

precision in publications describing their state is vital.

Both books review the published methods of immobilization but the volume by Rosevear, Kennedy and Cabral is explicitly a "laboratory book", giving guidance to the student or research worker who needs to choose an appropriate method. The Tampions' volume mixes principles, methods and applications, its target audience is less clear and the exclusion of enzymes is justified in rather odd terms, thus: "The interest in immobilized cells draws attention to the fact that due to economic or scientific reasons there are drawbacks to the use of comparable immobilized enzyme systems". However, the "classical" example of industrial application cited — high-fructose corn syrup production — uses principally immobilized enzyme and not immobilized cell technology, as the book indicates. Rosevear and his colleagues recognize this but state the tonnage a million-fold low at three tonnes per year in North America.

Industrial research on immobilized enzymes has fallen back from a peak because it failed to address fully the key issue, which is that many enzymes are still not sufficiently stable for practical application even when immobilized. It seems likely that cell immobilization studies as currently carried out will also falter because often the cells do not perform well for long enough. Neither book sets out to address these issues or the possible solutions such as protein engineering for enzymes and genetic engineering for cells. Protein engineering techniques already show promise in the preparation of more stable enzyme catalysts, and in principle we have the knowledge to alter the genetic material of a cell so as to separate synthetic capabilities from reproductive ones. The researcher must bear in mind that these newer techniques, and the recent development of better synthetic membranes for retaining biocatalysts rather than immobilizing them, may be of great importance in the future.

To be fair, the present authors would have found little literature to review on these innovations. Both books make a valuable contribution to the business of keeping up with one of the main techniques of biotechnology, and, if the intrinsic properties of free enzymes and cells can be improved, they will help to usher in a new era of applied biocatalysis. □

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• Just published by Elsevier Applied Science is *Bioreactor Immobilized Enzymes and Cells: Fundamentals and Applications*, edited by Murray Moo-Young, a collection of papers covering the full range of cell types along with applications of the systems. Price is £39.

Capital letters

Colin Patterson

Simple Curiosity: Letters from George Gaylord Simpson to His Family, 1921–1970. Edited by Léo F. Laporte. *University of California Press: 1987. Pp. 340. \$29.95, £16.70.*

GEORGE Gaylord Simpson (1902–1984) was identified as "the greatest paleontologist since Cuvier" by the supervisor of his PhD, and is referred to as "the Darwin of the twentieth century" in the blurb of this book. Neither opinion stretches belief. Simpson was a prodigious worker: in 60 years, he published hundreds of technical



G. G. Simpson — an exceptionally gifted youth.

papers and over 20 books, among them two personal memoirs. The first was *Attending Marvels: A Patagonian Journal* (1934), the second *Concession to the Improbable: An Unconventional Autobiography* (1978).

Attending Marvels is a wonderful travel book, the account of GG's first fossil-collecting expedition to Patagonia in 1931–1932. It is full of the fire and joy of an exceptionally gifted youth. *Concession to the Improbable*, GG's autobiography, though still characterized by style and wit, left a sour taste with many readers; inevitably, it is an old man's book. *Simple Curiosity* fills some of the gap between those two memoirs. The letters collected here were written to his sister Martha (1898–1984) and to his parents. Martha had deposited about 150 family letters in the American Philosophical Society, and others were found among Simpson's papers after his death.

In Simpson's autobiography, his youth,

up to his return from Patagonia in 1931, occupies hardly 10 per cent of the text. Happily, more than half of this new book covers the decade 1921–1931, and great fun it all is. During that time, he studied at the University of Colorado and at Yale; married, had four daughters, and separated; spent a year in London, a summer in Paris, a year in Argentina, and travelled widely in Europe and North America; he learned French, German, Spanish and Egyptian (hieroglyphs); published about 70 scientific papers and two books; became associate curator of fossil mammals at "the greatest Natural History Museum in the world" (the American Museum of Natural History); and detailed his delight in all this, principally in the letters to his sister.

The title of the book, *Simple Curiosity*, must have been suggested to Laporte by its recurrence in two letters to Martha (1926 and 1927) on the motives of the scientist. These early letters are full of lively commentary on ideas and events, with much high-class whimsy, some graphic, some polyglot, some in doggerel. One 1929 letter begins with three paragraphs that would sit well in John Lennon's *In His Own Write* before switching into French (translated by the editor). Léo Laporte has done a graceful job as editor, splitting the letters chronologically into a dozen more-or-less coherent sections, introducing each by a commentary and an apt photograph, and providing footnotes just where one needs them.

My only dissent from Laporte's editorship (admittedly a major one) concerns the last third of the book. On returning to New York from Patagonia in 1931, Simpson filed for separation from his first wife, and in 1936, after another absence of almost a year in Patagonia and Europe, sued for divorce. The long and unpleasant suit chronicled in the letters finally ended in 1938, and within a month Simpson married the psychologist Anne Roe, who had grown up with him in Denver. They remained together for 46 years (and in the 1960s became the first married couple each to hold full professorships at Harvard).

For whatever reason, after the marriage in 1938 the spark goes out of Simpson's letters to his family and they hardly record more than comings, goings and thank-yous. The wartime letters (Simpson was in North Africa and Italy for 18 months in military intelligence) are constrained by censorship and format, and after the war, apart from a couple of pages of hilarity on the organization of Harvard, there is little beyond the family album. If Laporte had stopped short in 1938, we should have had a smaller book, but a more remarkable portrait of a most remarkable man. □

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