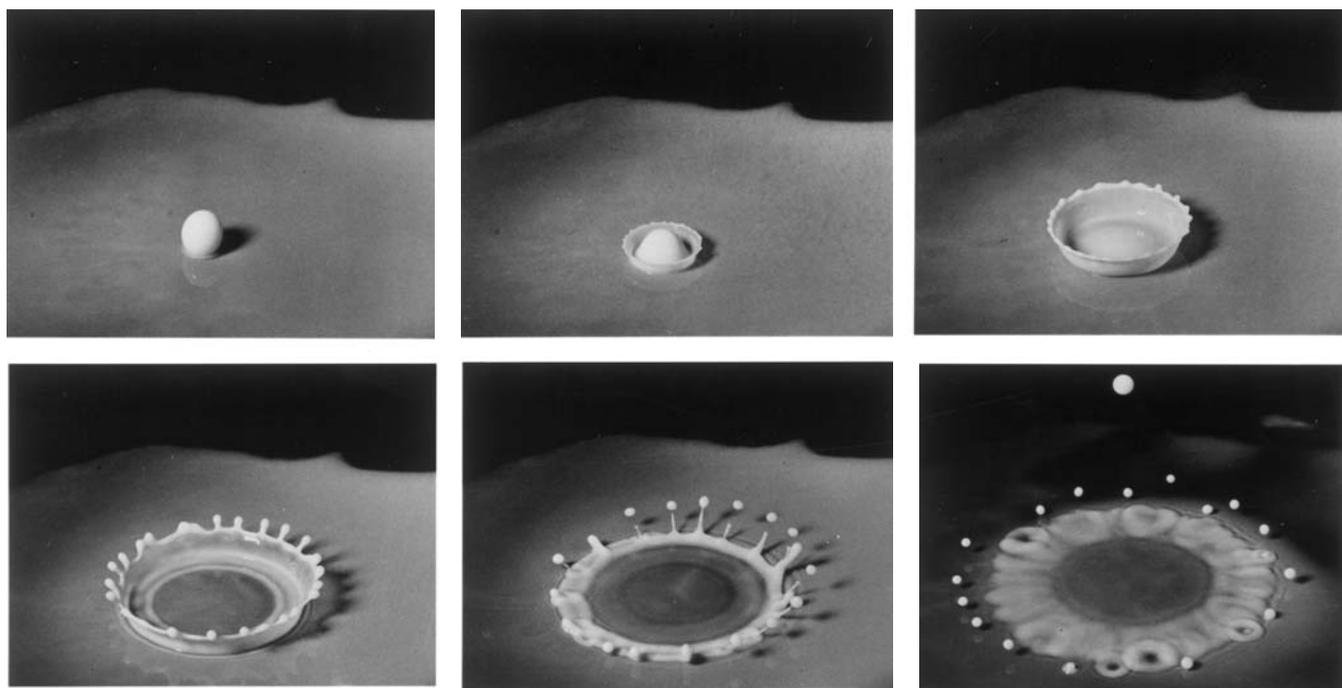




By Angus W. Stocking, LS

After a 17-year surveying career in several states, Angus Stocking now lives in Paonia, Colorado where he is establishing an organic farm and a freelance writing career. He remains actively involved in surveying.

The Process of Creating Life



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In my last column, “Life, the Nature of Order, and Everything” [May 2005] I reviewed *The Phenomenon of Life*, which is the first book of architect Christopher Alexander’s four-volume set, *The Nature of Order*. This column is dedicated to the second book in the series, *The Process of Creating Life*.

The major theme of Alexander’s career has been to imbue more “life” into the built environment. He contends that a living building cannot be designed and then built to plan; rather, it evolves from decisions made *during the construction process*. Design and construction turn out to be pretty much the same thing.

But why, asks Alexander, do natural processes so often create beauty and a feeling of rightness, when human methods so rarely do? What is the difference?

High-speed stroboscopic photography reveals distinct phases in the splashing of a milk drop.

In a series of fascinating examples ranging from a wave breaking, to a glass plate shattering, to a fetus developing, Alexander shows convincingly that development processes in nature are a series of **structure-preserving transformations**. Each recognizable phase of development follows naturally from the preceding phase. Put another way, each phase of development *preserves* and *extends* the wholeness of the preceding phase—the wholeness is never destroyed, it **unfolds** into a new wholeness.

Consider the sequence of photos of a splashing drop. Though discrete phases of the sequence are startlingly different from each other, the changes from moment to moment are gentle and

comprehensible. Alexander argues convincingly that this is a feature of *all* natural development.

