

Journey of a scientific hero

A fictionalized biologist finally gets the biography he deserves.

Beyond the Outer Shores: The Untold Odyssey of Ed Ricketts, the Pioneering Ecologist Who Inspired John Steinbeck and Joseph Campbell

by Eric Enno Tamm

Four Walls Eight Windows: 2004. 384 pp.

\$26

Jon Christensen

Ed Ricketts is a hero among marine biologists — mention his name and their faces light up. His 1939 field guide, *Between Pacific Tides*, is still in print and is often one of the first books a fledgling marine biologist takes into the field. Outside marine biology, however, few people recognize his name. But Doc from John Steinbeck's novel *Cannery Row*, that's another story. Almost everyone knows Doc.

"It is nearly impossible to separate the man from the myth, Ed Ricketts from Doc," writes Eric Enno Tamm in *Beyond the Outer Shores*. But Tamm does rescue Ricketts from the myth and gives us an account of Ricketts' heroic journey as a scientist who had his finger on the pulse of ecology through his intimate knowledge of the Pacific coast. Ricketts went to the University of Chicago, but did not graduate, before coming west to Monterey, California, to set up shop as a freelance scientist and purveyor of tidal-pool specimens. But he was a doctor of sorts. He diagnosed the environment and humanity, and offered humbling advice that his contemporaries failed to heed and that we are only now beginning to hear. He warned of the dire consequences of overfishing sardines, and realized that even his "slight bit of collecting" in the Great Tide Pool in Monterey probably contributed to the disappearance of some rare brittle stars.

Beyond the Outer Shores is the first biography of Ricketts. Tamm wisely focuses on the collecting trips that Ricketts took north and south along the Pacific coast, and on his friendships with Steinbeck and the great mythologist Joseph Campbell. The quest to understand the Pacific coast was central to Ricketts' life and work. By following that story, Tamm's book is likely to be the best biography of Ricketts for some time, even if others come along to provide more salacious tidbits from the party atmosphere that pervaded Ricketts' Pacific Biological Laboratories, both in Steinbeck's fiction and in real life.

Tamm has a personal interest in this story. He grew up in Canada on the remote western shore of Vancouver Island. In high-school biology class, Tamm surveyed the same beach



Novel research: Ed Ricketts was immortalized as the character Doc in John Steinbeck's *Cannery Row*.

in his village that, he would later discover, Ricketts had studied on his expeditions north to the outer shores. Tamm worked in the fishing industry and became a journalist and an environmental activist. He writes with an impassioned but sure hand. His book is meticulously researched and he has a firm grasp of the material.

It is easy to become lost in Ricketts' own obtuse scientific and philosophical writings, much of it never published in his lifetime. As Tamm puts it, Ricketts' "grammar and sentence structure were as tangled as a kelp bed". And Tamm could easily have gone overboard in siding with scholars who have overplayed Ricketts' profound influence on Steinbeck. But Tamm confidently sets a steady course through these shoals and brings readers along with him on the fascinating journey.

I know what it's like trying to follow Ricketts. This spring I set out from Monterey with a group of scientists from Stanford University's Hopkins Marine Station to retrace an expedition that Ricketts and Steinbeck took to the Gulf of California in 1940 to explore the intertidal zone; the duo collected more than 600 species, some 60 of which were previously undescribed. We went to see how things have changed.

In the book that resulted from their journey, *The Sea of Cortez*, Steinbeck and Ricketts noted that, in addition to sea stars, brittle stars and urchins, they had taken "2,160 individuals of two species of beer". Try as we might to match their enthusiasm, we only managed 1,200 individuals of six species of beer. But we found the gulf profoundly

changed. In "this region of the sea turtle and flying fish", we saw plenty of flying fish, but no turtles. We saw no great schools of tuna and big sharks, as our predecessors had. Instead, we found a new top predator, the jumbo Humboldt squid, *Dosidicus gigas*. And although the invertebrate diversity in the tide pools is still astonishing, it is lacking in species that people eat and collect, such as scallops and *Murex*, which one crew member of Steinbeck and Ricketts' expedition collected by the bushel for girlfriends back home.

