Darwin Novelized

The Origin. A Biographical Novel of Charles Darwin. IRVING STONE. Jean Stone, Ed. Doubleday, Garden City, N.Y., 1980. 744 pp. $14.95.

Irving Stone's previous titles evoke the dramatic personalities of his former subjects: Michelangelo struggles to come to terms with his homosexuality in *The Agony and the Ecstasy*; Van Gogh suffers the burden of mental illness in *Lust for Life*. Charles Darwin, by contrast, poses a severe challenge for a biographical novelist. Darwin encountered drama enough on the *Beagle*, but his revolutionary theories, though they rocked an entire world, did not produce an outward personality in any sense "larger than life." Darwin's ideas tortured and obsessed him, but they provoked ill health and a life of retching and flatulence as their external expression, rather than romantic Wanderlust or irresponsible, destructive drive.

After the circumnavigation of his youth, Darwin never again left the United Kingdom. In later years, he rarely left the seclusion of his country estate, except for an occasional trip to London or to some hydropathic establishment or other in a vain search for relief from illness. Darwin rarely said an unkind word to anyone. He had a devoted wife, loving and successful children, a comfortable estate. His life passed without a breath of scandal, not even a recorded hint of what his century would have called a sexual misadventure. The intense drama of Darwin's story lies in another plane—and a hard one for a novelist to reach. It is best epitomized by the line from Emerson that Huxley (in Stone's book) wished to use for Darwin's epitaph: "Beware when the great God lets loose a thinker on this planet."

Stone's success with such a recalcitrant subject is a testimony to the power of an art that he has promoted assiduously for many years. His books are, technically, novels, but their aim is to convey truth as it might have been. Stone begins by setting down all the facts of a subject's life that might be useful. He then immerses himself in the minutiae of social history and mores of the time. All this requires more hard research than many academics devote to their technical studies, and I have been unable to understand (except as unwarranted parochialism or jealousy) why so many colleagues (usually without reading the book) dismiss Stone's reconstruction because it entered the *New York Times* list of best-sellers on the fiction side. Every word of *The Origin* is constrained by the list of facts. Whenever possible, Stone weaves his tale from the list itself, taking no more poetic license than putting the words of a letter into someone's oral discourse. When he must invent for lack of a record, his statements and incidents are scrupulously plausible. The paths to insight are many, and we must pursue them in mutual respect, according to our several skills. *Quot homines, tot sententiae*.

In fact, one has to be something of a Darwin aficionado to appreciate the immense labor invested in this book—to recognize how many of its voluminous and tiny details are facts of Darwin's life. Stone's tapestry is often so seamless that even the most pedantic of literal items flows as though it were an invention purposely constructed for smooth transition.

Stone's method suggests a parlor game for the initiated; identify your favorite Darwinian facts and passages beforehand, and tick off Stone's creative utilization as you go. I chose three, all originally from letters, once I cottoned on to Stone's procedure: First, the famous statement to Fawcett, "How odd it is that anyone should not see that all observation must be for or against some view if it is to be of any service" (Darwin pronounces it, Hamlet-like, in a soliloquy just before Wallace's independent discovery of natural selection arrives in a letter.) Second, Huxley's call to battle: "I am sharpening up my claws and beak in readiness." (He states it orally to Darwin over a glass of champagne in celebration of the *Origin*'s publication.) Third, Darwin's modest remark that half his work came out of Lyell's brain. (Darwin says it directly to Lyell in a stilted bit of dialogue that only underlines the enormous difference between spoken and written English.) If Stone's technique contains a fault, it resides in unrealistic dialogue produced by putting written texts into a man's mouth. In this case, Lyell himself is discomforted by the fulsome flattery and remarks (in "real" dialogue marking Stone's invention): "Be very careful, my dear Darwin, or one day . . . some young scientist is going to throw that charming compliment right back in your teeth."

