

Editorial

It will perhaps come as no great surprise to scientists, resource managers, and superintendents of the National Park Service to learn that chaos is a fact of life.

What may be of interest, however, is the recent jelling of a suspicion that – like the word “magic” – the word “chaos” may simply be a convenient semantic designation for something we don’t yet understand.

In a new book titled *Chaos: Making a New Science*, (Penguin paperback \$8.95), James Gleick describes an “upstart new science” – the study of the circumstances that lead otherwise smooth, dynamic processes to disintegrate into chaotic, unpredictable behavior. According to Gleick, chaos theory can be applied to such diverse phenomena as weather prediction, cancer growth, heart attacks, and business cycles.

The science of chaos challenges two heretofore widespread scientific notions: the idea of *reductionism* (breaking the whole into pieces and assuming that the whole is the sum of the pieces), and the notion of *predictability*. The new science attacks reductionism by asserting that instead of acting independently, the various “pieces” of a system act on every other piece so that any change in any of the components will alter the system throughout. The notion of predictability had already been upended by quantum physics, which trashed forever the boast of 18th century philosopher/mathematician Pierre Simon de Laplace that given the position and velocity of every particle in the universe he could predict the future for the rest of time.

Real world situations are complex, and the interaction of a few of even the simplest of a system’s components can generate randomness and make prediction impossible. Ask any weatherman. The minutest of differences (sometimes referred to as “the butterfly wing effect”) will be amplified over time in unpredictable ways.

For those with a mathematical turn of mind, the consideration of fractals (which describe the nooks, crannies and twists of nature) as a tool in the new science will glue you to the pages of this book.

For those of a more philosophic bent, a prior reading of Fritjof Capra’s *The Tao of Physics* will suggest that perhaps randomness and chaos are only the three dimensional manifestations of a cohesive and orderly pattern that can express itself fully only in five, ten, or a thousand dimensions ... much as a closed circle that intersects a flat world at only two points as it completes its third dimensional loop would be seen by two-dimensional (flat world) creatures as two totally unrelated “holes in their world.”

Next time your star-gazing interpretive program is clouded out, or the campground plumbing fails, or your enclosure fencing is destroyed (the indoor flushing *won’t* go down the drain but your outdoor experiment *does*), try to think of it as a seemingly disorderly manifestation of an unfathomable order – *somewhere!*