



Design in Nature: Learning from Trees

By Claus Mattheck

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Design in Nature: Learning from Trees By Claus Mattheck

The chicken bone you nibbled yesterday and threw away was a high-tech product! Not only that: it was a superlative light-weight design, functionally adapted to its mechanical requirements. No engineer in the world has, as yet, been able to copy this structural member, which is excellently optimized in its external shape and its internal architecture as regards minimum weight and maximum strength. The tree stem on which you recently carved your initials has also, by life-long care for its body, steadily improved its internal and external structure and adapted optimally to new loads. In the course of its biomechanical self-optimization it will heal up the notch you cut as speedily as possible, in order to repair even the smallest weak point, which might otherwise cost it its life in the next storm. This book is dedicated to the understanding of this biomechanical optimization of shape. It is the synthesis of many years of extensive research using the latest computer methods at the Karlsruhe Research Centre to help understand the mechanism of biological self-optimization (adaptive growth) and to simulate it by computer. The method newly developed for this purpose was called CAO (Computer-Aided Optimization). With this method, it is possible to predict the growth of trees, bones and other biological structures from the tiger's claw to the sea urchin's skeleton.

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Editorial Review

Review

From the reviews

"I recommend this book to biologists and engineers alike." *Nature*

"...delightful ...this book is a visual feast for engineers and industrial designers, while the photographs and exuberant prose make it accessible to all." *New Scientist*

Language Notes

Text: English (translation)

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From the Back Cover

The chicken bone which you nibbled and threw away yesterday was a high-tech product! In fact it was a superlative light-weight design functionally adapted to the mechanical requirements. No engineer in the world has as yet been able to copy this structural member, which is excellently optimized in its external shape and its internal architecture as regards minimum weight and maximum strength.

The tree trunk on which you recently carved your initials has also over the course of its life, steadily improved its internal and external structure and adapted itself optimally to new loads. In the course of its biomechanical self-optimization, it will heal the notch you cut as speedily as possible, in order to repair even the smallest weak point, which might otherwise cost it its life in the next storm.

This book is dedicated to the understanding of this biomechanical optimization of shape. And not only that: With the knowledge of these perfect processes of self-optimization in nature, techniques for the improvement of mechanical structural members could be developed. Industry already uses them. Nature shows us the way to eco-design, to machines in accordance with nature's laws governing structures and shapes.

CLAUS MATTHECK: Born in Dresden, Germany in 1947. Study of physics in Dresden, PhD in theoretical physics in 1973. Habilitation in the field of damage control in 1985. Lectures on biomechanics at the University of Karlsruhe. Head of the Department of Biomechanics of the Research Centre in Karlsruhe, where the results described in this book were obtained. Several awards in science and literature.

Users Review

From reader reviews:

Gabrielle Ponds:

Book is definitely written, printed, or outlined for everything. You can understand everything you want by a publication. Book has a different type. To be sure that book is important matter to bring us around the world. Close to that you can your reading ability was fluently. A publication *Design in Nature: Learning from Trees* will make you to end up being smarter. You can feel more confidence if you can know about every thing. But some of you think this open or reading any book make you bored. It isn't make you fun. Why they can be thought like that? Have you seeking best book or appropriate book with you?

Edward Bastian:

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Martha Royal:

Typically the book Design in Nature: Learning from Trees has a lot of knowledge on it. So when you check out this book you can get a lot of advantage. The book was published by the very famous author. Tom makes some research prior to write this book. This particular book very easy to read you can get the point easily after looking over this book.

Kirk Thomas:

People live in this new moment of lifestyle always make an effort to and must have the spare time or they will get large amount of stress from both everyday life and work. So , whenever we ask do people have spare time, we will say absolutely indeed. People is human not only a robot. Then we inquire again, what kind of activity have you got when the spare time coming to you actually of course your answer will certainly unlimited right. Then ever try this one, reading guides. It can be your alternative in spending your spare time, the actual book you have read will be Design in Nature: Learning from Trees.

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