsensical and not the child's intuition: 'You may think that there are other more important differences between you and an ape such as being able to speak, and make machines, and other little matters of that kind: but that's a child's fancy, my dear' (85). The transcendent attributes that for Kingsley separate humans from apes such as faith, charity, and hope are self evident to the child who uses his or her intuition.

17 In ironically taking on the voice of deductive reason, the narrator reveals its limitations and demonstrates to the child reader that Ellie's intuition is far superior to Professor Pthmlnsprts's logic. While Professor Pthmlnsprts quickly dismisses the existence of water-babies, Ellie claims that they must exist because she saw something similar in the painting *The Triumph of Galatea*: 'I have looked at it ever since I was a baby, and dreamt about it a hundred times; and it is so beautiful, that it must be true' (146). Ellie, without knowing it, has proclaimed Plato's notion that beauty, the only form apprehended through the senses, also takes the viewer to the true and the good. The narrator exclaims: '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"' (146). Turning to the child reader, the narrator explains that people will only understand the importance of Ellie's statement once they give up 'believing that Mr John Locke (good man and honest though he was) was the wisest man that ever lived on earth: and recollect that a wiser man than he lived long before him; and that his name was Plato the son of Ariston' (146). The narrator rejects Locke's empiricist philosophy to suggest to the child that Plato's idealism offers a superior way of viewing the world.

18 Deductive reason is satirized by Kingsley's narrator for its fruitless logic, as well as for being an anathema to what he sees as the role of the teacher. As a champion of inductive reason, Kingsley believes that whenever someone uncovers a conflict between his or her general beliefs in concrete cases, he or she should regard this conflict as revealing a weakness in the general principles. Indeed, this is the very nature of inductive reasoning in the physical sciences: when objective data contradicts an established general principle, this requires revision in the general principle and it is this process of induction that leads to scientific progress. In contrast to the inductive method, Kingsley contends that deductive reason breaks down the instant a new fact enters his schema and contradicts its premise. When Professor Pthmlnsprts and Ellie discover Tom, instead of feeling humbled and reverent toward the mystery of the universe that is continually being revealed to those who have faith, Professor Pthmlnsprts refuses to reconsider his premise. Kingsley sees this as an example of the worst kind of mental dictatorship that stifles creative thought in children. Kingsley is criticized for the didactic tone of his narrator,¹ but like the narrator,

Kingsley sees himself as a teacher who guides children to discover new facts for themselves in a divine process that continually reveals new properties in God's unfolding plan.

19 Professor Pthmlnsprts's inability to accept the existence of water babies, even after he has seen one for himself, demonstrates the inability of deductive reason to incorporate new facts into its logical structure. As we have seen, Kingsley shows that the chain of reasoning breaks down the instant that a new fact contradicts its fundamental principle, and this is represented symbolically in Professor Pthmlnsprts's psychological breakdown. When after his breakdown the professor writes a book arguing the opposite to all of his old opinions, Kingsley's narrator again takes on the voice of deductive reason to walk the child reader through its needlessly circular logic, and just as he did with the Owen-Huxley debate, he reveals the limitation of this deductive way of thinking by using the same humorously faulty premise to ostensibly question the professor's position.

20 The premise of Professor Pthmlnsprts's study is that there is life on the moon which leads him to conclude that the moon is made of green cheese and that there are mites on the moon which hatch to become children. The narrator sees that there is something wrong with this argument and seeks to disprove the conclusion, but rather than inquiring into the original premise about the existence of life on the moon, he humorously proceeds to disprove merely that there can be no water-babies on the moon, and re-enters into the chain of reasoning that is dictated by the first premise. The narrator declares that Professor Pthmlnsprts must be wrong 'for this one reason: that, there being no atmosphere on the moon' (98). He continues to explain his logic:

I say, there being no atmosphere, there can be no evaporation; and, therefore, the dew point can never fall below 71.5 below zero of Fahrenheit; and, therefore, it cannot be cold enough there about four o'clock in the morning to condense the babies' mesenteric apophthegms into their left ventricles; and therefore, they can never catch the whooping cough; and if they do not have whooping cough, they cannot be babies at all; and therefore, there are no babies on the moon. (98)

