# *Introduction*
## *How the child lost its tail*

> "Come away, children," said the otter in disgust, "it is not worth eating, after all. It is only a nasty eft, which nothing eats, not even those vulgar pike in the pond."
>
> "I am not an eft!" said Tom; "Efts have tails."
>
> "You are an eft," said the otter, very positively; "I see your two hands quite plain, and I know you have a tail."
>
> "I tell you I have not," said Tom. "Look here!" and he turned his pretty little self quite round; and, sure enough, he had no more tail than you.[1]

Only three years after Charles Darwin's *On the Origin of Species* (1859) brought the theory of evolution by natural selection to the British reading public, Charles Kingsley converted it into a child's tale. In *The Water-Babies: A Fairy Tale for a Land-Baby* (serialized 1862–1863), an orphaned chimney sweep named Tom falls into a river and is suddenly metamorphosed into an newtlike "water-baby." From this new animalized starting point, he must re-evolve back into a human boy, but just how bestial Tom's new body is remains ambiguous. The narrator tells us that Tom is now "3.87902 inches long, and having round the parotid region of his fauces a set of external gills (I hope you understand all the big words) just like those of a sucking eft."[2] Though Tom has the anatomical features of an eft and is not sure what other species he might be, he draws the line at the otter's assertion that he has a tail. Kingsley's narrator concurs, saying, "sure enough, he had no more tail than you."[3] Rather than resolve the issue, however, this phrasing only transforms the question about whether or not Tom has a tail into an inquiry about whether or not the implied child reader has one. Evolutionary theory provided no clear answer. Lord Monboddo, an eighteenth-century Scottish judge and philosopher, was famously convinced that all humans are born with tails and that midwives, doctors, and nurses conspiratorily clip them off after birth.[4] Less dramatically, Darwin confirmed in *The Descent of Man, and*

Figure 1 From Charles Kingsley, *The Water-Babies*, 1863, illustrated by W. Heath Robinson (Boston, MA and New York: Houghton Mifflin, 1915), Title page.

*Selection in Relation to Sex* (1871) that the human coccyx bone, "though functionless as a tail, plainly represents this part in other vertebrate animals."[5] Kingsley's illustrators came to no consensus either. In a 1915 edition of *The Water-Babies*, W. Heath Robinson offers both possibilities: on the title page, an anatomically human Tom sits astride a tailed fish [Figure 1], but following the table of contents, he is pictured as a baby merman with a back fin, webbed hands, and a tail [Figure 2].[6] *The Water-Babies*, thus, foregrounds the bizarre but intensely critical question at the intersection of Victorian evolutionary theory and child study: to what extent are children animals?

The Victorians did not invent the notion that children are closer to nature than are adults. Cicero referred to animals and children as *specula naturae*, and more recently, Jean-Jacques Rousseau linked the child and the primitive.[7] But after the incursion of evolutionary ideas into the popular imagination, the bestial conception of childhood dictated the way children were to be treated, cared for, and educated. In England and the United States, child advocates borrowed legal and moral arguments from animal protection societies; in 1885, for instance, MP Samuel Smith modeled the Liverpool Society for the Prevention of Cruelty to Children on what he had seen at the Royal Society for the Prevention of Cruelty to Animals (RSPCA) meetings.[8] By the last decade of the century, the animal child was a staple in pediatrics and child psychology. Physician Louis Robinson's

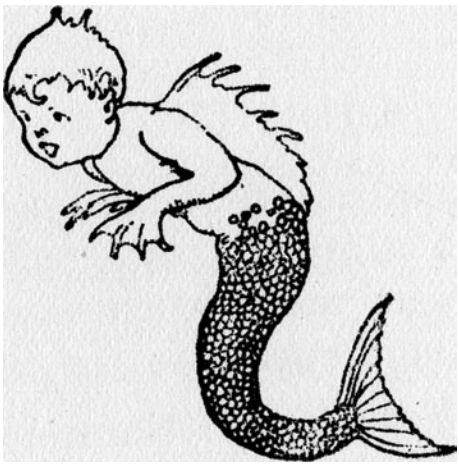

Figure 2 From Charles Kingsley, *The Water-Babies*, 1863, illustrated by W. Heath Robinson (Boston, MA and New York: Houghton Mifflin, 1915), Table of contents.

