

Mirror-Image Asymmetry

Chemical chirality is normally considered to be a secondary topic in chemistry. Chirality arises through the arrangement of the atoms, and in complex systems it also determines the properties that define life. Chirality therefore constitutes the metaphysical basis of chemistry. We chemists tend to avoid and dislike metaphysics, and so we choose to overlook the fact that, in cosmological evolution, chirality or the breaking of mirror symmetry has the starting role at both ends of the range occupied by chemistry as a science. The present book shows that some chemists, after much work on chirality, have begun to wonder about the deeper meaning of chirality and about the relationship between chemical chirality and the chirality of physical objects. A common element in such reflection is the feeling that perhaps something important was missing from the research work.

One criticism of Riehl's book is that it follows the orthodox line of chemistry, i.e., a description of facts that does attempt to distinguish precisely between what may be considered a cause and what its effect. A clear example of this is the discussion about the paintings of the human hand in prehistoric caves. The debate explores the ratio of right-handers to left-handers among our ancestors, but it fails to examine the reasons that induced Neolithic man to produce such paintings. Was not such painting a pre-scientific meditation about how it is possible that the hand depicted as emerging from the rock has the opposite handedness to that of the template? A chemist writing a popular science book such as this should not restrain his imagination, and should compare the impulse of the cave man to paint his hand, thus creating a mirror world inside the rock, to his own impulse several thousand years later to write a book on chirality.

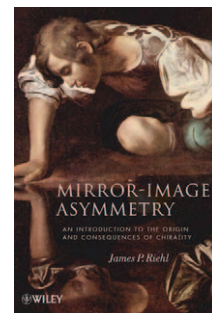
The book is not a scientific monograph on chemical chirality, neither is it a metaphysical essay on the role of the breaking of mirror symmetry in chemical cosmological evolution. Rather, it is a popular science book on chirality from the point of view of a chemist. Books of this type on presenting scientific disciplines to a lay readership are common in fields other than chemistry, but there are few precedents coming from chemists. The presentation and orientation of the book are excellent when we take into account that the potential readers are not chemical researchers. The book would be suitable as a gift from a chemist to a person interested in science. Therefore its publication must be welcome, but in my opinion the book seems to be wrongly classified in a category where I would expect to find a chemical monograph or textbook.

It should not be expected that researchers active in the area of chirality will be among the readers of this book. Nevertheless, the book contains a wealth of facts about chirality in biological and social behavior that may be useful as an anecdotarium box for presentations and lectures. Much more important, however, is that the seemingly wrong placing of this work in a list of chemical monographs might lead researchers working on chemical chirality to read the book, and they might then become aware of the lack of knowledge about the causes that relate the chemistry of symmetrical and of chiral molecules to organized living systems. Perhaps this could be the stimulus that they need to write a metaphysical essay on chemical chirality, or even to direct their research towards the role of chirality in complex systems.

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