A brief review can do little more than hint at the contents of these volumes. Besides abundant materials on the strictly scientific work of Kelvin and Stokes, their letters provide an unusually detailed look at the inner workings of British scientific institutions during a period of profound change. They also allow us to recapture, however imperfectly, something of the lives and personalities of two remarkable men.

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Aspects of Darwin

Charles Darwin. A Biography. JOHN BOWLBY. Norton, New York, 1991. xiv, 511 pp., illus. $24.95.

Charles Darwin. The Man and His Influence. PETER J. BOWLER. Blackwell, Cambridge, MA, 1990. xii, 250 pp., illus. $21.95. Blackwell Science Biographies.

Biographies of great scientists are difficult projects. The author needs to capture both the personal life and the scientific accomplishments in a well-rounded picture, but a writer with a gift for one of these tasks may be ill-equipped for handling the other. The best solution may simply be to emphasize what one understands best and leave the other half the job to those with a taste for it. John Bowlby and Peter Bowler have both made this choice, and the books they have written complement one another effectively.

Bowlby's biography is a newsy, intimate account of private life among comfortably situated Victorians. He makes particularly good use of the recently published volumes of *The Correspondence of Charles Darwin* (Cambridge University Press). At the same time, though, he tends to slight Darwin's scientific work. He gives significant attention to the *Origin of Species* and its reception, but most of Darwin's publications get a rather quick dusting. Furthermore, Bowlby's reading in recent Darwin scholarship has been hit-or-miss. When he has put his hands on the appropriate literature, his summaries have a crisp authority; thus, he is quite good on the *Beagle* voyage and Darwin's early evolutionary thinking. However, the gaps in his reading show awkwardly when he is talking about geology or Darwin's response to critics like William Thomson (later Lord Kelvin) or Fleeming Jenkin.

Where Bowlby really excels is in his account of Darwin's personal life. A psychiatrist with a strong background in child development, he is sensitive and enlighten

Four of Darwin's children. *Left to right, from Top*, William Erasmus, born in 1839; Anne Elizabeth, born in 1841; Henrietta Emma, born in 1843; and George Howard, born in 1851. [Reproduced in *Charles Darwin: A New Life*; daguerreotypes from Darwin Museum, Down House, and (for Henrietta) Mrs. Sophie Gurney]

ing on many emotional difficulties and psychosomatic illnesses. Bowlby sees a key to Darwin's character in a somewhat overscrupulous upbringing that left him sensitive to the needs of others but tormented by the burden of his own responsibilities. Added to this difficulty was the death of his mother when he was nine years old plus the anguished determination of his father to repress all discussion of the event and all normal expressions of family grief. As a result, the mature Darwin was subject to anxiety attacks and incapacitating bouts of weakness, nausea, and depression.

Attempts to explain Darwin's illnesses as psychosomatic are not new: in recent years Ralph Colp has argued that Darwin suffered particularly from the stress of presenting his controversial evolutionary views to a hostile public. Bowlby does not ignore Darwin's anxieties about his work. However, he differs from Colp in laying greater emphasis on Darwin's concerns for close family members. For example, he explains Darwin's first lengthy period of illness in the years 1839–1841 by his distress at Emma Darwin's first two pregnancies. He notes that Darwin was completely prostrated by the death of his father in 1848 and that he suffered morbid fears about the health of his children, especially after the death of his daughter Anne in 1851. Bowlby is reluctant to assign a cause to Darwin's severe illness and depression in 1865 but notes that it may have been intensified by the gruesome suicide of the former captain of the *Beagle*, Admiral FitzRoy. A little more archival work would also have netted him evidence of Darwin's deep grief at the death of his daughter-in-law Amy Ruck in 1876.

