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THE THOUSAND FACES OF COMPLEXITY

*Abstract*

Chaos is nowadays in fashion. Nevertheless, its success is based, indeed, almost entirely on the limitations it imposes to the predictive power of scientific theories.

But non-linear (chaotic) dynamics have a very important constructive role, too. In fact, they are suspected to give rise to the most part of interesting and complex (organized) objects.

In 1985 Charles Bennett, in a famous paper, analyzed the main definitions of complexity, pointed out they all were not adequate and proposed to characterize complexity in a new way, that he called “logical depth”.

In my paper I critically review Bennett’s arguments and point out that both his definition and the others subsequently proposed by various authors have some default and cannot be regarded as satisfactory, because none of them is able to discriminate between complexity and randomness on one side and “good” and “bad” complexity on the other.

For this reason, I suggest that complexity may be a (at least) bi-dimensional concept, having not only a “logical”, but also an “*ontological*” component, the veritable concept of complexity (that is “good” organization) being individuated by the resultant of these two components.