

A CREATIVE AND MAGIC UNIVERSE

This morning I want to make three points. The first is to recall to you that there is a connection between the way in which science views the world and the answers which we can give to questions we usually call religious: for example, the meaning of existence or the place of humanity in the universe.

The second point is that the way in which science views the world has changed radically in the last fifty years. Science used to view the world in reductionistic terms, reducing the whole to the sum of the parts. Even though perhaps most scientists are unaware of it, it now looks at the universe as being holistic, the whole being greater than the sum of the parts. Indeed science views the universe as a magic place where the impossible comes true. Furthermore, science now believes the universe to be imbued with creativity and continually organizing itself into higher levels of being. So literally, the universe has to be called a creative and magic universe.

Then the third point is: given this new world-view, briefly and speculatively, what is the significance for the question of human existence.

To introduce the connection between science and religion, I want to give you a personal experience. A few years ago Genevieve and Elizabeth and I visited Istanbul and like most visitors to that city were charmed by the city and its inhabitants. Istanbul has a fine museum of Greek art, mainly sarcophagi, decorated with friezes of stone figures. They are from the Hellenistic period, say from 200 B.C. to about 200 A.D. The figures were usually full of grace and realism giving the impression of a people who loved life and nature. But from time to time one would come across figures which were rigid and primitive, a foretaste of the dark ages. This art always turned out to be later, no longer pagan but Christian. One could not help but ask why there had been this loss of beauty from the world, this impoverishment of art.

A reason for this has been given by a man called Hans Jonas who is an expert on the Gnostic religion, also a student of existentialism, and a biologist. He says that at this time a great change took place in the religions of the eastern Mediterranean world. This was a change from what he calls sacramental religions to salvational religions. A sacramental religion saw the meaning of life in a harmony between one's life here and now and the workings of the universe around us. Sacraments of the religion had the goal of reinforcing the feeling of harmony. On the other hand, a salvational religion looked to the salvation of the individual in a supernatural revelation, or in an afterlife. The meaning of life was found outside the universe, and not inside it, as with the sacramental religions.

So, why was there this change from sacramental to salvational religion at about 0 A.D.? (The Christian religion was of course

such a salvational religion) . Greek science viewed the universe as a cosmos, meaning a thing of beauty, a harmony or an ordered whole, an organism in fact. The Greek city state was another cosmos, another ordered whole in which each individual found his place. It was easy to relate to the universe because you already related to your city-state. . However, around 0 A.D. the Greek city state disappeared and was replaced by cities with large masses of population in which the individual was lost. According to Jonas, the link to the universe was broken, and the scientific background for religion disappeared. So, sacramental religion was replaced by salvational. With the change-over came a loss of interest in art and in the beauty of everyday things. So, in the Istanbul museum, it is probable that I was seeing indirect evidence of the influence of science upon religion.

My second and main point this morning is that the scientific world view has changed from that of the nineteenth century and it would now seem to be sympathetic to a rational religion like Unitarianism and to a reasoned answer to questions about the meaning of life. I would like therefore to describe the changes which have taken place in the scientific world-view, these changes being described in a new book by the British science writer Paul Davies, entitled "The Cosmic Blueprint". This is a successor to his "God and the New Physics" which we have in the church library. But it goes very much further than "God and the New Physics".

What we usually take to be "scientific" and "common-sense" is in fact nineteenth century science. This is typified by classical physics---mechanistic, reductionistic and deterministic. In it phenomena are reduced to the movement of and interaction between particles, viewed as hard balls bumping into one another. The new world-view is typified by quantum physics, developed during the twenties and thirties but whose implications are only now becoming apparent. The most characteristic chapter of quantum physics is the EPR Paradox . Einstein is the E in EPR, and he first drew attention to what appears to be mental telepathy between particles. Einstein conceived of an experiment in which two particles interact and then separate to a great distance, so far apart as to preclude any material influence one on the other. Nevertheless the quantum theory says that the two particles remain a single whole because they have once interacted. It predicts that a measurement on one of the particles should affect the outcome of a measurement on the other. The particles engage in a conspiracy to cooperate in giving a combined answer to the experiments even when the measurements are made simultaneously. Thus Einstein's disgusted exclamation that this was mental telepathy between the particles, and since he could believe in mental telepathy, quantum theory could not be correct. But in fact quantum theory and mental telepathy between particles has been shown to be correct by numerous experiments. David Bohm, a quantum theoretician, has gone further than other scientists in exploring the implications of this mental telepathy between particles or non-locality as it is called in physics. David Bohm gives the following statement of

the present picture of the physical world: " one is led to a new notion of unbroken wholeness which denies the classical analyzability of the world into separately and independently existing parts. We have reversed the usual classical notion that the independent elementary parts of the world are the fundamental reality and that the various systems are merely collections and arrangements of these parts. Rather we say that inseparable quantum connectedness of the whole universe is the fundamental reality, and that the independently behaving parts are merely particular and contingent forms within this whole." The present picture of the universe is therefore radically holistic rather than reductionistic, and it has inspired many physicists to draw parallels between this picture of the universe given by physics and that given by Buddhist and Hindu writings.

Part of the picture given by modern physics concerns the place of consciousness in the universe. Without going into details, both quantum physics and cosmology give an exalted place in the universe to consciousness, even going so far, in what is known as the Anthropic Principle, to find that the universe is programmed to produce consciousness. A physicist, Richard Schlegel, once wrote an article in Zygon, a journal devoted to the interrelation between science and religion, and started by Unitarians. He entitled his article "how Science stole Religion's Patent on Magic". So this is the first adjective which we can apply to the present universe, that it is a magic universe.