Our knowledge of Darwin's physical and emotional health is necessarily limited and will always remain so; Bowlby may have leaned too far in favoring psychological, as opposed to somatic, explanations for Darwin's difficulties. Still, insofar as psychological explanations do apply, Bowlby makes a serious case for the importance of close personal ties in accounting for Darwin's most serious periods of illness. Darwin did require an extended period of hydrotherapy after the publication of the *Origin of Species*, but for the most part his health problems do not seem particularly work-related. Indeed, Bowlby finds that work was frequently a solace for Darwin, a helpful distraction from his griefs and anxieties about the people he loved. Yet if Bowlby is right about the limited relevance of work to Darwin's health history, the question remains just what we are to think about the connection between his inner life and the scientific theories he developed. Unfortunately, Bowlby has too weak a grasp on the science to be of much help on this question.

In contrast to Bowlby, Peter Bowler concentrates specifically on the science; in fact, Bowler gives Darwin's personal life the same slight attention that Bowlby bestows on the science. However, Bowler has mastered the recent scholarly literature on Darwin, and his account is a good introduction to modern knowledge of Darwin's life and career. Bowler is especially good on the period of Darwin's early work up to the publication of the *Origin of Species*. One of the main achievements of recent Darwin scholarship has been to bring out the ambiguity of Darwin's thinking on a number of critical issues. Darwin believed that evolution was somehow a progressive process, yet he shared with Lyell and Malthus a deep skepticism about the idea of progress and employed it only cautiously in his work. Darwin was proud of his own idea of natural selection, yet he never abandoned the concept of use-inheritance. Perhaps under the influence of his *Beagle* collections, he first adopted the concept of geographic speciation, but in the 1850s he shifted to an ecological interpretation of speciation—without ever quite ruling out the importance of geographic distribution. Shortly after his return from the *Beagle* voyage, Darwin gave up the Christianity of his early life, and over the years he gradually drifted

toward agnosticism. Yet toward the end of his life he confessed that his thoughts about religion were a muddle.

Despite (or perhaps because of) this persistent indecision, Darwin inched his way toward the triumph of his mature evolutionary insights, and Bowler's account of the process is superb. At this point, however, Bowler's synthesis begins to harden: he views the first edition of the *Origin of Species* as the pinnacle of Darwin's achievement and most of Darwin's subsequent modifications of its message as unfortunate regressions from the ideal. He does not adequately recognize the extent to which the *Origin* was a stopgap publication (Darwin thought of it as an abstract) intended to lead up to other things. Among those other things were a theory of pangenesis specifically designed to justify Darwin's belief in use-inheritance and a theory of human emotional expression based almost entirely on that belief. Bowler himself repudiates the old idea that Darwin's compromises with use-inheritance in the fifth and sixth editions of the *Origin* were designed to accommodate criticism from Kelvin and Jenkin; yet he fails to acknowledge the extent to which those compromises simply brought the *Origin* closer into line with positions Darwin was developing in other important books. The great virtue of Bowler's account is his recognition that Darwinism was not simply a matter of belief in natural selection as such, but above all a belief in the contingent, open-ended character of the evolutionary process. Darwin may have been indecisive on the relative importance of selection and use-inheritance, but he was absolutely firm in excluding all forms of directed or orthogenetic evolution. Bowler observes that field naturalists who shared Darwin's interests in environmental adaptations tended to be the most loyal Darwinists whereas investigators like Ernst Haeckel and Thomas Huxley who had a strong interest in morphology tended toward a kind of pseudo-Darwinism that neglected selection and evolutionary contingency. He somewhat exaggerates the differences between these morphologists and Darwin—both Haeckel and Huxley did take evolutionary contingency seriously—but the point is still a sound one.

Bowler is alert to the social and intellectual context of Darwin's work, and he frankly observes that Darwin was, yes, a social Darwinist. Darwin's very real aspirations for a kinder, gentler world were counterbalanced by a strong pessimism about the biological capacities of the human species. As Bowlby points out, this pessimism extended even to his children, who he feared had inherited his own delicate constitution. Unfortunately, this observation is one of the few in either book that helps tie Darwin's inner personal life to his public and scientific concerns. That biography is still unwritten, but Bowlby and Bowler offer us plenty to think about in the meantime.