"There is more of the whole man, John Steinbeck, in *The Sea of Cortez* than in any of his novels," wrote one critic in a review of the book that is still in print as *The Log from the Sea of Cortez* (although without the species catalogue that made up half the original book and shamefully with only Steinbeck's name on the cover now). "This is at once the record of a serious biological expedition and of the impact of a biologist and a novelist upon each other's minds... The best of Steinbeck is in it."

And the best of Ricketts, I would invariably have added before I read *Beyond the Outer Shores*. Now the best of Ricketts is in Tamm's biography. I read the book when I couldn't sleep for thinking of all the preparations still to be done before our departure to the Sea of Cortez. The thrilling sense of discovery on each page kept me up even longer. I read it again when we returned; it seemed even better the second time around.

Between Pacific Tides, Ricketts' guide to the "good, kind, sane little animals" of the California coast, remains his greatest individual

achievement — with help from friends and followers who cleaned up his prose and kept it updated through five editions. He never finished the grand survey that he dreamed of writing about the entire Pacific Coast, from Baja California to British Columbia. On 8 May 1948, a train hit Ricketts at a crossing near Cannery Row, as he was preparing for an expedition north to the outer shores with Steinbeck. He died three days later.

Ricketts' work was never published in scientific journals. His prescient analysis of the crash of the California sardine fishery was published in a local paper. His best ideas about ecology and humanity found voice in the writings of his friends, Steinbeck and Campbell. Now the whole life and work of Ed Ricketts can be found between the covers of *Beyond the Outer Shores*. ■

Jon Christensen is a Steinbeck fellow at San Jose State University, San Jose, California 95192-0090, USA.

.....
Peas and helices

Mendel's Legacy: The Origin of Classical Genetics

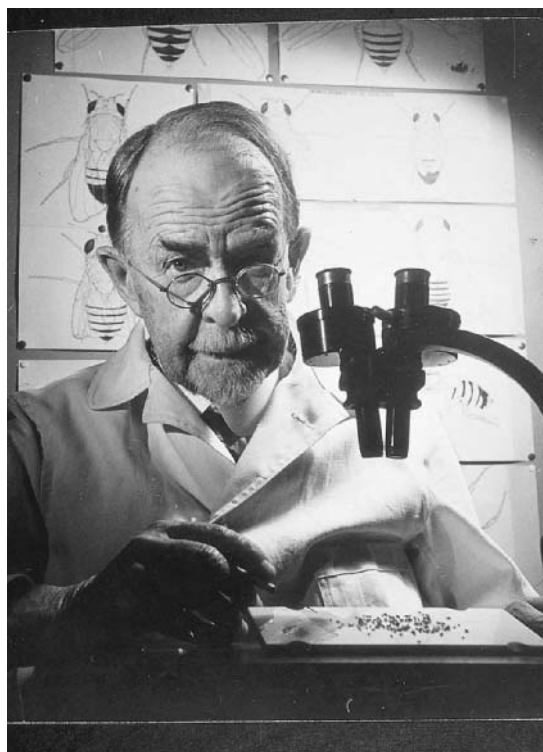
by Elof A. Carlson
Cold Spring Harbor Laboratory Press: 2004.
 352 pp. \$45

Garland E. Allen

Elof A. Carlson has added another important book to his list of publications on the history of genetics. *Mendel's Legacy*, in one sense a follow-up to Carlson's much earlier but still very useful *The Gene: A Critical History* (1966), represents the culmination of his work so far on the historical origins of classical genetics in the first half of the twentieth century.

