

This review is from: *Life's Matrix: A Biography of Water* (Paperback)
By Joel M. Kauffman

Source not found

"Fascinating, but error prone", May 20, 2004

Full of quotations of classics and poetry, written as literature with wonderful similes and metaphors, this "Biography of Water" roams from ancient civilizations to outer planets. The middle third was the most satisfactory, with details of the various forms of ice, how organisms cope with freezing, and what makes water so unusual. Explanations of its hydrogen bonding patterns and how they might change to make ice less dense than liquid water, and the funny shrinkage of water above its melting point and are all interesting. The many functions of water in biological systems, right down to the molecular level are given, and there are a number of cleverly done diagrams.

Ball's major blunder in this middle part was his complete failure to explain what holds normal liquids together, that is, what are the van der Waals forces (p165)? This leads to an absurd reason for the cohesion cell membranes, where the hydrocarbon tails of lipid bilayers are said to be held together merely by their repulsion of water (p253). Most college chemistry texts do better on both counts (including Linus Pauling, "General Chemistry", 3rd ed., 1965). The UV light from the sun is presented as detrimental only (p235). Ball seems unaware that vitamin D is formed from the action of UVB on cholesterol in the skin, and that there is less cancer the closer humans live to the equator. In recounting all the effects on the development of life (atmospheric composition, heat, cold, nutrients), Ball ignores the contribution of 10 times the radioactivity the Earth now has in promoting chemical reactions and mutations long ago (see T. D. Luckey, "Radiation Hormesis", 1991).

More minor problems are speaking of a vacuum "sucking" (p240), the pH of stomach acid as 1 rather than 1-3 (p247), missing the true function of the Glomar Challenger as a submarine salvage vessel (p47), a confusion of the effect of pressure on a melting point by comparing with the effect of pressure on the boiling point of water (p51), implying that the reaction of sulfur dioxide with water gives sulfuric acid (p101) rather than sulfurous acid, and that paraffin wax has a viscosity anywhere near as low as 15 centipoises (p282).

It is when Ball enters the realm of politicized science that serious misinformation flows. Water vapor is by far the most important greenhouse gas and human activities add plenty of it to the atmosphere by irrigation, burning methane which puts 2 molecules of water into the air with just 1 of carbon dioxide, of burning gasoline, jet and diesel fuel, unlike p66. See "Hot Talk, Cold Science" by S. Fred Singer. Cold fusion has been replicated in half a dozen laboratories; the reality of the effect cannot be dismissed by ignoring the publications and merely listing ones that do not show the effect) (p307). See "Excess Heat" by Charles G. Beaudette, 2001. Memory effects in water at really high dilutions are real (see Lionel Milgrom, *New Scientist*, 11 Jun 03). Homeopathy effects were demonstrated against placebo in trials (*BMJ* 1991;302:316-323), all contrary to p334.

Read this "chocolate and cherry syrup coated" book at your own risk.

--Joel M. Kauffman 20 May 04