Now, although it is admitted that the quantum world may be one of odd happenings and magic, it is usually felt that the magic fades when we leave this peculiar microscopic world and enter the macroscopic world of ordinary things the same size as us. But apparently this is not so, and this is the topic of the new book by Davies, the Cosmic Blueprint, of which the subtitle is "New Discoveries in Nature's Creative Ability to Order the Universe". This appears to be the new perception of the universe -- that it is a creative universe as well as being a magic universe. Here I want to refer to the title which Charles gave for his sermon this morning, i.e. Life against Entropy. Entropy in science is a grandiose name for disorder, and in nineteenth century physics the universe is condemned to ever-increasing disorder until finally at the state of maximum disorder, or maximum entropy, all further process ends. The only way to escape from this fate is to export disorder or entropy outside of oneself. This is what living systems do. They take in ordered material of low entropy and excrete disordered material with high entropy. They maintain themselves without running down. But the cost of this is polluting the rest of the universe with their high entropy. Hubert Reeves, the French-Canadian astrophysicist says that the universe is the garbage-can of the planet. Unfortunately, the universe as a whole has nowhere to export its entropy to, and so entropy should accumulate through the universe until finally all processes will stop, the universe drowning as it were in its own entropy pollution. So, until recently physics imagined that in the beginning the universe was highly organized, but from then on it would continually run down like a clock, finally arriving at the state of maximum entropy.

The key new feature which contradicts this is the expansion of the universe . This means that the universe effectively has the possibility of exporting entropy to the far confines of the universe, hence any part of the universe is no longer doomed to ever-increasing entropy. In fact, the universe, far from being organized at the beginning and then running down, was apparently incredibly simple at the moment of the Big Bang, and since then it has been becoming more complex, and more organized . As each level of organization is created by the evolving universe, Davies sees emergent properties and laws which have no counterpart in the lower level of organization. This feature constitutes a negation of reductionism since the properties of the higher level, although they are not in contradiction with the lower level, are not explained by it. The analogy Davies returns to many times is the software-hardware analogy. For instance this church has a computer . The wires and chips are the hardware which runs in accordance with the laws of physics. At the same time it is programmed by soft-ware which has nothing to do with physics, but which was made up by Charles or somebody to do the accounting , or the mailing or whatever. In no sense can the laws of accounting , or the soft-ware of the computer be said to be explained by the laws of physics which rule the electrons running through the wires of the computer. So, the higher level, for instance the mind, i.e. the soft-ware, is not explained by the lower level, the brain, i.e. the hardware. Finally, recent research has shown how the behaviour of complex systems is no longer determined, and instead shows creativity. Perhaps I had best quote the dust-jacket of the book. "Davies argues that all matter and energy have the ability to self-organize according to common holistic principles. Examining these principles, Davies suggests that the universe develops toward progressively higher levels of complex self-organization-- from the pattern of a snowflake to the structure of organisms ,to "the cosmic blueprint" governing the entire structure of the universe." This is indeed a creative and a magic universe.

For my third point, it is obvious that there are many points of contact between religion and this new scientific world-view conclusions. First, it would seem that it is better to live in a magic universe than in a dull and pedestrian one. The important characteristic of holism is certainly sympathetic to many trends in the modern world. The new world-view suggests that the reality is not independent particles interacting in a rather superficial way , but rather that the very interaction or relation between the particles brings their fundamental properties into being and makes them different from what they otherwise would be. Now, when the particles are human beings, then we call this constitutive relation love. We also know from the book by Carol Gilligan, In Another Voice, which Charles talked about some years ago , that women tend to put more importance on relations whereas men value more principles and hard facts. We can then perhaps say that a knowledge of the universe will favour feminism, and perhaps also a greater realization of interdependence in world affairs and in the environment .

Second, it is clear that Whitehead and process theology, which is the dominant theology of the Unitarian movement, is right. There is a creative urge underlying the universe, which could be called god. But it is not something which as it were predates the universe. Davies starts his book with a quote from the chemist Prigogine: "God is no more an archivist unfolding an infinite sequence he had designed once and forever. He continues the labour of creation throughout time." Or a quote from Whitehead: "God is in the world, or nowhere, creating continually in us and around us. This creative principle is everywhere, in animate and inanimate matter, in the ether, water, earth, human hearts." I would count myself a humanist, and I don't think that humanists should find these statements disappointing. Humanists, I believe, criticize revealed religion, particularly when it is authoritarian. Whether creativity in the universe is called just that or God does not seem to make much difference, as long as it is recognized as a supremely important principle underlying the universe.

Davies, himself, on the last page of his book:

"The knowledge that our presence in the universe represents a fundamental rather than an incidental feature of existence offers, I believe, a deep and satisfying basis for human dignity" And a few lines further down: "I believe that science is in principle able to explain the existence of complexity and organization at all levels, including human consciousness though only by embracing the higher-level laws. Such a belief might be regarded as denying a god, or a purpose in this wonderful creative universe we inhabit. I do not see it that way. The very fact that the universe is creative, and that the laws have permitted complex structures to emerge and develop to the point of consciousness--in other words, that the universe has organized its own self-awareness-- is for me powerful evidence that there is "something going on" behind it all. The impression of design is overwhelming. Science may explain all the processes whereby the universe evolves its own destiny, but that still leaves room for there to be a meaning behind existence. "