Carlson defines classical genetics both chronologically and conceptually. He covers the first half of the twentieth century from the rediscovery of Mendel's work in 1900 to the publication of Watson and Crick's paper on the structure of DNA in 1953, and encompasses a number of strands of scientific thought going back into the nineteenth century. He justifies ending his story with the discovery of the double helix on the grounds that none of the preceding work based on the mendelian and chromosome theories led directly to discoveries about the molecular basis of heredity. Nor has classical genetics been replaced, in Carlson's view, by molecular genetics. Rather, the two have been integrated such that, although the molecular details of genetics are quite different from anything classical geneticists could have imagined, genes remain the fundamental elements of heredity, evolution and development.

In depicting the course of classical genetics, Carlson devotes chapters to the history



Model work: T. H. Morgan studied the genetics of fruitflies.

of evolution, cytology, embryonic development and agricultural breeding (principally the hybridization tradition in which Mendel worked). He asks a crucial historical question: if the roots of classical genetics lay in scientific traditions that were all developed in Europe, why did the United States become the place where mendelian genetics developed most rapidly and, in some ways, most successfully? Part of the answer clearly lies in the strong agrarian base in the United States at that time, with growing governmental support of agricultural research stations and the application of science to practical results.

Another part of the explanation, Carlson argues, is that the structure of the US university system was less encumbered with rigid, top-down professorial hierarchies than those in Europe. Once classical genetics had taken off, with T. H. Morgan and his group's work with the fruitfly, *Drosophila melanogaster*, and R. A. Emerson's group working on maize, the theory flourished by combining the cytological study of chromosome mechanics with breeding and hybridization experiments.

Carlson devotes a fair amount of space to cytology and cytogenetics, but includes the major players from all aspects of the work, including Hugo De Vries, Wilhelm Johannsen, Herman Nilsson-Ehle, W. E. Castle, E. B. Wilson, Barbara McClintock, J. B. S. Haldane and many others. *Mendel's Legacy* contains good thumbnail descriptions of the critical observations and experiments that went into the formation of the classical theory (more so, for example, than Robert Kohler's *Lords of the Fly*) while still incorporating

aspects of Kohler's study of social dynamics in the Morgan group. There is also a chapter on the fusion of mendelian genetics and darwinian evolution (the evolutionary synthesis), and glimpses into the problematic relationship between classical genetics and development in a discussion of E. B. Lewis's work on the homeotic gene complex (bithorax) in *Drosophila*.

Several outstanding features of this book will make it useful for specialists and non-specialists alike. One is the attempt to show how classical genetics was involved with political issues in the twentieth century, using three examples: eugenics (1883–1945), the Lysenko controversy in the Soviet Union (1930–1960), and the controversy over the genetic effects of radiation (1946–1970). Another noteworthy feature is the use of chronological tables for the whole field (at the beginning of the book), as well as for specific sub-topics, such as contributions

to the chromosome theory of sex determination, or geneticists' educational background. A third valuable feature is the author's liberal use of high-quality illustrations, including photographs of many geneticists seldom pictured before, original figures from published papers, and the title pages of important papers and books. The publishers, Cold Spring Harbor Press, have produced an attractive and useful book.

By its nature, *Mendel's Legacy* has to be selective, so issues of the philosophical basis of the gene, on which much has been written in recent years, are omitted. This is a pity, particularly because the issues that underlie many of the disputes that Carlson describes reflected strong philosophical biases that separated the more holistic approach found among European (especially German) geneticists, such as Richard Goldschmidt (who for a major figure gets scant treatment), from the reductionist approach of the American school. National distinctions such as those described so well by Jonathan Harwood in *Styles of Scientific Thought* (1993) do not form a significant part of Carlson's story. Historians of science will also look askance at the sharp distinction that Carlson draws between science that he claims lacks political content (such as the function of the accessory chromosome) from that which is overtly political (notably eugenics).

All in all, however, these are minor deficiencies in a book that will certainly have broad appeal, especially within the biological community. ■

Garland E. Allen is professor of biology at Washington University, St Louis, Missouri, USA.