

Letters

Questions without answers

The questions raised in "The Quantum Universe: A Zero-Point Fluctuation" (SN: 8/3/85, p. 72) are fascinating to discuss, to speculate about, to nibble at either mathematically or theologically. We are mistaken, however, and perhaps arrogant, if we assume that they have answers. Paradoxes such as what lies beyond the end of everything are not resolvable.

*Phyllis Cohen
New York, N.Y.*

Your article on cosmology states that physics restricts itself to the material. The concept of material versus nonmaterial is, in an important sense, a denial of the right of scientific inquiry and should be opposed by the scientific community.

The philosophy of a nonmaterial or supernatural component of the universe postulates one or more entities which obey either no rational laws or different laws and which are not subject to scientific inquiry. However, the salient difference between the material and nonmaterial is not an intrinsic difference, as it might seem, but only a difference in the amount of inquiry allowed.

Contemporary physics serves up a panoply of bizarre and unnatural laws, including unpredictability (no law), and all manner of infinities and extranormal entities — entities beyond the wildest ideas of the ancient religions. No concept can be found in the nonmaterial universe that fundamentally differs from those of the material universe, save the right of inquiry. We are not to ask the mass of God. It is not a question of zero mass or infinite mass or unknown mass or indeterminate mass; it is simply that we aren't to ask such things. Do we not owe it to the Galileos of history to reject this limitation?

*Adam L. Carley
Atkinson, N.H.*

I read with amusement "The Quantum Universe." Rather than having the view that the universe is "so large," I have felt that it must be infinitely small, with a fleeting existence — nothing more than a subatomic particle of something greater. Obviously, one's viewpoint colors one's analysis and perspective. Without question, the jury is still out. Keep me posted!

*Perry J. Radoff
Houston, Tex.*

"The Quantum Universe" brought back to me a view I have had for some time that the universe has to be quantum mechanical at all levels and size has nothing to do with it.

The confusion comes when we think that the state of macroscopic objects can be exactly measured independent of quantum mechanical considerations. Assume I become interested in measuring the speed of automobiles going continuously by on a roadway. I could paint a white stripe on the road and, at a measured distance away, paint another stripe. I could then deduce speed by simply measuring, as accurately as possible, the time at which an auto entered the first gate and exited the second.

However, following the dictates of operationism, I could only presume the auto is somewhere between the gates during this operation. I can propose nothing more legitimately about its location than that. In fact, I cannot believe it has any specific position between the

gates at any time during the operation.

If I wish to fix its location more accurately, I could narrow the distance between the gates and exclude a certain range of locations from consideration. If I continue far enough in this way, I can fix its location with precision (say, within the length of the car itself) only at the expense of determining its speed. With precision in location, the car might appear to be standing still for a very brief instant, yet have all sorts of momentum and force connected with it.

I take from this that macroscopic events cannot be said to have simultaneous location and speed any more than an electron can; that, in fact, they are not real except when observed. Even macro reality must be a quantum state that is nonlocalized in space and time until we make an observation on it. From this, it is not difficult to believe that a wave equation could describe the large-scale universe, although the way to it is not clear. Large-scale nature is a magician: She misdirects us into believing that her possessions have inherent motions, velocities, etc., that are carried with them. I think such a view is as inaccurate as one stating that the tabletop upon which I now write is somehow solid.

Modern physics assumes that large-scale reality is subject to quantum mechanical considerations because its substrate is indeterminate, but that of itself, it is largely Newtonian (or Einsteinian). It seems to me that large-scale reality is inherently quantum mechanical, and that is physics' modern revelation.

By the way, I also think that motion (of objects) is an illusion similar to the solid tabletop, but that is another letter.

*Thomas F. White
Wichita, Kan.*

Clear-water contamination

The questions raised in "The Trouble With Tracking Turbidity" (SN: 7/6/85, p. 4) are valid. Turbidity was a good approach in the days when microorganisms were the major cause of disease in drinking water. And the efficiency of filtration has increased to the point where we need a new measurement for the effectiveness of water treatment.

However, as much as microorganisms may affect the aesthetics and healthfulness of drinking water, we also need to look at chemicals and chemical combinations. A city like New Orleans, which is at the bottom of a long tunnel of petroleum- and chemical-processing factories on the Mississippi River, may have perfect drinking water according to the EPA. Yet there could be effluvia lurking in the water that are not counted under EPA guidelines, and that would hence be invisible to any proposed examining standard. Furthermore, we know very little about the interactions of waste dumped from different sites.

The carcinogenic effects of these chemicals, and of their recombinations in the rivers and lakes, may be only long-term cancers (colon, liver, kidney) that are currently attributed to other environmental factors.

We need to look further into the effects of waste dumpage, and the interactions of these wastes, if we are to achieve purer drinking water for our cities and rural areas.

*Luke McGuff
Minneapolis, Minn.*

Books

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New Hope for Binge Eaters: Advances in the Understanding and Treatment of Bulimia—Harrison G. Pope Jr. and James I. Hudson. Explains bulimia, the syndrome of compulsive binge eating followed by purging, and answers questions for some of those who suffer from the disorder. Offers a detailed description of new studies in which bulimia has been linked to depression and bulimia sufferers have been treated with anti-depressant drugs. Originally published in hardback in 1984. Har-Row, 1985, 239 p., paper, \$5.95.

Out of This World: An Illustrated Guide to Space Technology and Exploration—Marshall Cavendish Editorial Board. In text and illustration this book explores the wonders of the universe from black holes to the moon. Examines space technology and considers the future in space, from mining and building to living in space. Arco, 1985, 121 p., color/b&w illus., \$14.95.

The Penguin Encyclopaedia of Nutrition—John Yudkin. Nutrition is viewed here not simply as a description of protein, vitamins and minerals and their effects in the body but as the total relationship between people and their food. The entries include food rationing, dental decay and food preservation, along with amino acids, lactose intolerance, obesity and absorption. Viking Pr, 1985, 431 p., illus., \$20.

Quantum Reality: Beyond the New Physics—Nick Herbert. Discusses eight major theories about the nature of the universe, each presenting a different model of the way the world operates. Evaluates each theory in light of Bell's theorem, which says that "the act of measurement is . . . a public event in whose details large portions of the universe instantly participate." Bell's theorem, the author feels, has important consequences for all models of quantum reality. Doubleday, 1985, 268 p., illus., \$16.95.

The Quest for SS433—David H. Clark. A fascinating account of how the author, along with several other prominent astronomers around the world, discovered this bizarre stellar object. Goes on to tell what has been learned about this celestial phenomenon. Viking Pr, 1985, 206 p., illus., \$15.95.

Reversing Africa's Decline—Lester R. Brown and Edward C. Wolf. A broad-based effort to restore and preserve environmental support systems—forests, grasslands, soils and water resources—is essential to reversing environmental deterioration and economic decline in Africa, says this Worldwatch Institute study. Some of the necessary strategies are highlighted in this report. Worldwatch Inst, 1985, 81 p., paper, \$4.

Time Frames: The Rethinking of Darwinian Evolution and the Theory of Punctuated Equilibria—Niles Eldredge. "That evolution occurs no biologist worthy of the name doubts," says the author, "[b]ut many biologists these days do openly wonder how complete and accurate our grasp of the mechanics of the evolutionary process really is." This is the story of punctuated equilibria—what the theory is, how it came to be and what the author thinks it means to modern evolutionary thinking. S&S, 1985, 240 p., illus., \$16.95.