

A Brief Examination of Information and Material Objects

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Abstract

An examination of “information” and “material objects” suggests they represent an intrinsic duality, at least with regard to our perceptual reality.

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Recently, the idea has been postured that “information” may be more fundamental, in a physical sense, than material objects.

We begin by asking the question: “What is information?” In the most general sense, information is *that which can be known*. As such, *that which cannot be known*, if such exists, *cannot* be considered information; in fact, we have no definition of what such might be.

Physics only concerns itself with that which can be known, and so physics is a study of information; that set of information then becomes knowledge. Since information can include abstractions which do not have any tangible existence but yet have physical meaning, such as mathematical concepts including negative numbers, limits, efficiency, and so forth, we can argue that physics involves the abstract as well as the tangible.

When we explore the same question regarding information as it applies to the nature of reality itself, we must ask *two* questions. The first is if all things that exist are real, and the second, pending that answer, is if there is anything which *is* real that *cannot* be known.

If we allow, for the moment, an answer to the first question being that all things existent are real by definition, then we recognize that if something is real *and* cannot be known, information alone cannot present a complete picture of the universe. On the other hand, if all things real can be known, then information alone can present a complete picture of the universe.

One potential way to address the first question is via definition – we could say that if something cannot be known, it simply does not exist. But clearly, this contrivance is both unsettling and unsatisfactory; the use of such semantic arguments to constrain scientific principles is hardly scientific. One may argue that the exact decimal value of PI cannot be known, in that the expected infinity of its precision can only be represented by a concept relating the diameter of an ideal circle to its circumference (or a numerically equivalent abstract mathematical function). Since a truly ideal circle can only be represented in mathematically abstract terms and cannot be manifest into a physical entity, this cannot resolve an exact physical representation of PI. The question then takes an important detour – if something is precluded from existing in the physical world due to its nature of abstraction, *and also* precluded from being known due to the incapability of information resolution, does such actually exist?

The problem with such definitions is that they, by their very state of being, present circular reasoning. This is because a definition is not a *quantity* but rather a *quality*. We know *exactly* what something “is” when we define it to be “that” thing; since “information” is simply an abstract concept, it is whatever we define it to be. That is, there is no “quantity” or “measurement” called “information,” it is an encompassing abstract state of knowledge – and, therein lies the confusion comprising the essence of why the question addressed in this paper was ever asked.

Information represents a set of knowledge concerning what we have defined and how we have defined it. If we make the conjecture that information *itself* has some fundamental existence, then we are forced to conclude, via the above discussion, that such existence is equivalent to those entities from which we discern the information. That is, in such a case one cannot have the information without the entities; likewise, such entities cannot exist without the requisite information, as the lack of such information storage would nullify their existence. We have therefore, a *duality* whereby one cannot have information without that which is providing the information, and by continuation of the conjecture, one cannot have something real that does not provide any information – at least not within the context of physics.

If we allow ourselves to consider that something may transcend what can be known, then physics itself is wholly unsuited to the context. For instance, physics cannot know an exact decimal value of PI because such cannot be known in its entirety; even though conceptually such an abstraction exists, and may be mathematically represented, it does not exist in a complete informational context. But, we can know approximations of PI which *are* real and *do* exist by physical definition, and these apply to the study of physics. Because physical ideals do not exist, we may say that all real things are approximations of their potential information, that information is globally incomplete, and that physics is largely the study of how such conceptual abstraction applies to recoverable information.

When we examine this in the greater context we recognize why the universe may be only approximately symmetrical, and in flux. Like the untenability of a statically balanced inverted pendulum, perfect symmetry is not physically realizable, at least not within our given “perceptual” reality. Anything may abstractly possess an infinite amount of information, including both infinite temporal and spatial precision, which must be truncated for it to exist in any tangible sense. By itself this suggests quantum behaviors at the most fundamental levels, given that the universe cannot provide infinite precision to an existent entity.