

The Nature and Meaning of *Information* in Biology, Psychology, Culture, and Physics

1. Introduction

This website is an evolving attempt to integrate the diverse concepts of information that have been developed in different branches of science and technology. This effort is based on the belief that a clearer understanding of concepts related to information may offer important scientific insights that are currently hindered by ambiguous terminology and vague concepts. The content of the website is frequently revised and updated. The date for the current version of a webpage is given at the bottom of each page.

Information and information processing, like air and breathing, are so pervasive and essential that we rarely notice or fully appreciate them. There are so many levels, types, and interactions for information processing that it is extremely difficult to grasp the full implications.

Concepts involving information play an increasing role in some of the most challenging problems in science. Two of the most profound mysteries in science are how life began and how quantum physics should be conceptualized. There are strong arguments that concepts of information will have a fundamental role in understanding these mysteries (Greenstein & Zajonc, 2006; Schlosshauer, 2007; Yockey, 2005).

However, the relevant writings reveal differing concepts, terminology, and assumptions in discussing information in different scientific contexts. These differences result in ambiguities and inconsistencies that hinder scientific understanding, particularly on a much-needed interdisciplinary level. For example, the different uses and implications of the term *information* in biology and physics are not widely appreciated.

The purpose of the present discussion is to summarize the concepts pertaining to information as these concepts are emerging in scientific research and to identify and understand the similarities and differences among the different scientific disciplines. This discussion may provide a basis for interdisciplinary insights about life, consciousness, creativity, and quantum physics.

References

- Greenstein, G., & Zajonc, A.G. (2006). *The Quantum Challenge: Modern Research on the Foundations of Quantum Mechanics* (2nd ed.). Sudbury, MA: Jones and Bartlett.
- Schlosshauer, M. (2007). *Decoherence and the Quantum-to-Classical Transition*. Berlin, Germany: Springer.

Yockey, H.P. (2005). *Information Theory, Evolution, and the Origin of Life*. New York: Cambridge University Press.

Next Section: [2. What is Information?](#)

© 2012 James E. Kennedy

[Version of 5/14/2012]

[Originally published on the internet on 5/10/2012 at <http://science.jeksite.org/info1/>]