Book Reviews

Facts Bearing on Darwin's Illness

To Be an Invalid. The Illness of Charles Darwin. RALPH COLP, JR. University of Chicago Press, Chicago, 1977. xiv, 286 pp. + plates. Until 1 July, $15; thereafter, $17.50.

Charles Darwin was chronically ill for most of the period between his return from the voyage of the *Beagle* in 1836 and his death in 1882, with some respite during the last ten years of his life. References to his ill health abound in his correspondence and personal papers and in the reminiscences of those who knew him, including his wife and children. Darwin's concern over his health often dominated even his intense desire to further his geological and biological research. Naturally Darwin scholars are keenly interested in the origin of the symptoms that kept their hero from his research.

Vomiting was Darwin's primary complaint. Other symptoms included uncomfortable palpitations of the heart, eczema, boils, and ones that Darwin variously described as "hysterical crying," "trembling," "shivering," "swimming head," and "dying sensations."

The dramatic illness of this great man has attracted the interest of many historically minded physicians. Explaining Darwin's illness has the same basic appeal as, for instance, attributing the fall of the Roman Empire to poisoning from lead water pipes. But, like that explanation, the many explanations offered by physicians for Darwin's illness have been simplistic and unsatisfying.

Ralph Colp's book is therefore especially welcome. He has meticulously researched unpublished Darwin materials and, in the first part of his book, presents a comprehensive, detailed description of Darwin's illnesses year by year, month by month, and sometimes day by day. Many fascinating details emerge. Darwin genuinely believed in the efficacy of hydropathy (the water cure) for alleviating his symptoms, and spoke highly of the cure even after he had abandoned its use. For five and a half years he kept a "Diary of Health" recording symptoms, treatments, and results. He vomited daily for many months between 1863 and 1865, but his appetite remained strong and he did not lose weight.

Recitation of the details of Darwin's illness unfortunately becomes tedious. His major symptoms were recurrent. Darwin's assessment of his illness late in his life appears quite accurate; each new treatment would help for a while, then its beneficial effects would disappear. Thus the medical details of Darwin's illness become a relatively monotonous series of ups and downs. In addition to these details, the first part of the book recounts the development of Darwin's hereditarian attitude about his illness, his views on doctors and the efficacy of their treatments, and his reliance on his father and wife. The whole account is richly documented, with a very nice set of illustrations.

Colp devotes the second part of his book to an analysis of the theories that others, mostly physicians, have proposed to explain the origins of Darwin's illness. Having presented the description of Darwin's symptoms in unprecedented detail, Colp has a firm foundation for this analysis. He effectively criticizes every major and minor theory of Darwin's illness, including those postulating heredity, "suppressed gout," seasickness on the *Beagle*, simple psychosis, Chagas' disease, arsenic poisoning, and allergy to pigeons. He demonstrates conclusively that none of these suspected causes can adequately account for Darwin's complex symptomology. With good reason, Colp argues that, to be certain about the actual causes of Darwin's illness, a physician would have to perform a series of laboratory examinations that were unavailable in Darwin's time. Colp cautiously concludes that "at present, the best that can be done is to evaluate which cause—among many possible causes—best accords with the known facts" (p. 142).

Colp then advances his own theory of the cause of Darwin's illness. Because Darwin's stomach, heart, skin, and cerebral symptoms were unspecific and cannot be tied with any certainty to known physical diseases, Colp concludes that psychological states probably caused most of them. This is a plausible hypothesis, but certainly unproved. This hypothesis leads to Colp's major thesis, that the theory of evolution by natural selection aroused in Darwin such intense anxieties that physical symptoms ensued. Darwin's theory was so novel, so much against the dominant views of the time, that Darwin feared ridicule and persecution and in response became sick.

The year September 1837 to August 1838 was the first extended period of Darwin's illness. During almost this same time he began work on evolutionary theory and the idea of natural selection, and extended his ideas to man. Colp concludes that the psychic stress of work on evolution, which Darwin kept secret, initiated his chronic illness at this time. Colp's general argument is that the stresses of his unorthodox thought on evolution continued to be a major cause of his illness until he ceased to write books on evolution and devoted his attention to plants and worms.

Colp's thesis sounds plausible. We know that Darwin believed his ideas were revolutionary. Doesn't it seem reasonable that he should have suffered psychic stress for dreaming up such ideas? But Colp's thesis cannot bear scrutiny in the light of the very data he presents. To begin with, Darwin was not very sick during the year 1837–38. Moreover, his primary occupation was with writing up the geological results of the voyage of the *Beagle* and worrying with the publication of his already written *Journal of Research*. Work on "species" occupied only a small percentage of his working time. Colp presents no convincing evidence that the species work rather than the geological work made Darwin ill. Darwin's illness worsened considerably during the ensuing period 1839–42, and almost the whole of his working time during these three years was devoted to his book on the formation of coral reefs. Immediately upon finishing the book, in May 1842, Darwin felt much better, and during the next two months he quickly wrote out the "Sketch of 1842" on evolution and natural selection. The attribution of Darwin's illness during 1839–42 to "repercussions from his theory of natural selection" seems improbable, given the facts presented by Colp. Indeed, Colp quotes Darwin as later remembering that during this time he could work on "facts bearing on the origin of species . . . when I could do nothing else from illness," which indicates that the work on species was less distressing than his geological researches.