Furthermore, the structure-preserving transformations can be analyzed in terms of the 15 fundamental properties introduced in *TPoL*. As extended here, the 15 properties become **15 transformations**. Change that preserves wholeness is shown to be a product of transformation based on one or more of the 15 properties. Each transformation introduces, preserves, or strengthens one or more of the 15 fundamental properties. Again, one of the most useful things Alexander has done here is to provide good language, which makes good analysis possible.

Alexander points out, with multiple examples, that humans *can* build in this structure-preserving fashion, but usually *don't*. To do this, he juxtaposes traditional (or pre-modern) building processes with modern examples.

Humans seem to be attracted to old places. We visit New England, or Europe, to see *old* buildings, not modern ones. We have a sense that *old* cathedrals, *old* cities, are somehow richer than modern counterparts. Alexander contends that traditional building methods followed the structure-preserving process found in nature. For example, he presents a series of plans that show the development of

Amsterdam from 1400 to 1800. It is easy to see how the steady development process took *previous* development into account. Patterns that were latent in 1400 are realized in 1800, building shapes echo each other, the relationship of the town to the water is consistent throughout.

There is no sense of imposed planning—Amsterdam seems to have *grown*.

The structure-preserving process occurs in the modern world, but more rarely. Beginning about 1900, many forces—changes in banking, zoning, planning, architecture, etc.—began to produce **structure-destroying transformations**. The wholeness of an existing structure was no longer considered. A classic example is the extension of a freeway through an existing neighborhood. The freeway is designed and built *without reference* to its surroundings, and thereby *destroys* those surroundings. Similar examples can be cited *ad infinitum*: a skyscraper designed on one continent and built on another, a planned community laid out with equal precision on the drawing board and on the ground, a giant Wal-Mart box seemingly dropped from the sky onto its scraped pad... in every case, the previously existing whole is disregarded and destroyed.

Alexander uses these examples to define two kinds of structure: **generated** and **fabricated**. Generated structure creates life, and fabricated

structure, nearly always, creates... the opposite of life.

The discussion of generated structure begins with an analogy that struck me very powerfully. Consider a fairly complex origami construction. It is not built to a plan; that is, blueprints of the finished structure are not provided. Instead, a *sequence of steps* is provided. A plan of the figure would be quite complex—several pages at least. But a sequence—first do that, then do this—is relatively concise. This idea is then applied to the development of an embryo. DNA does *not* store a blueprint of the *exact* appearance of a

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particular animal, it stores a *sequence* of development which then takes place affected by attendant circumstances. Interestingly, this is proved by recent experiments in biology—cloned animals do *not* look exactly alike. Same sequence, different circumstances.

Compressed into a nutshell, Alexander's program for creating living structure is to generate a construction sequence that first, observes the whole, then, makes a change that preserves and enhances the whole while approaching the desired end state, then... repeats as needed. Or, in his more elegant language:

“A living process is any adaptive process which generates living structure, step by step, through structure-preserving transformations.”

These sequences can also be called **patterns**, harking back to Alexander's early book, *A Pattern Language*. Here, they emerge as part of a comprehensive program for reforming human construction methods. As argued, the case for reform is convincing and ultimately hopeful. After all, the remnants of tradi-

tionally built structures are solid evidence that humans *can* build in a living fashion. Some would argue that as a species we have been *unconsciously competent*, are now unconsciously incompetent, but are beginning to notice deficiencies—to be *consciously incompetent*. It certainly seems possible that the human capacity for self-observation must eventually lead to *conscious competence*, and to a beautiful living world.

PoCL is a massive book, totaling 635 pages with appendices and notes. The illustrations are copious and superbly complement arguments put forth. I

have, therefore, presented barely a skeletal outline of the book's full force, but I hope I have adequately suggested *that it is forceful*.

In some ways, Alexander is the living human I most admire. He has, after all, come by his ideas the old-fashioned way... he's earned

them. He has poured his life into his writing and philosophizing and then he has done something harder. He has, for decades, tested his philosophy, often in difficult conditions in the poorest regions of the planet. He is, simultaneously, an idealistic ivory tower dreamer and a pragmatic contractor; that dirt under his nails is a mix of grit and ink and it's been there for decades. When a man so rigorously tests his ideas in the real world, over such a span of time, and then adjusts his ideas to accord with the practical knowledge gained... well, he can't be lightly dismissed. *A*

Editor's Note: If you have enjoyed Stocking's writings on survey-related topics, you might be interested in his new book, *Everything is Somewhere*, a collection of his published and unpublished works in revised and expanded form, with new introductory material. It is being carried exclusively by Berntsen International, Inc. Sample chapters may be read at everythingis-somewhere.com.