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Tales Retold

Narratives of Human Evolution. MISIA LANDAU. Yale University Press, New Haven, CT, 1991. xvi, 202 pp., illus. $22.50.

In *Narratives of Human Evolution*, Misia Landau summarizes the views on human evolution of T. H. Huxley, Ernst Haeckel, and Charles Darwin in the 19th century and of Arthur Keith and Grafton Elliot Smith in the early 20th century, concluding with very brief descriptions of the more recent conclusions of Raymond Dart, J. T. Robinson, Philip Tobias, Donald Johanson, and Tim White. One of her messages is that phylogenetic reconstructions of fossil and recent hominids provided by each of these workers were strongly influenced by their beliefs about the mechanisms producing this change. None too surprisingly, Darwin thought that natural selection was the primary motor of evolutionary change in all species, including our own.

Although Huxley is thought of as the paradigm Darwinian, he disagreed with Darwin about the fundamental character of the evolutionary process and contributed very little of substance to the development of evolutionary theory itself. In his *Man's Place in Nature* (1863) he was primarily concerned to argue that the human species did evolve from ancestral primates, not to consider the mechanisms involved. Nor does Haeckel make much use of natural selection in his *History of Creation* (1868). He gives much more space to his own principle of recapitulation. The non-Darwinian tradition was continued by Keith and Elliot Smith. Although both men opposed neo-Lamarckism, their orthogenetic views departed just as markedly from Darwin. Not until the Modern Synthesis in the 1940s did a more genuinely Darwinian version of the evolutionary process actually influence paleoanthropologists.

The explicit points of contention among these paleoanthropologists concerned primarily which species were ancestral to us and the order in which key adaptations evolved. Although both Keith and Elliot Smith accepted Piltdown man as genuine, they interpreted this skull and jaw differently, and neither thought that this extinct species was among our ancestors. Keith opted for bipedalism as leading the way in human evolution, whereas Elliot Smith opted for the brain. As Landau remarks, Elliot Smith emphasized the brain so much in his work that one would hardly think that our ancestors even had bodies.

Among the more recent paleoanthropologists whom Landau discusses, debates continue over which fossils represent genuinely distinct species and, of these, which are direct ancestors to present-day humans. Although work in paleoanthropology after the Modern Synthesis is supposed to be influenced by a more Darwinian conception of the evolutionary process, the disagreements that Landau chronicles are decidedly non-Darwinian. They concern such issues as whether or not the morphological gap between *Australopithecus africanus* and *Homo erectus* is bigger than the gap between either of these two putative species and some other putative species, such as *Homo habilis*. Reconstructing phylogeny on the Darwinian paradigm involves much more than questions of morphological gaps.

Landau's discussions of controversies in paleoanthropology such as the preceding are both informed and lucid. However, she is not primarily concerned to chronicle the history of the field or even to indicate the effect that changing views about the evolutionary process had on phylogenetic reconstruction. Instead, she wants to warn those scientists who are engaged in reconstructing evolutionary history that they have been duped. They think that their historical narratives are influenced primarily by the interplay between theory and data that characterizes the rest of science. Instead, she argues, these paleoanthropological narratives "approximate the structure of a hero folk tale, along the lines proposed by Vladimir Propp in his classic *Morphology of the Folktale* (1928)" (p. x). Her working assumption is that "theories of human evolution [phylogeny] are determined by an a priori set of functions rather than an available set of fossils" (p. 14). By showing paleoanthropologists that they have been constrained by the rules of art, not science, Landau hopes to free them from this unnoticed bias. She wants to encourage her fellow workers to wrestle with the "story-telling dragon" instead of ignoring it.

The stages of the archetypical hero tale begin with the hero leading a relatively safe and untroubled life. After the hero is introduced, a change in circumstance occurs that leads the hero to depart on a journey during which he is sorely tested. Somewhere along the line, a donor appears who helps transform the hero. The hero is then tested again