21 The irony of the argument is revealed not only through satirizing the rigid structure of deductive reason but also by the ludicrous nature of the conditions that he postulates. We can see in the narrator's argument an analogous process to the one that he satirized in the debate between Owen and Huxley: the fact that in using deductive reason, both parties reach opposite conclusions from the same original premise. The narrator wants to show that holding two contradictory conclusions which stem from the same premise undercuts our faith in what we had believed to be its veracity. The narrator finalizes his mock assertions with Q.E.D, an abbreviation of the Latin words 'Quod Erat Demonstrandum' (that which was to be demonstrated), to declare that the logical proof is complete. Of course, this is entirely ironic because as the narrator has shown, nothing has in fact been demonstrated or established. The narrator again reiterates what he perceives to be the absurdity of deductive reason to the child reader: 'Which may seem a roundabout reason; and so, perhaps, it is: but you will have heard worse ones in your time, and from better men than you are' (98), essentially warning him or her to be attentive to the fact that even the most accomplished thinkers become trapped in its logic.

22 The narrator returns again to his mock pompous tone when he discusses the genre of the fairy tale with the child reader. After prompting the child reader to infer the existence of fairies through inductive reason, he undermines what he has just said by taking on the perspective of deductive reason: 'And yet, after all, there is no need for that. There must be fairies; for this is a fairy tale; and how can one have a fairy tale if there are no fairies' (33). The narrator's use of the deontic modal here, which reveals the assumption or expectation that reality conforms to the speaker's desires, demonstrates that deductive reasoning masquerades as neutral logic but in fact relies on direct intervention. He shows the child that his statement is an example of deductive reason because he is drawing conclusions from what he expects to find in a fairy tale: it must have fairies, must be 'all fun and pretence' (43), cannot include a moral (174), and centres around the marriage of nobles (188). The irony is patent here since the child reader can perform his or her own

evaluation of the veracity of the premise and use his or her own experience to easily figure out that fairy tales cannot be limited to such a narrow theoretical formula. That the narrator sees this humorous faulty logic as the same logical foundation of more serious arguments is clear when he responds to the child reader's obvious scepticism regarding his claims: 'You don't see the logic of that? Perhaps not. Then please not to see the logic of a great many arguments exactly like it, which you will hear before your beard is grey' (33). This is also a serious point because as the narrator wants to make clear, his fairy tale cannot be reduced to such a formula since its symbolism transcends the scope of logic and reason.

The Poetry of Faith and the True Fairy Tale

23 At the same time that the narrator's dialogue reveals the limits of deductive reason and seeks to guide toward the process of reverent induction, the child reader has also been given an alternative education by the fairy tale. Indeed, the function of the fairy tale in the novel reveals the influence of Romantic poetic and philosophical ideas on Kingsley, particularly the ideas of German Romanticism. The German Romantics did not see fairy tales as simply frivolous amusement for children but rather as having crucial epistemological importance. In his seminal *Dialogue on Poetry*, the German Romantic philosopher and critic Friedrich Schlegel exclaims that only imagination can grasp the divine essence of nature, and thus it is 'this mysterious quality' that 'is the source of the fantastic in the form of all poetic representation' (Schlegel 100). The fairy tale, then, is not simply an amusing story but is rather a symbolic representation of the spiritual essence of nature apprehended by imagination. Indeed, as Felicia Bonaparte has shown (260), the fairy tale for the German Romantics comes to represent the imagination itself.

24 The German Romantics feared that the Enlightenment emphasis on reason and the prevailing materialism and scepticism which had emerged from empiricism meant that the human mind could no longer perceive such a fairyland—the mystical core of nature apprehended through imagination. In his *Sketches*, the German Romantic philosopher and poet Novalis exclaims that 'It is only because of the weakness of our organs, and of our self-reflection, that we do not see into a fairy world. All fairy tales are only dreams of that home that is everywhere and nowhere. The higher powers in us that once, as genius, executed our will, are now muses that refreshen us with sweet memories during this dreary journey' (Novalis 85–86). For Novalis, the modern emphasis on reason, which for him is the weaker epistemological faculty because it is bound to the material, has made us blind to the magic of nature. Fairy tales enable us to perceive once again the transcendent reality known to imagination but that is inaccessible to reason.

