

Bicentennial Bookshelf. Shine and Wrobel were generously aided by Allen and others in their research, and they conducted a number of interviews with Morgan's onetime associates. Their volume is not as deep or analytic as Allen's in dealing with Morgan's science, but its account of his research is generally reliable in spite of some historical inaccuracies. The authors' bluegrass perspective brings out a good deal of information about the Morgan family background and social relationships. Skillful in their use of anecdote and narrative, Shine and Wrobel also frequently accomplish a vivid portrait of the man and his scientific setting. Unlike Allen, they show us Morgan at work, carefully observing, then squashing *Drosophila* in the malodorous fly room, with its rotting bananas and scurrying cockroaches. Gracefully and absorbingly written, the Shine and Wrobel volume provides a helpful, if slight, complement to Allen's forceful treatment.

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## Memoirs of an Apostate

**Heraclitean Fire.** Sketches from a Life before Nature. ERWIN CHARGAFF. Rockefeller University Press, New York, 1978. viii, 252 pp. \$13.

Erwin Chargaff is one of the most interesting scientists of the present century and for the most ironic of reasons: for his discoveries of the variation and regularity in DNA composition, he is entitled to a central place in the history of molecular biology, and yet he has become an alien and embittered figure hating his very field. Where others see in the double helix a symbol of progress, Chargaff sees all that is wrong with what he calls "our bestial century."

What has made of Chargaff this stranger in our midst? This memoir offers many clues. We learn that Chargaff's alienation is of long standing. A lover of the arts and literature, reared in the rich cultural ambience of Vienna in the '20's, Chargaff appears to have chosen chemistry as a career for no more profound reason than that it was a dependable livelihood for a man of intelligence and provided a means for him to enjoy the fruits of culture. Obligated to emigrate because of the Nazi terror and leaving behind a

mother who was to disappear in the Holocaust, Chargaff remained ever after an uprooted alien unassimilable to the crass, commercial, often insensitive America in which he found asylum.

But this is not the only strain we perceive in Chargaff's autobiographical sketches. We detect the plaintive tone of a man who feels unappreciated, even rejected. Chargaff notes somewhat bitterly that no other university ever saw fit to lure him away from Columbia, where he received his first faculty appointment. Chargaff is bitter, too, about the seeming haste with which Columbia moved him out of his laboratory following retirement. But the key passages have to do, of course, with the discovery of the double helical structure of DNA. Watson, in his version of the famous visit Chargaff paid Watson and Crick in May 1952, recalls a cynical, somewhat contemptuous visitor unimpressed by the virtues of model-building. Chargaff, for his part, remembers an aggressive pair of boorish "hucksters" and "pitchmen," pumping him for all he knew (which was a great deal) and eager to fit it all into a preconceived helical structure despite an appalling ignorance of basic chemistry. Indeed, Chargaff believes that "the double-stranded model of DNA came about as a consequence of our conversation" (p. 102) and complains that in their initial paper Watson and Crick failed to acknowledge either his help or his crucially relevant reviews of 1950 and 1951. As a parting shot, Chargaff informs us that, even if he had been so fortunate as to come up with the idea of the double helix as an explanation for his own findings and the x-ray diffraction data of Rosalind Franklin, he would never have "elevated the double helix into 'the mighty symbol that has replaced the cross as the signature of the biological alphabet'" (p. 103).

We have in that reflection of Chargaff's the heart of his resentment against modern science as typified by molecular biology, which he sees as having been engulfed by an "orgy of exaggeration and empty promise" (p. 5) and as having given rise to "obnoxious dogmas" (p. 106). Chargaff's own inclination, he tells us, "has always been more to marvel at a mystery than to explain it to the onlookers" (p. 98), and his ideal scientist is one who, engaged in "orderly, loving, and careful study" (p. 107), is "conscious of the perpetual darkness that must surround him as he probes nature" (p. 123). Chargaff also inveighs more than once against the current bigness of science. He longs for "conditions in

which one man, perhaps together with two or three younger ones, can pursue his search in a quiet and dignified manner" and hopes for the day when "'scientific breakthroughs' and 'centers of excellence,' 'interdisciplinary team research' and 'peer review' will be memories of an ugly past'" (pp. 122-123).

Chargaff does not take up the practical question of how present-day science could be diverted from the course he deplores. Perhaps as enchanted with despair as the "entrepreneurs" he sees around him are with hope, he is content with a literary rendering of the plight of the outcast in a scientific world of dogmatic imperialism and with apocalyptic visions of the end of that world. Chargaff's writings remind us that there are many different personalities in science and that we probably need all of them. We need Chargaff for his critique of science, although we will need the continued thought of others to deal with the problems he sets out so dramatically.

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## Darwin and Philosophers

**The Young Darwin and His Cultural Circle.** A Study of the Influences Which Helped Shape the Language and Logic of the First Drafts of the Theory of Natural Selection. EDWARD MANIER. Reidel, Dordrecht, 1978 (U.S. distributor, Kluwer Boston, Hingham, Mass.). xii, 242 pp., illus. Cloth, \$24.50; paper, \$11.95. Studies in the History of Modern Science, vol. 2.

John Fowles's novel *The French Lieutenant's Woman* contains a passage appropriate to discussion of *The Young Darwin and His Cultural Circle*:

The fact that every Victorian had two minds . . . is the one piece of equipment we must always take with us on our travels back to the nineteenth century. It is a schizophrenia seen at its clearest, its most notorious, in the poets . . . Tennyson, Clough, Arnold, Hardy; . . . in the ubiquitous neuroses and psychosomatic illnesses of intellectuals otherwise as different as Charles Kingsley and Darwin; . . . transparent also in the mania for editing and revising, so that if we want to know the real Mill or the real Hardy we can learn far more from the deletions and alterations of their autobiographies than from the published versions . . . more from correspondence that somehow escaped burning, from private diaries, from the petty detritus of the concealment operation. Never was the record so completely confused, never a public facade so successfully passed off as the truth on a gullible posterity.