"Darwinism in the Nursery" (1891) argues that the intensity of the infant's grip, the muscularity of his arms, and his smaller lower limbs present "a striking resemblance to a well-known picture of the celebrated chimpanzee 'Sally' at the Zoological Gardens."[9] In "Babies and Monkeys" (1894), S. S. Buckman claims that "the scar which the loss of the tail has still left on children's bodies" links babies to a particular class of primates.[10] Child psychologist Milicent Shinn's *Biography of a Baby* (1900) points to the "curious resemblances between babies and monkeys, between boys and barbaric tribes" that help explain behavior as much as anatomy.[11] Likewise, James Sully's *Studies in Childhood* (1896) begins with the founding idea that for the infant "life is outward and visible, forming a part of nature's spectacle; reason and will, the noble prerogatives of humanity, are scarce discernible; sense, appetite, instinct, these animal functions seem to sum up the first year of human life."[12] Between the publication of *Origin of Species* and the beginning of the twentieth century, the association between babies and monkeys, children and animals, and boys and barbarians ceased to be a mere metaphorical formulation and became a morphological "fact" with vital psychological, moral, pedagogical, and literary consequences.

Louis Robinson, Buckman, Shinn, and Sully ground their arguments about infant and child life by extrapolating the "law of recapitulation": a corollary of evolutionary theory contending that, during gestation, the

human embryo rehearses the evolution of the species, passing through all the lower animal stages from amoeba to man. This thesis about embryological development was shared, to varying degrees, by most evolutionists in the Victorian period. In his Notebook B (1837–1838), Darwin maintains that "every step of progressive increase of organization being imitated in the womb" replicates that "which has been passed through to form that species."[13] By *Origin of Species*, he may have no longer endorsed the literal equation between individual and species – though to what extent he did is disputed – but his theory of modification counted embryological recapitulation among its foundational pieces of evidence.[14] *Descent of Man* includes sketches of dog and human embryos to show their remarkable similarity; both, by the way, have noticeable tails [Figure 3]. Herbert Spencer first applied the word "evolution," which previously referred to individual growth, to the collective adaptations of a species and in 1852 claimed that ontogenic growth suggests that phylogenic transformation is possible.[15] Just as vital to Victorian conceptions of evolution was Robert Chambers's bestseller *Vestiges of the Natural History of Creation* (1844), which employs recapitulation to show that man preserves his supreme position in nature even without special creation: if he has risen through the entirety of the animal world to arrive at its pinnacle, "man, then, considered zoologically, and without regard to the distinct character assigned to him by theology, simply takes his place as the type of all types of the animal kingdom, the true and unmistakable head of animal nature upon this earth."[16]

The scientific importance and popular appeal of recapitulation cannot be overstated. In *Ontogeny and Phylogeny* (1977), Stephen Jay Gould maintains that it "provided an argument second to none in the arsenal of evolutionists during the second half of the nineteenth century."[17] Gillian Beer's landmark work *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction* (1983) argues that "the blurring of the distinction between ontogeny – individual development – and phylogeny – species development – in the single term 'evolution' proved to be one of the most fruitful disturbances of meaning in the literature of the ensuing hundred years."[18] Subsequent intellectual histories of evolution – Dov Ospovat's *The Development of Darwin's Theory: Natural History, Natural Theology, and Natural Selection, 1838–1859* (1981), Peter J. Bowler's *Evolution: The History of an Idea* (1983), Adrian Desmond's *Archetypes and Ancestors: Palaeontology in Victorian London, 1850–1875* (1982) and *The Politics of Evolution: Morphology, Medicine, and Reform in Radical London* (1989), and Robert J. Richards's *The Meaning of Evolution: The Morphological Construction*