Others may object to the sheer length arising from Stone's decision to fit in every one of those 10,000 facts—731 pages of text. I can only say that I enjoyed it all, but then I also love Wagner and Victorian novels, and am, by good fortune, liberally endowed with what my grandmother used to call *Sitzfleisch*. To cite Terence's line again: there are as many minds as there are men.

Yet, despite all this good cheer for methods and meticulousness, I strongly question Stone's account of the most crucial aspect of Darwin's life for any scientist—intellectual history and the meaning and impact of evolution. Stone spent much time lovingly and laboriously getting every detail right—the dimensions of all additions to Darwin's house, the names and skills of his servants, the latest fashions in dress and entertainment, and, above all, the minutiae of Darwin's carefully kept accounts (though I did receive a momentary shock when Stone cited Darwin's income tax as 7 shillings to the pound—a full 35 percent—until I realized, from the cited total, that he meant pence, or not quite 3 percent). Yet when he comes to the essentials—the history of ideas and theories—he accepts and propagates the oldest chestnuts about objectivity and *the* scientific method.

Stone makes Darwin live as an individual but constructs him of cardboard as a thinker. He paints Darwin as the leader of an embattled quadrivium of unprejudiced observers—Lyell, Huxley, Hooker, and himself. Their opponents are habit, religion, and bigotry; they are the "real" scientists who see nature face to face and thereby glimpse truth. Stone thus abstracts Darwin from his times in explaining the genius that makes him such a compelling subject today. Yet he propagates this historical myth after succeeding so admirably in reconstructing Darwin's age for the details! Something is almost perversely backwards here.

Darwin and his confrères were no less embedded in this society, and influenced by it in forming their scientific beliefs, than the catastrophists and creationists. Their genius did not lie in abstraction from their times, but in their creative and unconventional use of contemporary ideas. Lyell was not, though Stone so depicts him, primarily a great objectivist

battling benighted theological catastrophists whose allegiance to Genesis did not permit an ancient earth. That battle had been won, in part by catastrophists who read the geological record literally and envisioned a long history, infrequently punctuated by major upheavals recorded directly in strata. Lyell's gradualism was an inference based on a (correct) belief in the imperfections of the geological record. It did not arise as a direct and superior observation of strata, and it was as much a product of social preferences for stately change as a conclusion forced by fossils and ancient environments.

Darwin's formulation of natural selection, a transfer of Adam Smith's laissez-faire economics into nature, arose from his immersion in the literature, philosophy, sociology, and economics of the 1830's, not only from a pure vision of finches and tortoises. Yet Stone cannot handle this in his mythology and must paint Darwin's reading of Malthus as a glorious and catalytic accident, rather than as the directed, albeit groping, culmination of an explicit search for an evolutionary mechanism. Stone thereby brushes past the single most important incident in Darwin's intellectual life with a paragraph or two. What else can one say about disembodied serendipity? Pages for subsidiary details, and barely a passage for the greatest event in the history of biology!

Stone also simplifies to the point of misrepresentation the issues swirling about the publication of the *Origin of Species* in 1859. He conflates Darwin's defense of the fact of evolution with his justification for the theory of natural selection as its mechanism—a distinction Darwin always drew with great care because he realized both the weaknesses of his theory and the incontrovertibility of evolution as a fact. (He wrote, for example, in the *Descent of Man*: "I had two distinct objects in view; firstly to show that species had not been separately created, and secondly, that natural selection has been the chief agent of change.") Since Stone equates natural selection with evolution and depicts all opposition to evolution as lingering Bibliolatry, he cannot properly describe the legitimate scientific arguments that swirled about the concept of natural selection, even within Darwin's own circle. He ascribes Hooker and Lyell's reticence to religion (not entirely incorrectly, of course) and bypasses their cogent doubts (in the absence of an adequate theory of heredity) about the creativity of natural selection. (Lyell wrote in his journal that he could equate natural selection with just two members of the "Hindoo triad"—with Siva the destroyer and Vishnu the preserver, but not with Brahma the creator.) Stone doesn't recognize Huxley's opposition at all, though Huxley was a saltationist who objected strongly to Darwin's conflation of natural selection with gradualism. (Stone reproduces Huxley's famous comment only partially: "As for your doctrine, I am prepared to go to the stake for it." Huxley actually wrote, in a letter to Darwin containing his first comments on the *Origin*: "I am prepared to go to the stake, if requisite, in support of chapter 9, and most parts of chapters 10, 11, 12." For the rest, Huxley gives his criticism: "You have loaded yourself with an unnecessary difficulty in adopting *Natura non facit saltum* [nature does not make leaps] so unreservedly.")

