

BRIEF REVIEWS

Vier Bücher von Symmetrie

Apologies to Dürer, the author of the work *Vier Bücher von menschlicher Proportion* (Nürnberg, 1528), Latin translation, *De simmetria partium in rectis formis humanorum corporum libri* (Nürnberg, 1532-34), Italian Translation, *Della Simmetria dei Corpi Humani* (Venice, 1591)

The scholarly literature is mostly in English, is not it? There are, however, exceptions. Very recently, four interdisciplinary monographs were released in German. Note that all the authors are founding members of ISIS-Symmetry: It is a small world after all...

Burckhardt, J.J., *Die Symmetrie der Kristalle: Von René-Just Haüy zur kristallographischen Schule in Zürich*. [The Symmetry of Crystals: From René-Just Haüy to the Crystallographic School in Zürich, in German], Basel: Birkhäuser, 1988, 195 pp.

Burckhardt, who was elected as an Honorary Member of ISIS-Symmetry at its first symposium, is a well-known personality in both mathematical crystallography and the history of science. His pioneering monograph on symmetry groups of crystallography (*Die Bewegungsgruppen der Kristallographie*, Basel, 1947; 2nd edition, 1966) even forced some American scholars to learn German. He also coauthored a paper in 1961 with van der Waerden about colored symmetry which became a milestone in that topic. Burckhardt's interest in the history of science can be demonstrated by his contribution to the editing of the collected works of Euler, articles written for the *Dictionary of Scientific Biography*, and some important papers about symmetry (Fedorov and Schoenflies's correspondence, Frankenheim's discovery of the 32 point groups, etc.). The present book is a masterpiece of historical survey of the sources: very many paragraphs and figures are quoted or reprinted from basic works. The book also includes a fine collection of portraits. A section about the discovery of the 230 crystallographic space groups by Fedorov and Schoenflies is written by Erhard Scholz, rather than by Burckhardt, thus making possible an additional "social symmetry" between two generations of historians of science.

Caglioti, G., *Symmetriebrechung und Wahrnehmung: Beispiele aus der Erfahrungswelt*. [Symmetry-Breaking and Perception: Examples from the Empirical World, in German], Trans. from Italian by G.-A. Pogatschnigg, Braunschweig: Vieweg, 1990, x + 200 pp.

This reviewer spent most of his very limited free time during the 1985 *Escher Symposium* in Rome with a "broken symmetry": to buy a copy of the original Italian edition of this book *Simmetrie infrante nella scienza e nell'arte* [Broken Symmetries in Science and Art], although it was published in Milan (CLUP, 1983). As a spontaneous symmetry (*sic*) he could buy a copy, maybe the only available one in the bookshops of Rome, in the last minute before departure. The conclusion was immediate: we should learn Italian. It is very fortunate that we now have the extended version of this book also in German with the new "synergetical" introduction by Hermann Haken (and there are rumors about a Japanese edition). The scope of the book is very broad: Caglioti, himself a physicist, guides us from natural structures to works of art, from information theory to dynamic instability. We may also meet Maxwell's demon as a doorman of the Café Chéz Maxwell, where the atoms are replaced by good looking girls. We have found a spontaneous broken

symmetry in the otherwise very useful bibliography: the editor of the book *La simmetria* (Bologna, 1973) is not Agassi, but Agazzi. This s-z symmetry (or dissymmetry) may represent an interesting coincidence: both names are well known in the history and philosophy of science.

Hahn, W., *Symmetrie als Entwicklungsprinzip in Natur und Kunst*. [Symmetry as a Developmental Principle in Nature and Art, in German with English summary], Königstein: Langewiesche, 1989, 320 pp., 690 black-and-white and 121 color illustrations.

Here we have a true Renaissance man talking about a Renaissance topic. This book by the biologist-artist or artist-biologist author is cited in the introductory survey of this issue. The richness of illustration by a single author is probably unparalleled in our age. The conventional bibliographic description of the number of illustrations is very misleading: the actual number would be astronomical, because many of the figures are composed of further ones (e.g., Figure 188 includes 88 individual shapes, Figure 189a presents 24 stamp-sized reproductions, etc.). Hahn's masterpiece is rich not only in illustrations and data, but also in ideas connecting various fields. The monograph will inspire further discussions and cooperations. We should learn the secret of the Hahn Research Institute (please do not misunderstand this name: it is a one-person institute operated probably, as the warm dedication suggests, with family help). The book has an interesting connection with ISIS-Symmetry: Hahn's English summary at the end of the book was written originally for the Society.