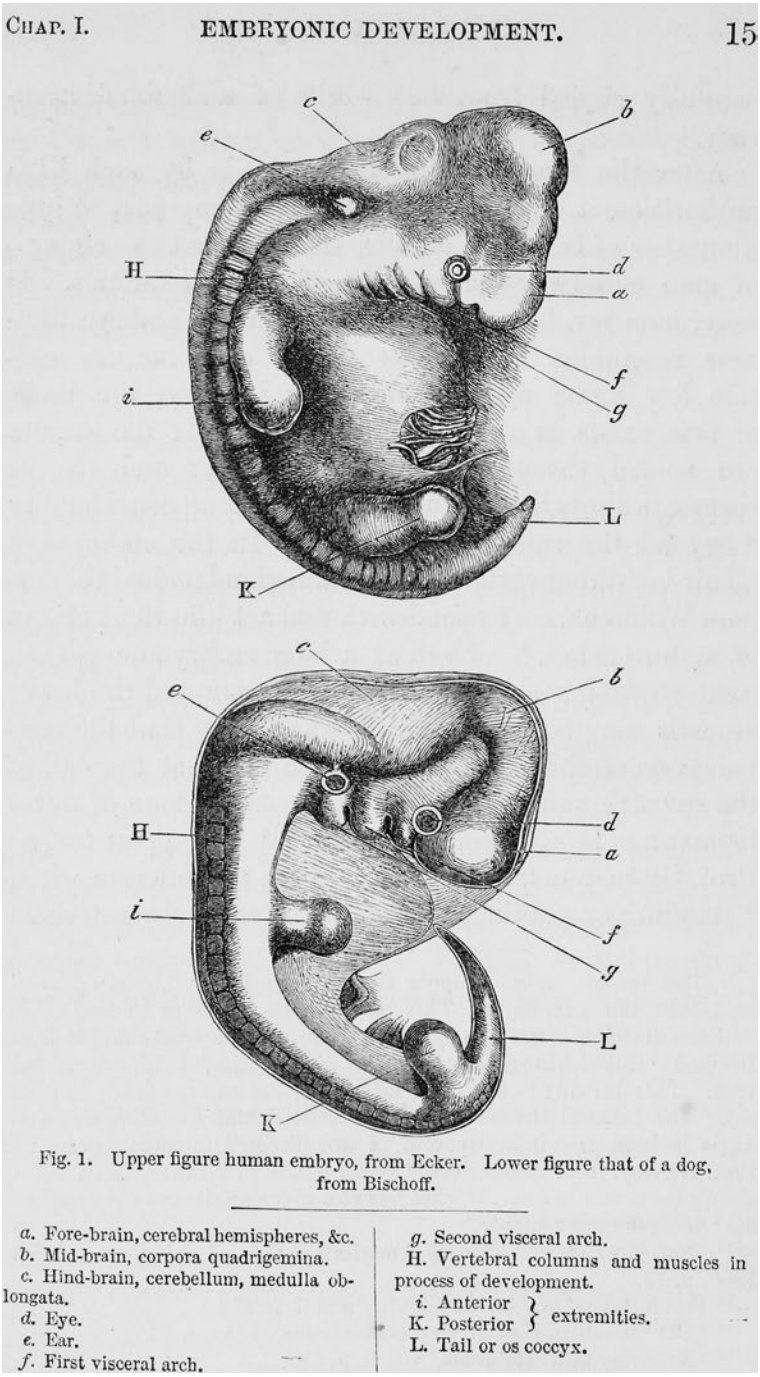


Fig. 1. Upper figure human embryo, from Ecker. Lower figure that of a dog, from Bischoff.

*a*. Fore-brain, cerebral hemispheres, &c.
*b*. Mid-brain, corpora quadrigemina.
*c*. Hind-brain, cerebellum, medulla oblongata.
*d*. Eye.
*e*. Ear.
*f*. First visceral arch.
*g*. Second visceral arch.
H. Vertebral columns and muscles in process of development.
*i*. Anterior } extremities.
K. Posterior }
L. Tail or os coccyx.

Figure 3 From Charles Darwin, *The Descent of Man, and Selection in Relation to Sex* (London: J. Murray, 1871), 15.

*and Ideological Reconstruction of Darwin's Theory* (1992) – continue to affirm the centrality of recapitulation in nineteenth-century biology.[19] Recapitulation appealed to Victorians in part because the analogy between individual and species promised solutions to the most damning disruptions and deficiencies in Darwin's theory. In *Origin of Species*, for instance, Darwin apologizes for the want of intermediate fossil forms transitioning from animal to man that obscured the proof of human evolution. But if ontogeny rehearses phylogeny, then the embryo fills in these lamentable lapses. "The phylogenic [record] is a worn and ancient volume," Shinn writes, "mutilated in many places, and often illegible," lacking "the most interesting chapter," but "a fresh copy of the whole history, from alpha to omega, is written out every time an infant is conceived, and born, and grows to manhood."[20] Perhaps recapitulation's greatest charm was less its scientific use-value than its palliative elegance. Darwinism depicted humans as an accident of random natural processes, but, as Chambers's enthusiasm attests, recapitulation reaffirmed the distinction of humanity and the teleological nature of human development.