25 The sudden transition from a realistic narrative that follows the unfortunate chimney sweep, Tom, into the fantasy fairy tale land of the water-babies has often been seen as a strange inconsistency in Kingsley's novel,² but this is in fact a crucial iteration of Kingsley's Romantic inheritance, where the realistic and fantastic narratives represent two ways of knowing. While the interpolation of the narrator and his conversation with the child reader operate within the space of logic and reason, the poetry and music of the fairy tale awaken the child's imagination.

26 Anna Neil, Anne Chassagnol, and Piers J. Hale, among others, have shown how Kingsley uses his fairy tale to represent aspects of evolutionary theory and elements of natural history. However, for Kingsley this is not only an entertaining way of explaining science to children, but conveys how nature cannot be understood in all its mystery without poetry, since for Kingsley it is imagination and feeling that apprehend divine ideas in the material world. Indeed, Kingsley reveals his German Romantic concept of fairy tales when his narrator exclaims in *Madam How and Lady Why* that nature itself is the real fairy tale:

'the Tale of all Tales, the true "Marchen allen Marchen"' (Kingsley 1869). Nature is the true fairy tale for Kingsley because when conceived of through imagination the real is revealed to be a symbolic manifestation of the divine.

27 As we have seen, Kingsley argues that to have reverent induction in manhood, the scientist must first have the boyhood of poetry imagination which helps him to intuit the divine order of the universe that cannot be fully known to reason but is inferred in a leap of faith. It is clear from his letters that Kingsley himself enjoyed a childhood of imagination and that he was immersed in Romantic literature. In a letter to John Bullar, Kingsley describes his childhood reading Novalis and Jean Richter, but he concedes that now he is older he prefers to stay in the realm of science which grounds him in the real world (Kingsley 1894, 51). Although Kingsley admits that he no longer reads these authors, it is clear that he felt his early imaginative life and exposure to Romanticism protected him from empiricism in adulthood and inspired his reverence for the divine mystery of nature.

28 This is apparent from a talk Kingsley gave to the Natural Science Society in the Lake District in which he paid homage to Wordsworth. He explained to his audience that it was Wordsworth's poetry that helped him to understand the difference between the 'machinery of nature', the physical laws of the material universe, and the 'poetry of nature' that the divine ideas manifested in these laws (Kingsley 1894, 286). Kingsley exclaimed that it was Wordsworth who taught him 'how to look at and feel with Nature', and who protected him 'from those shallow cynical and materialist views of the universe, which tempt the eager student of science in his exclusive search after the material and the temporary to neglect the spiritual and eternal' (286). Kingsley urges young men of science to take a book of poetry along with their microscopes and collecting boxes as 'a spiritual corrective' to empiricism, and to keep their hearts 'healthy and childlike' with the wonder to feel God in the facts of the material world (286).

29 This explains the importance of poetry in Kingsley's fairy tale: the poems he includes by Wordsworth, Coleridge, Longfellow, and Spencer, which all centre on the divinity of nature and children, are not merely ornamental but rather represent in the novel another way of knowing that transcends logic and reason. This is also the symbolic importance of song in the fairy tale, which is juxtaposed to the conceptual nature of speech. An example of this can be seen in the song that the dame sings by Tom's grave. The narrator tells us that 'the children could not understand it, but they liked it none the less for that; for it was very sweet, and very sad; and that was enough for them' (Kingsley 1863, 81). This is because the words of the song 'are only the body of it: the soul of the song was the dear old woman's sweet face, and sweet voice, and the sweet voice, and the sweet old air to which she sang; and that, alas! one cannot put on paper' (82). The narrator compares the magical mythic song of the old woman to the new school-mistress in Vendale, calling attention to the difference between an empirical education of fact and the poetic education of imagination. Kingsley's narrator also explains to the child reader that song transcends speech when upon arriving in the mythical land of St. Brendan's Isle, Tom hears the song of a young girl, which is a mystical song of love. The narrator asks 'And what was the song which she sang?' but admits to the child reader that 'I am too old to sing that song, and you too young to understand' (186). The meaning of this song of love is ineffable yet the narrator tells the child reader that one day he will be able to sing it for himself.

