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Cosmos, Entropy, and Order: Speculations on the Basis of Ethics

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Dear Friends,

It is an honor and a privilege to have this opportunity to share with you a few thoughts. I am sorry that I cannot be with you in person and wish to apologize at the outset for this makeshift, homemade, at-a-distance video presentation.

Thank you to the organizers of this historic event, and a special thank you to my friend Dr. Sohan Lal Gandhi, whose tireless work for peace and for making the world a better place has been a long-time inspiration for me.

In my brief comments, I would like to try and link the concepts of order, entropy, sustainability, and ethics, and, in particular, suggest that the notion of order creation, as distinct from entropy, provides the basis for a universal ethics.

So, let us start with the "big picture":

Since 1990, when the Hubble Space Telescope was launched, our view of Universe has dramatically expanded both in distances and time.

For example, one of Hubble's most spectacular images, is known as "the Hubble Ultra Deep Field":

- It is the deepest we can penetrate back in time, going back some 400 million years after the Big Bang, well over 13 billion years ago.

- The image contains an estimated ten thousand galaxies within only a tiny fraction—13 millionth—of the area of the sky. It gives us a good sense of the immensity of our environment—this is our home!

- Such facts are significant as only recently, less than one hundred years ago, the prevailing scientific thinking was that the Milky Way, our own galaxy, comprised the whole Universe.

Hubble's images have revealed a reality of scale and complexity unimaginable only a few decades ago. But if we take a step back, and simplify the whole picture, we can distinguish two essentially different types of regions in our cosmic environment: regions where energy is being scattered and diffused, and regions where energy is being compounded and consolidated. The latter are the rare and special places where order and complexity emerge and evolve.

We can distinguish, then, between two major processes at play here—two sides of the same coin—processes of entropy increase (increase in diffusion and disorder) on the one hand, and processes of order creation, on the other.

Earth is clearly one such special spot, where order creation and the evolution of complexity are manifest. Here, the Sun's radiation, instead of simply dissipating, is captured and compounded to create order of increasing complexity: simple organic molecules; countless forms of life; whole ecosystems, including human society and its technological extensions; and human consciousness itself.

As human beings, in fact, we are a product of this process of order creation. What's more, we hold the potential to be agents of it—to consciously participate in this great unfolding—arranging, rearranging and optimizing cosmic building blocks in preferred configurations.

By virtue of mind, we humans are potentially a most potent agent for order creation. A potentially very powerful anti-entropic force, which, as some deep thinkers have suggested, may be the very reason for our existence in the first place. And yet, all evidence suggests that the cumulative impact of

human activity now threatens every major component of the biosphere, including the future wellbeing of our own species.

So, this is where we find ourselves. At this beautiful, fragile corner of Universe where complexity naturally springs and evolves. And with the potential to participate in enhancing it. But instead, we are doing just the opposite—compromising the very complexity upon which we depend. This is a critical issue that touches every one of us and will impact our children and their children. The future could be one of worsening deterioration on the one hand, or sustainability on the other. The choice of building a sustainable future is in our hands. This is our collective responsibility.

“Sustainability,” though, is a term that has been so overused, compromised and superficially applied, that it has all but lost its meaning. A rigorous, clear concept of sustainability should be rooted in the idea of a balanced interaction between a population and the carrying capacity of its environment. Any population and any environment: it can be amoeba in a petri dish, lions in the savanna, elephants in their habitat, or humans on the planet.

I have, accordingly, defined sustainability as follows:

“A dynamic equilibrium in the process of interaction between a population and the carrying capacity of its environment, such that the population develops to express its full potential without producing irreversible, adverse effects on the carrying capacity of the environment upon which it depends.”

It is precisely this equilibrium that has been compromised in our time by consuming resources at a faster rate than these can be replenished, and by overwhelming all parts of the biosphere with our waste byproducts, in quantities that far exceed absorption capacity. This is a powerful adverse trend that must be reversed. We need to collectively rethink everything as we reconfigure a saner trajectory for human affairs.

The point is that the wiring of our industrial civilization, as currently configured, is destructive, wasteful and largely entropic in nature. And war, of course, is a hugely entropic affair, which is why your work here at this gathering, enshrining peace and non-violent action, is so very important.

All the foregoing suggests that the concepts of order creation and entropy, and the contrast between the processes that they stand for, can provide the common basis, a firm foundation, for a universal understanding and definition of ethics. This is a very exciting possibility since it links physics and the second law of thermodynamics, information theory and its concept of order and organization, and ethics, the latter being commonly regarded as vague, context-specific, and open to interpretation—only partially relevant to realistic experience, and certainly not at the fore of guiding practical affairs.

It all boils down to one simple idea, an idea which calls on us to commit to always acting conscientiously and with deliberate intention, choosing our actions carefully and in such a way that they will contain rather than amplify entropy and enhance inclusive order in the world.

Processes of disintegration are obviously part and parcel of all living systems, but they function as part of a broader ecological balance. They become pathological when they start to dominate and take over.

All this should sound familiar. At the heart of all wisdom traditions you will find a consistent call and a prescription for taking the right path, for avoiding evil-doing and for seeking the wholesome and good. This is coupled with a view that characterizes so many traditions, of regarding personal and societal stages of development as forming a trajectory, moving from egocentric, greedy, predatory and limited preoccupations, to ever more inclusive, integrated, self-restrained, caring, and compassionate orientation.

These two groups of adjectives, you will recognize, ultimately describe qualities that tend to unleash and amplify disorder on one hand, or promote peace, harmony and wholeness on the other.

At the Sustainability Laboratory, incidentally, we try to internalize the concept of order creation in projects that implement radical, sustainability-related change. As, for example, in a project demonstrating an approach to reversing processes of desertification. A typical image of ducks swimming in a water pond—now common in winter on the project's arid site—would have been regarded as an inconceivable occurrence only a few years ago, when our site looked like a barren moonscape. Today it is green and teeming with life.

But let us take one more step in our journey together today. Underlying processes of order creation are forces that bind and cohere. Science recognizes four forces dominating the physical reality. These forces, that can attract or repel, include gravity, electromagnetism, and the so-called weak and strong forces that govern atoms and nuclear behavior. We should, perhaps, learn to add Love to the primary forces that keep things together.

My teacher and mentor, Buckminster Fuller, used to refer to “Love” as “metaphysical gravity.” Think about it, metaphysical gravity!

The combination of heart and mind, then, constitutes potentially the most powerful anti-entropic force. Science cannot yet deal with it, but Love may turn out to be the one force that underlies, drives and coheres the whole show.

Thank you. Enjoy a productive meeting and peace and blessings to you all.