Science is the most dialectical of human endeavors. Embedded in culture, it possesses unparalleled power to alter the very systems that nurture it. Stone catches this ambivalence when Lyell urges a reluctant Darwin to admit his error and acknowledge Agassiz's glacial theory for the origin of some Scottish topography. Darwin, pained but acknowledging the inevitable, is saved from further remonstration by a summons to tea. He remarks: "That's an area where people can make no mistakes. High tea. With thin sandwiches of tomato, watercress and cucumber, hot scones buttered inside and served with strawberry jam."

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Hales's Activities

Stephen Hales. Scientist and Philanthropist. D. G. C. ALLAN and R. E. SCHOFIELD. Scolar Press, London, 1980 (U.S. distributor, Biblio Distribution Centre, Totowa, N.J.). xii, 220 pp. $50.

Stephen Hales (1677–1761) was probably the most important English scientist of the 18th century. In two major works entitled *Vegetable Staticks* and *Haemastaticks*, published in 1727 and 1733 respectively, he made a number of significant contributions to plant and animal physiology, and also, through his study of the production or absorption of "air" in chemical reactions, to chemistry. The importance of his work was widely recognized in his own day, and in addition to being a fellow of the Royal Society of London he was in 1753 accorded the distinction of being elected one of the eight *associés étrangers* permitted under the statutes of the Royal Academy of Sciences in Paris.

The titles of Hales's books reflect the distinctive approach he adopted in his scientific investigations. This so-called "statical way of inquiry" focused on the fluids flowing in plants and animals and led Hales to make quantitative measurements of such "mechanical" factors as volume, pressure, and rate of flow. His measurements on plants led him to deny the then commonly held opinion that sap circulated through plants in a manner analogous to the circulation of blood in animals. He observed the variation in sap pressure during the day and noted that the pressure increased when his plants were exposed to the sun. Eventually Hales reached a full understanding of the role of "perspiration" in causing the sap to rise, and in a brilliant series of experiments he successfully determined the rate of loss of water through the leaves of a large sunflower. He also realized that transpiration alone could not account for the remarkable rise of sap in his vines during the "bleeding season," and this led him to the discovery of root pressure as an important additional factor in the process.

Hales acquired considerable notoriety for his experiments on living animals, experiments that seemed entirely out of keeping both with his position as "perpetual curate" in the quiet Thames-side village of Teddington and with his own innocent and simple character. In the best known of these experiments he measured the blood pressure in a live mare directly by tapping one of the animal's femoral arteries and observing how high the blood would rise in an attached vertical tube. In another experiment he made a wax cast of the left ventricle of an animal in order to determine the internal volume of the chamber and thus (after multiplying by the pulse rate) the cardiac output. He also made an extensive study of the flow of blood through the capillaries, eventually concluding that its force was far too small to account for muscular action in the way some physiologists had supposed.

Hales's scientific influence was most strongly felt, however, in chemistry. Prior to his work it was generally agreed that air did not participate in chemical reactions but merely acted as a solvent and carrier for various "steams" and other, grosser active reagents. In a long chapter in *Vegetable Staticks*, Hales presented many experimental proofs that air could be "fixed" in some processes and regain its elasticity in others—that is, that it