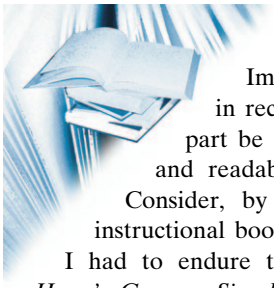
works) and the detailed index give rapid access to the primary literature and reviews.

Christian W. Lehmann
Max-Planck-Institut für Kohlenforschung
Mülheim an der Ruhr (Germany)



Giant Molecules

Improvements in education in recent years can in a large part be attributed to the beauty and readability of modern books. Consider, by way of contrast, how instructional books used to be. As a boy I had to endure the dreadful, pictureless *Hugo's German Simplified*. In text written on newsprint, I read words such as dative, genitive, and accusative along with six ways to say "the" … all this appearing on the first page! Students should cheer that books such as *Giant Molecules* by Walter Gratzer are now available. In a small book, with only about 250 pages, potential drudgery has become joy as the author describes both natural and synthetic polymers. Polymer science, made even more interesting by historical vignettes, includes topics such as: muscle contraction, graphene, dendrimers, DNA computers and machines, polymerase chain reaction, photonics, microarrays, plastic organs, proteoglycans, Nafion, mucopolysaccharides, biometrics, rubbery elasticity, supramolecular polymers, cosmetics, desalination, and adhesives, to name but a few.

An inevitable question arises: To whom is this book intended? The author writes: "The narrative demands no advanced or specialized knowledge and is meant to be accessible to the layman. Chemistry at a basic level would of course be helpful." In my view the goal of the author has only been partially met. Since an enormous amount of subject matter is covered in a short book, its "information density" seems at times rather compressed. The problem is compounded by an absence of diagrams at places where pictorial representations are clearly called for. Consider the following non-illustrated quote, selected more or less arbitrarily, from a section entitled "Photonics":

"In the photoreactive device, stacks of polymer sheets with alternating higher and lower refractive index stripes can produce, by virtue of constructive interference (intensity reinforcement wherever two light rays oscillate in phase—the peaks of the waves exactly coinciding), a very high reflectivity for light of a chosen wavelength, determined only by the thickness of the layers. The refractive index is controlled by 'doping'—in short contaminating—the polymer sheets with a suitable material. This is commonly a collection of tiny beads, a few ten thousandths of a centimeter across; they are generally made of silica (quartz), but block polymers have also been synthesized in which the blocks spontaneously fold on themselves to form submicroscopic crystal-like cubes, to produce a similar effect. With such devices holographic images can be repeatedly created, expunged, and replaced. Other geometrical forms should inspire new developments."

It is difficult for me to imagine a layman grasping this paragraph. More likely, eyes will glaze over. But this is not quite fair. The book does have lucid and entertaining material in it. For example, consider this gem:

"A remarkable example of a composite, ill-starred as it proved, was pykrete, developed during World War II by the eccentric inventor Geoffry Pyke. The plan was to construct floating airstrips in the North Atlantic on which aircraft flying between America and Britain with war materials could refuel. Ice is highly brittle—a block of ice struck with a hammer will shatter—but Pyke found that if packed with wood-pulp fibers it was transformed into a medium, pykrete, of enormous toughness. When Pyke demonstrated the properties of his invention before a group of dignitaries by firing a revolver at the block of material, the bullet ricocheted around the room, narrowly missing several spectators."

I will include this story during a lecture on polymers and composites in my science and technology course (given annually to a class of 80 humanists). I learned of it, along with many other accounts, from *Giant Molecules* by Walter Gratzer.

Fredric M. Menger
Department of Chemistry
Emory University, Atlanta (USA)

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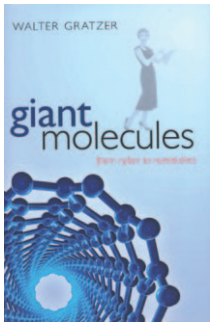

Giant Molecules
From Nylon to Nanotubes. By Walter Gratzer. Oxford University Press, Oxford 2009. 254 pp., hardcover € 14.99.—ISBN 978-0199550029