30 The fairy tale symbolically expresses the divine feelings that are not fully known to reason—the transcendent ideas that the narrator can only hint at in his conversation with the child reader. This is clear from the fact that the narrator's comparison between inductive and deductive reason in the realm of logic and reason is expressed mythically in the realm of the fairy tale when Mother Carey tells Tom a story about the brothers Prometheus and Epimetheus. Prometheus, whose name means forethought, and Epimetheus, whose name means afterthought, stand for deductive reason and inductive reason respectively. In always looking forward, deductive reason seeks to confirm a hypothesis and waits for that confirmation to take place, whereas in always looking backward, inductive reason examines phenomena after the fact and in doing so revises its

premises in order to incorporate new facts. Mother Carey describes Prometheus as 'fanciful, forecasting, suspicious, prudential, theoretical, deductive, prophesying' (156) whose 'fancies [are] spun out of his own brain, as a spider spins her web out of her stomach' (157). In Mother Carey's interpretation of the myth of Pandora's box, Prometheus refuses to open the box and to learn from the experiences of the world because he is too focused on proving his own theories. Since he is so intent on looking ahead, he 'tumbled down (as most deductive philosophers do)' and is chained to the top of a mountain 'lest he should turn the whole world upside down with his prophecies and theories' (157).

31 In contrast to Prometheus's theoretical nature, Epimetheus opens Pandora's box and uses the inductive method to learn from the experience of the world that he gains. In doing so, he contributes to knowledge and improves the quality of life for humankind, which is why Epimetheus's children are the future men of science. Epimetheus also finds in the bottom of the box the hope that for Kingsley makes reverent induction possible—the hope that the processes of inductive reason will find ways to improve the ills of mankind and discover the unfolding plan of God for humankind. The hope that is necessary for reverent induction is an idea that transcends logic and reason and this is why it is symbolized mythically in the realm of the fairy tale. Indeed, this is the importance of Tom's mythical journey to find his abusive master Grimes and his discovery of St. Brendan's Isle. In her article 'Geological Katabasis: Geology and the Christian Underworld in Kingsley's *The Water-Babies*', Rachel Fountain Eames demonstrates that Tom's plight is a journey through a religious underworld, but Kingsley makes it clear that this journey is also the education of imagination that leads to reverent induction. Tom's magical journey through the mythic world of the water-babies, the 'youth of free fancy and poetry,' takes him to the 'manhood of strong and calm induction'. As one of the sons of Epimetheus, he becomes a man of science, an inventor who furthers the progress of humankind.

32 The voice of the narrator recedes during the final stages of Tom's mythical quest to find Grimes, but reasserts itself at the end of the novel to once again champion the inductive method. After holding up Bishop Butler as a paragon of inductive reason, the narrator reminds the reader that his story is not the final authority: 'if my story is not true, something better is; and if I am not quite right, still you will be, as long as you stick to hard work and cold water' (190). The narrator qualifies his story to represent how the process of inductive reason always finds new facts that will necessitate a revision of previously established laws. The narrator assures the child reader that if he or she works hard like Epimetheus/Tom and stays pure in mind and soul, he or she too can uncover new aspects of God's unfolding plan. Kingsley, however, does not end his novel here. Once again the narrator takes on the voice of deductive reason and tells the child reader to disregard what he has just said: 'But, remember always, as I told you at first, that this is all a fairy tale, and only fun and pretence; and, therefore, you are not to believe a word of it, even if it is true' (190). This abrupt change of tone mirrors the structure of the narrator's conversation with the child reader throughout the novel. This structure serves to create an ironic disjunction which prompts the child reader and indeed all of Kingsley's readers, both children and adults alike, to think critically about the theories that masquerade as self evident realities. And if the child reader misses the complexity of the narrator's argument, the fairy tale provides an education in imagination that guides the reader intuitively toward his or her own reverent induction of truth.

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Notes

1 Richard D. Beards suggests that it is this authoritarian tone that contributed to the waning popularity of *The Water-Babies* in the twentieth century (xiv).

2 Jonathan Padley offers a comprehensive overview of these criticisms of the novel (51–54).

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