THE LAST FRONTIER OF PHYSICS

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We have no doubt that we are all conscious human beings. We are acutely aware of our environment as well as of ourselves. We are pretty sure that many animals also may be conscious to certain extent. Apes and cats and dogs may not have a sense of self, but they certainly experience pain and pleasure. Some dogs even flaunt their arrogance! What about smaller creatures like ants and mosquitoes? Are they conscious of themselves or are they driven simply by instinct alone? We think that plants do not possess a mind; however, we notice that they can respond to their environment. But we take it to be almost sure that stones and rocks and tables and chairs do not possess any consciousness.

These are well known facts and we consider them as a part of the commonsense. However beyond a point commonsense can become deceptive and lead us to some kind of incorrect impressions far from reality. Hence commonsense is no sure guide for understanding the world. The one phenomenon in this world that is so impervious to our understanding is "consciousness" itself. How can some strange biochemical processes taking place within the gray matter of our brain give us the experience of joy, pleasure and anguish, happiness or boredom? This is much more than a mere biological problem and it has been attracting the attention of scientists, computer specialists, psychologists and philosophers at various times from Aristotle and Adisankara to Dalai Lama.

In spite of all the ingenuity and depth of human thinking, the problem of consciousness has eluded any clear answer and many thinkers have been desperately seeking solutions in areas beyond Physics. Many argue that perhaps 'mind' is not limited to brains of some animals. It is ubiquitous and must be present in every bit of matter, all the way upto galaxies and all the way down to electrons and photons. Medium sized things like a piece of stone or a jackfruit need not be excluded from this all pervading mind, which is omnipresent. It is obvious that matter, which we generally consider as inconscient, has certainly got the potential to become conscious; otherwise we will not be here to ask this question on consciousness. It is not an accident occurring on a planet when suddenly it got into the right configuration and condition for the emergence of life and mind, rather, there must have been consciousness in the cosmos from the very beginning of time.

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Panpsychism is the doctrine that the stuff of the world is fundamentally mind-stuff. This idea is very old and we can see it explained in great details by the ancient sages of India like *Vasishta* (in the text *Yogavasishtam*) and *Sankara*. In modern times Sir Arthur Eddington dealt with such an idea using the concepts of post relativity and quantum theory. A few decades ago the American philosopher Thomas Nagel showed that it is an inescapable consequence of some very reasonable premises. First our brains consist of material particles like atoms, molecules and neurons. Second these particles, in certain arrangements, produce subjective thoughts and feelings. Third, physical properties alone cannot account for subjectivity. How could the ecstatic sensation of smelling a jasmine could ever arise from the equations of physics? Now, Nagel reasoned that the properties of a complex system like the brain cannot just pop up into existence from nowhere; they must arise from the properties of that system's ultimate constituents. Those ultimate constituents must therefore have subjective features themselves i.e. features in the right combinations, add upto our inner thoughts and feelings. But the electrons, protons and neutrons making up our brains are no different form those making up the rest of the world. So the entire universe must consist of small, small bits of consciousness. Even before the period when the constituents of the atom were known, in the pre-independent India, Sri Aurobindo (see, the book 'The Life Devine') made almost similar arguments and arrived at the same conclusions. Of course Aurobindo was guided by the teachings of the *Upanishads*, although he uses rational arguments and modern language.

In recent times, the Australian philosopher David Chalmers as well as the Oxford physicist Roger Penrose are of the opinion that panpsychism has to be given some serious consideration. Sir Penrose does not hesitate to point out that consciousness is something, which exists in the quantum domain. In other words subjectivity has an essential 'other worldliness' character. A recent book by the British philosopher "Consciousness and Its Place in Nature" discusses the theme of panpsychism and rebuts most of the criticism against it. Some people are a bit skeptical to the idea that small bits of mind-dust, with their presumably simple mental states, combine to form kinds of complicated experiences that the humans have. However this is not inconceivable since we are familiar with the phenomenon of crowd mentality where many minds in a place put together decide the crowd psychology. It is indeed difficult to prove scientifically that a piece of stone has emotions. It is equally difficult for you to prove that the pain experienced by your colleague when he gets his fingers jammed in a door gap is any more 'real'.

If we consider ourselves as self-replicating chemical structures, then for successful continuation of our replication we have to gather information from the surroundings and act on this. Brain is an essential component for this purpose and we believe that it is the most intricate thing in the universe. It is the seat of all our pain and pleasure, love and hatred, passion and happiness. Being made with matter, can we any longer look down on brute matter without some admiration? Undoubtedly the architecture beneath simple looking matter conceals much more than what meets our eyes.

Let us consider the piece of rock shown in the photo. To our gross perception it does not appear to be doing anything in particular. But at micro level it consists of an

unimaginable number of atoms connected by springy chemical bonds having electrons, all jiggling around at a rate that even our fastest supercomputer will utterly fail to follow. In fact the particles are not jiggling at random. The rock's innards see the entire universe by means of gravitational and electromagnetic signals it is continuously receiving. It is very well linked with the universe outside. Such a system can be viewed as an all-purpose information processor like our brain with many sequences of mental states. And where there is information, there is consciousness. According to David Chalmers, "experience is information from inside; physics is information from outside"

But the rock does not exert itself as a result of all this 'thinking'. Its existence, unlike ours, does not depend on the struggle to survive and self-replicate. It is in a total meditative state. It is indifferent to the prospect of being pulverized. As the writer Jim Holt says in his new book on the Puzzle of Existence, you might draw the moral that the universe is and has been saturated with 'mind' of its own, even though we snobbish Darwinian-replicating latecomers are too arrogant and blinkered to notice it. But as the descendants of a great tradition, we Indians can be proud of the fact that this is the first and the most important truth, which the ancient *Rishis* of this land pointed out.

Rocks in Meditation