While recapitulation assuaged some concerns about our place in the organic universe, it engendered new anxieties about childhood development. Though, in its rigorously scientific formulation, the "law" applies only to embryos, it was quickly extrapolated into a description of children. Louis Robinson claims that "an animal until independent of parental care, and even beyond that point, until the bodily structure and functions are those of an adult, is still, strictly speaking, an embryo."[21] In *The Boy Problem: A Study in Social Pedagogy* (1901), the Reverend William Forbush allows the infant a postembryonic existence, but still argues that the individual's route through the stages of the species' history extends into childhood: "the prenatal child passes up through every grade of animal life," and then "after birth this 'candidate for humanity' continues this evolution . . . by repeating the history of his own race-life from savagery unto civilization."[22] Such speculations about child development sparked new questions about the meaning of evolution applied to the individual life: Did the individual's rehearsal of the species' evolutionary history culminate with birth, or did it continue into the first five, ten, or fifteen years of the child's life? Was childhood but a way station on the road to fully realized humanity, a living relic of a still prehuman, even bestial past? If our early ancestors became human only through a series of fortuitous morphological and intellectual accidents, is the child's path to humanity likewise uncertain and indeterminate? Or if it could be controlled, what

early childhood or formalized educational experiences are necessary to secure humanity for the individual child and thus for the future of the species? Embryology may have offered to fill the gaps in human history, but reversing the formula from speculative evolutionary history back to a prescriptive narrative of individual growth generated a crisis about childhood.

Concerns about what evolution meant for childhood development were exacerbated by contemporary debates about elementary education. After the first Parliamentary grant for education in 1833, the government began inserting itself into the school system, which had been primarily controlled by the Church of England and buttressed by charitable societies like the British and Foreign School Society.[23] Demands for cheaper, nonsectarian, and mandatory education ultimately led to the passing of the Elementary Education Act in 1870, which framed a compulsory school system for children between five and thirteen years of age in England and Wales.[24] In the intervening period, from the 1830s to 1870, politicians, educators, and social activists were actively seeking a standard curriculum that could suit both the upper- and middle-class pupils already enrolled as well as the working-class children just entering the system. At the center of the conversation was the vital question: what branch of knowledge was the most valuable to the greatest number of pupils? With Dissenters and nonsectarians challenging the Church of England's stranglehold over education, religion was no longer the easy answer.[25] Instead, scientific men like Richard Dawes, John Stevens Henslow, and Henry Moseley were arguing for the moral and intellectual benefits of their own disciplines.[26] But this advocacy of scientific education received its most urgent and influential cry only once it was combined with a theory of recapitulation. The year after the publication of Darwin's *Origin of Species*, Spencer wrote an influential pedagogical treatise entitled *Education: Intellectual, Moral, and Physical* (1860), which asks, "What Knowledge Is Of Most Worth?", and answers: Science.[27] Spencer's reason for this pronouncement was recapitulation. Because the growing child is repeating the evolution of the species, Spencer insists, the child must imitate the gradual advancement of our ancestors' primitive mentation, which involved careful observation, determined experimentation, patient trial and error, and thoughtful deduction and inference. Particularly persuasive among his contemporary pedagogues was Spencer's argument that elementary education must prioritize opportunities to employ the scientific method, because it was through this distinctly scientific mode of thinking that man first raised himself above the lower animals.

Fundamental to Spencer's pedagogy is not simply an argument for increased attention to science but a complementary devaluation of literature. What our ancestors all share, according to Spencer, is their common use of the rudiments of the scientific method; even the lower animals exhibit this impulse to maneuver in and to master the elements of their physical environment. What they do not share is access to written texts. Because reading and writing were late inventions in human evolution – indeed, arising only after human societies could rest from the more pressing demands of immediate survival – Spencer claims that they have no place in early education, but rather they must be postponed to occupy only the advanced students' leisure hours. Comparing human evolution to the cultivation of a flowering plant, he makes the root and the leaves analogous to scientific knowledge, while art and literature are the flowers that blossom only at the end of the growth cycle. "The root and leaves are intrinsically of greater importance," he tells us, "because on them the evolution of the flower depends"; meanwhile, "the fine arts, *belles-lettres*, and all those things which, as we say, constitute the efflorescence of civilization, should be wholly subordinate to that knowledge and discipline in which civilization rests."[28] Spencer's analogy seems to ignore that the flower is essential to the plant's reproduction, ensuring the survival of the species rather than merely decorating the life of the individual. Nevertheless, his argument waged a crucial challenge to the pedagogical power of literature: if children were indeed recapitulating the ascent of the species, then, for Spencer, reading books – performing an act neither beast nor early homonid ever did – is irrelevant (at best) and perverting (at worst) to their proper, evolutionarily prescribed course of development.