Mainzer, K., *Symmetrien der Natur: Ein Handbuch zur Natur- und Wissenschaftsphilosophie*. [Symmetries of Nature: A Handbook on the Philosophy of Nature and Science, in German], Berlin: Gruyter, 1988, xii + 739 pp.

The number of pages is not a misprint (and the price is, unfortunately, symmetrically proportional to this richness). This book will definitely become a significant handbook in the field. As a further symmetry, J.J. Burckhardt wrote about it in the *Mathematical Reviews* (1989, issue *i*, item 00033). We hope that this luxury edition will be followed by a cheaper paperback version. There are already some interdisciplinary courses on symmetry at some universities, and to assign or recommend appropriate reading material (we avoid using the conventional word "textbook") is usually a problem, in spite of the existence of a large number of books on symmetry. Some chapters of Mainzer's book certainly can be used for such a purpose. The author follows the main development in chronological order from the ornaments of early civilizations and ancient polyhedra to modern crystallography and physics. The last chapter is a *tour de force* of philosophy, the main field of the many-sided author, and also of modern arts. The book would obviously be a wonderful birthday present for scholars and students of almost any field.

We hope that all of these books will be translated into English to reach a broader audience. In that case we should speak not about *Vier Bücher...*, but about *Four (Exciting) Books on Symmetry*. Detailed reviews (in English) of some of these monographs will appear here.

Dénes Nagy

About phyllotaxis in Chinese

Do you speak Chinese? If not, but you would like to follow the Chinese botanical-mathematical literature, you definitely should have access to a copy of Roger Jean's book in Chinese (Beijing: Academic Publisher, 1990, 18 + 224 pp.). Do not worry, it is available also in English: *Mathematical Approach to Pattern and Form in Plant Growth* (New York: Wiley, 1984, xxiv + 222 pp.). The focus of the monograph is the phyllotaxis or phyllotaxy which term was formed, in the 19th century, from the Greek words *phylon* (leaf) and *taxis* (arrangement). Charles Darwin was among the first biologists who used the word in English, in a letter in 1863.

Why do we recommend this book for university collections, and not only for Chinese readers? Every scholar who tries to read a monograph in a foreign language realizes that the usual dictionaries do not give too much help in scientific terminology. It is also a typical problem for international students. Károly Simonyi, a Hungarian physicist-engineer, went as far as publishing a Chinese-Hungarian Electronical Dictionary, in addition to his textbooks and monographs in five languages. We should assure the reader that there already exists a very useful English-Chinese dictionary in the field of phyllotaxis and related mathematical and botanical expressions. The editors of the Chinese translation, instead of a usual subject index, also provided a dictionary (pp. 206-224). If someone needs such expressions in Chinese as "Adler's contact-pressure model" or "Jean's interpretative model", please see this dictionary. (Note that both of these terms are named after founding members of ISIS-Symmetry.) Although this bilingual index is organized according to English keywords, its visual arrangement makes it possible to use it for finding the English equivalent of a Chinese word. To be more specific, the English and Chinese expressions are ordered "symmetrically" in two columns.

The Chinese editors reprinted the whole bibliography of the English edition without change. It is an advantage to the English speaking reader, but it does not represent the Chinese literature in the field. This reviewer, who tries to follow the literature on phyllotaxis from China to Africa (with some difficulties), recalls that even the very first issue of the Chinese periodical *Journal of Biomathematics* included an article about the topic:

Li, Jing Gong (1986) On plant phyllotaxy.
[Chinese, with English summary],
Journal of Biomathematics, 1, 1-8.

The original bibliography by Jean is very detailed; it includes not only English and French, but also many German works and even a Hungarian one (Z. Szabó's article of 1930). On the



(加) R. V. Jean 著

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other hand, the decision to reprint the bibliography, instead of translating and extending it, has an advantage: the number of misspelled foreign names is not increased further (cf., D'Arcy Thomason, Aodler, Schwendeunr, Van Iteson, etc.; even Snow became Show in one case in the "dictionary" we praised so much).

The author wrote a new foreword to the Chinese edition, (published only in Chinese), in which he emphasizes the interdisciplinary character of the topic and the need for dialogue between researchers, with various backgrounds, world-wide.

Dénes Nagy

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