Colp presents no evidence that Darwin was particularly ill when he wrote out the much longer "Essay of 1844." Nor did Darwin suffer terribly during the years 1856–58 when working on his large manuscript on evolution by natural selection. When Alfred Russel Wallace ap-

peared to scoop his ideas in June 1858, Darwin's illness was not exacerbated, as Colp notes. Even when he was writing the *Origin of Species*, his illness was much less severe than it was in the late 1840's when his father died and he was working on barnacles, or in 1863–65 when he was working on *The Variation of Animals and Plants under Domestication*. During the period 1866 to 1872 he finished and published not only three extensively rewritten editions of the *Origin* but also three other books related to it: *The Variation of Animals and Plants* (1868), *The Descent of Man* (1871), and *The Expression of the Emotions in Man and Animals* (1872). Only once during these four years did severe illness interrupt his daily work schedule.

Colp argues that during the last decade of his life Darwin's health improved because he "gave up writing on theoretical and controversial issues" and steered clear of the idea of natural selection. I would argue that books such as *Insectivorous Plants* (1875) or *Effects of Cross and Self Fertilization of Plants* (1876) were actually deeply related to Darwin's idea of evolution by natural selection. But they did not seem to make Darwin sick.

In short, Colp's major thesis is appealing but has little basis in the evidence he has meticulously compiled. The evidence indicates that the idea of evolution by natural selection made Darwin no sicker than his father's death or working on the formation of coral reefs or the taxonomy of barnacles.

If Colp's thesis fails, his book surely does not. It unquestionably is the definitive account of Darwin's illness in all its manifestations, and it provides an instructive case study of medical practice and attitudes toward medicine in Victorian England.

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Innovation in the 19th Century

Harpers Ferry Armory and the New Technology. The Challenge of Change. MERRITT ROE SMITH. Cornell University Press, Ithaca, N.Y., 1977. 364 pp., illus. $17.50.

This important book challenges a number of long-held beliefs about the mechanization of American industry. Many of us have assumed that all American workmen eagerly adopted labor-saving machinery and that the resulting mechanized production was much less costly than labor-intensive production. Not so, says Smith, who cites the continued resistance at Harpers Ferry Armory to machines already in use at the armory in Springfield, Massachusetts, and shows that for 35 years the labor-intensive methods at Harpers Ferry were competitive with the mechanized production system at the Springfield Armory.

Economic historians have assumed that the mass production of clocks and guns always entailed interchangeable parts, and that this was the feature of the system that led to cost savings. Not so, says Smith. The notion of interchangeable parts was an engineering ideal, prohibitively expensive for anything except army muskets and rifles. Only the federal customer could afford to insist that the ideal be attained.

The thread that holds the book together is a narrative of the Harpers Ferry Armory between its founding in 1798 and its destruction in 1861, but Smith deals also with the larger issues of industrialization and mechanization. He would have us see that our focus has been too narrow and that our conclusions regarding American manufacturing methods have been colored by our unexamined assumptions. Furthermore, he reminds us that we have overlooked almost totally the relationships between agencies of social control—schools, churches, business and civic groups—and industrial progress.

The armory was located at Harpers Ferry because President George Washington wanted it there. When a War Department report in 1795 failed to mention Harpers Ferry as a viable site for an armory, Washington had the report rewritten to conform to his wishes. Harpers Ferry was to be the "Mother Arsenal," larger and more important than the already operating Springfield Armory or the other proposed armory in North Carolina.

Harpers Ferry Armory was not unimportant, despite the fact that Smith is the first scholar to study it carefully. The famous gun-stock shaping machine of Thomas Blanchard was first erected there, and in the 1820's John Hall's rifle shops, located in Harpers Ferry and sharing government funds with the armory proper, produced the first fully interchangeable guns to be made in America.

Yet its important contributions were not typical of its normal performance. Both Blanchard and Hall were New Englanders who were sent there by the War Department. James Stubblefield, a well-connected Virginian who was superintendent for 22 years, set a pattern of resistance to change and quiet disregard of prodding by the War Department to adopt machines and processes already in use at Springfield. Through a network of relatives and influential friends, Stubblefield effectively controlled the town and region of Harpers Ferry, supporting the expectations of his gunsmiths that change would not be permitted in armory operations and effectively excluding both new people and new ideas by economic and social pressures on strangers and dissidents.

In the main, Smith is convincing. At any rate he raises objections to standard interpretations that cannot be lightly dismissed. Scholars who deal with American manufacturing in the 19th century will have to take Smith's conclusions and admonitions into account.

On the other hand, I wonder if the reluctance of craftsmen to adopt new methods was not due as much to an unprogressive superintendent as to their own conservatism. John Hall was able to find workmen in Harpers Ferry who would build the precise and elaborate machines he required for his highly mechanized rifle works. His workmen must have known that Hall intended to use unskilled operators (boys, actually) to run the machines they were building for him. The enthusiasm of an innovative supervisor apparently overcame scruples against replacing skilled gunsmiths.

Smith's observation that few historians have considered the relationships between agencies of social control and technological progress comes near the end of the book. His concern with social control appears to have grown out of his study rather than to have been a part of this initial program of inquiry; but it is nonetheless important. The idea is provocative and the need to pursue it is evident. As we seek the roots of technological change, we must be conversant with the technology itself, as Smith is, and we must also recognize that acceptance of new technology is somehow connected with social conditioning, which in turn requires schools and churches and civic organizations that promulgate and reinforce the notions of diligence, efficiency, and progress.

This book was recently awarded the prestigious Frederick Jackson Turner award of the Organization of American Historians, placing first in a field of 24 entries, one entry only being accepted from each university press. Historians of technology who have been trying to interest general historians in their field