

Book review

Southwood's Kaleidoscope

A review by M. Schilthuizen

The Story of Life. By T. R. E. Southwood. Oxford University Press. 2003. Cloth \$28 ISBN 0-19-852590-7. 264 pp.

The past 10 years have seen several broad-audience science books that all could have been titled 'The Story of Life.' There was Richard Fortey's 'Life: An Unauthorised Biography', and also John Maynard Smith and Eörs Szathmáry's 'The Major Transitions in Evolution' and 'The Origins of Life'. There probably have been more, but these three immediately spring to mind. Each describes the most important events in the history of life on Earth, and it is interesting to compare Sir Richard Southwood's new book with these earlier accounts. Maynard Smith and Szathmáry view the history of life largely from a genetic viewpoint, with each major step as an innovation in the transmission of hereditary information. Richard Fortey, on the contrary, has a different perspective, namely that of the palaeontologist/systematist, and he sees phylogeny and the evolution of new body plans as one of the chief aspects of life's bumpy ride through time. Now, with Southwood's admirable contribution, we have a third angle. Understandably for one of today's most eminent ecologists, he tells the story from a very ecological viewpoint.

This makes for some very interesting reading, which is more due to content than to style: I cannot say that I find the book very engagingly written. It developed, as Southwood explains in the preface, from an undergraduate lecture series given at Oxford for 18 years. As with any story that has been told and retold that often, it is perhaps not surprising that it loses some of its brilliance when, at the 19th time, it is finally entrusted to paper, even if that story is such a magnificent one as the Story of Life itself. Southwood's style is solid, authoritative, but here and there a little dry. The book also seems to have been written (or edited) in haste. The frequency of small errors (in typography, grammar and structure) increases to almost unacceptable levels towards the end of the book, where important scientific names like Oligocene, *Homo erectus* and manatee are all misspelt.

So the book could have been better if it had been written with a little more care and devotion. I am not saying it is a bad book – far from it. It is filled with gems

of ecological and biomechanical insight that appear to come naturally to Southwood, but are near-revelations to most of us. These range from simple observations to insights of mind-boggling magnitude. As an example of the former, Southwood points out in passing that orbweb-building spiders are really the aerial equivalent of filter feeders. With the same ease, he manages to link such seemingly distant concepts as heat capacity and global biodiversity in a few deft strokes. The lower heat capacity of land compared with water, he explains, directly causes the greater range and speed of temperature fluctuations in terrestrial conditions. This in turn produces a land environment that is much more variegated in abiotic conditions, hence niches, and presto! Up comes the explanation for the greater number of species on land compared with the marine world. Obvious, really, but it takes a long life of sharp observation to paint pictures with such clarity, like a Picasso of ecology.

The vagaries of geography take a central role in the book, anyway. Each chapter (arranged, of course, according to the main geological epochs) starts with a map of the land and sea distributions at that point in time. Southwood takes care to draw parallels between the arrangement of continents around the globe, global climate and ecological patterns. He suggests, for example, that towards the end of the Proterozoic, when Gondwanaland began to reassemble, many shallow seas lay between the landmasses, which would have ameliorated the terrestrial climate. This then may have set the stage for the Ediacaran fauna. In a way the ever fragmenting and rejoining tectonic plates of his chapter headings become the chips in his metaphorical kaleidoscope, a recurrent theme in the book where major geological events are like jolts to the kaleidoscope that reshape Earth's ecosystems.

Curiously absent from the book are references to evolution, which may come as a disappointment to readers of this journal. Two or three pages in the Introduction outline the basic processes of evolution and the concept of phylogeny, but these are hardly ever met again in the body of the work. In Southwood's story, taxonomic and ecological groups of organisms 'appear' on stage from the side wings often without so much as an indication on their phylogenetic affinities or the selection pressures responsible for their appearance. Still, for the story that is told this is not really a problem. But it does mean that we would need to read Southwood's book as a

companion to the ones by Fortey and Maynard Smith & Szathmáry to get all sides of The Story of Life.

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