Spencer's advancement of science as a universally essential skill-set resonated with policy makers in the decade leading up to the 1870 Elementary Education Act. But beyond the walls of the Victorian school, the so-called Golden Age of children's literature began to flourish. Many canonical children's texts reveal a surprising investment in the theory of recapitulation as well as a critical stance on the Victorian school. *The Water-Babies* invokes evolutionary theory in Tom's inability to determine whether or not he has a tail, just before launching into parodies of Victorian schoolmarms and students, crammed so full of useless facts that their brains literally burst and ooze out of them. Likewise, Lewis Carroll's *Alice's Adventures in Wonderland* (1865) subjects its heroine to morphological metamorphoses and species confusion while mocking pedagogical commonplaces like rote memorization and final exams, and Rudyard Kipling's *The Jungle Book* (1894) imagines the feral child within

a school story as Mowgli is tutored in geography, history, and comparative linguistics by a bear and a panther. The core texts of children's literature, during the genre's defining era, do not simply adopt the theory of the child's bestiality because it was in vogue. Rather, these works confront the maze of questions incited by recapitulation: about the bestial nature of the child, about the incapacity of the current school system to meet the challenge of humanizing him, and, not at all insignificantly, about the value of literature itself within the child's miniaturized evolution in which books might have no part.

Scholarly work on Victorian and Edwardian children's literature describes the genre's Golden Age as its retreat from reality into fantasy, its divestment of a previous commitment to pedagogy, its new allegiance to play, and its whole-hearted adoption of the Romantic celebration of childhood purity and innocence.[29] In *Evolution and Imagination in Victorian Children's Literature*, I argue that this all-too-accepted version of literary history is incomplete; in particular, it eclipses the genre's fascinating encounter with evolutionary science's relocation of the human – and in particular the child – as well as the genre's distinct defense of literature's role within our evolution. Though the writers examined here entertained the recapitulative theory of childhood, their works do not favor scientific education, or even realistic modes of exposition. They invent, elaborate, and celebrate their uniquely literary elements. If bestial children require humanization, these texts suggest, then it is by reading fantastical, nonsensical, parodic, atemporal, and palimpsestic books and engaging in activities and modes of thought available only within literature that they perfect their natures. Imaginative literature, thus, provides singular opportunities for the reader to evolve. Children's literature from 1860 to 1920, now taken for granted as the genre at its strongest, is in fact a wildly successful reaction to cultural pressures placing the genre at its most vulnerable. In this sixty-year period, the genre deftly pushed aside its former devotion to referentiality and verisimilitude and instead crystallized around a set of antirealist literary modes and techniques that are, I will demonstrate, its authors' ingenious transformation of a scientific construction of the child into the era's most eloquent defense of literature.

## How the child got its tail

The theory of recapitulation gained such popularity in the second half of the nineteenth century because it provided an alternative evidentiary source for evolution besides the flawed geologic record and because it

promised to restore man's preeminence in the natural world. The idea that the child repeats human evolution also appealed to the Victorians' preferences for historiography and literary genre. According to science historian Peter J. Bowler, evolutionary morphology and, in particular, recapitulation "helped to sustain the progressivist assumptions of the Victorian era, and to deflect attention away from the complexity of real life evolution."[30] Human history, understood to be moving toward ever-advancing goals, elevated Victorians as the latest, and finest, stage. In literature, the nineteenth century saw the dominance of the *Bildungsroman* – a genre that condensed narratives of national and social progress into stories about individual men and women – and, thus, it is hardly surprising that evolution was granted an individual form. The theory of recapitulation provided the nineteenth century with its most grandiose *Bildungsroman*. For recapitulation to take hold of the Victorian popular imagination, it may not have required very solid biological footing, but the controversies and conflicts that surrounded its scientific origination, as we see throughout this book, affected the ways it was adopted into other cultural arenas. The story that this study tells, then, begins with the early-nineteenth-century development of recapitulation and its influence on pedagogical practices.

Though Chambers gave recapitulation a teleological twist in the middle of the century, the first evolutionists to point out the similarities between human embryos and "lower" animals sought to explain the animal kingdom without recourse to a divine plan. At the beginning of the nineteenth century, Jean-Baptiste Lamarck's theory of transmutation challenged the divinely ordained world of natural theology. Instead of God's omnipotent hand molding each organism at Creation, the natural world now appeared to be the result of organisms' individual powers to transform themselves. Richard Owen, renowned and respected anatomist and later curator and director of London's Natural History Museum, was consistently vocal about his distaste for the tenets of Lamarckian evolution, disparaging the scheme for depending on the "self-developing energies" of organisms operating without any need for divine intervention.[31] Strangely, it was a Lamarckian eager to remove God from the picture even more definitively who offered teleology its greatest comeback by paving the way for the analogy between ontogeny and phylogeny. Étienne Geoffroy Saint-Hilaire, Lamarck's colleague at the Muséum d'Histoire Naturelle, sought to disprove George Cuvier's theory that God intermittently interceded in an ongoing creation.[32] Geoffroy instead focused on the "unity of plan," holding that the anatomical similarities among the members of a particular phylum – the bird's wing,