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of Bell's theorem is that it offers a way to give people who don't know anything at all about quantum mechanics a simple explicit illustration of just what it is that makes quantum correlations so striking. The "quantum prejudices" I asked people to put aside were not prejudices about how the world behaves, but prejudices about what is or is not remarkable.

As one who let his *Scientific American* subscription lapse when Martin Gardner retired, I'm delighted to have enlightened him on what Bell's theorem is all about, but with parlor games like the one he proposes, he's going to have trouble getting anybody to attend his parties.

I applaud Kenneth Ekstrand's insight into the pernicious influence on the development of physical intuition of an early exposure to peek-a-boo. He has a profound point. My own view is that there *is* a real problem, but that the answer to the problem is to be sought not in a better understanding of the physical world, but in a better understanding of how we seem to have to think about that world.

I believe we should all be grateful to Andre Mirabelli for bringing to our attention John Donne's spiritual brother Howsit and his school of Quantumphysical Poetry.

And, finally, I would like to note that Jack Sarfatti wrote me to say that he is the author of the communication I cited from the California think-tank director to the undersecretary of Defense for research and engineering. I am glad to acknowledge the original source.

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Nuclear power plant accidents

Barbara G. Levi presented a concise overview of some current problems in nuclear power plant regulation in her article, "Radionuclide releases from severe accidents at nuclear power plants (May, page 67). A few of the statements in this otherwise excellent article are either incorrect or likely to be misinterpreted by your readers, however, and should be clarified.

The statement "Most current regulations rely on a slight modification of that source term—100% of the noble gases, 50% of the iodine and 1% of the remaining fission products" appears in the midst of a discussion of severe accidents. The stated composition, however, is the fission-product release assumed to be dispersed in a containment building as a means of assessing the adequacy of that building's design

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and standoff distances to the off-site public. This composition is not a source term and does not correspond to the expected releases from a severe accident. Indeed the assessments that are made assume that only off-site releases, or source terms, that occur are from low-leakage paths and do not result in major health impacts. Most regulations require nuclear power plants to be designed, built and operated in such a way as to prevent releases and to retain any release that might occur, and the quoted composition is used to enforce those regulations. A severe accident is an event that surpasses the required capabilities of the plant.

Levi also cited the large "dose–conversion" factors of the refractory fission products, typified by lanthanum, as the reason the APS study group devoted especial attention to their potential release. This is not true, as the dose–conversion factors (the ionization densities in human tissue per curie of isotope) of the refractory elements are no larger than those of other fission products and much smaller than some iodine and strontium isotopes. The refractory elements deserve consideration simply because there is so much of them in the core inventory. As used in severe accident studies, the "lanthanum group" of refractory elements includes all elements having very stable refractory oxides, and 0.1% of this group is a much larger fraction of the mass and radioactivity of the core than 4% of the iodine. In addition, it is the dose received by the human thyroid gland as a result of inhaling and absorbing iodine that is of relative importance, and not the whole-body dose that was compared in Levi's excerpt.

Doses from noble-gas fission products can be received only from radiation emitted in the surrounding air, while the refractory oxides can deliver radiation from deposited aerosol particles inside and outside the body long after gaseous releases have diffused or blown away.

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Conceptual understanding

Lillian C. McDermott has considered some important problems in her article, "Research on conceptual understanding in mechanics" (July 1984, page 24).

I have argued (November 1983, page 111) that high-school pupils know neither Aristotle nor Newton but simply have the tendency to establish the relationship between the cause and effect. So the persistence of Aristotelian thinking is natural.

In case of the swinging pendulum, perceiving a force in the direction of motion is not surprising. On the contrary, it is consistent with our assumption that the unbalanced sine component of the weight (that is, $mg\sin\theta$) acts as the restoring force.

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'Physics News in 1984'

In his item, "Reconnection of Magnetic Field Lines," in "Physics News in 1984" (January, page S-50), N. C. Luhmann claims that "associated with the reconnection in both solar flares and magnetic substorms is a transfer of magnetic field energy into heating and directed particle energy."

This should be compared with the statement in a monograph authored[1] by Larry R. Lyons and Donald J. Williams: "It remains to be shown that field line interconnection can directly transfer energy from the magnetic field to charged particles (field line merging, reconnection) or that plasma turbulence effects are important as acceleration processes."

In my judgment, the Lyons and Williams version is the correct one. They could have safely added that this will never be shown because it is in conflict with elementary laws of physics. This is easily understood if we calculate the electric current (by taking the curl of the merging magnetic field) and depict the current system. This demonstrates that the transfer of field energy to the acceleration of particles is not a *local* process (except in special cases) but a *global* phenomenon, which makes it necessary to include the whole region where the current flows. (I have treated[2] this subject in my monograph *Cosmic Plasma* and in a number of papers.)

References

1. L. R. Lyons, D. J. Williams, *Quantitative Aspects of Magnetospheric Physics*, Reidel, Dordrecht, Holland (1984), p. 4.
2. H. Alfvén, *Cosmic Plasma*, Reidel, Dordrecht, Holland (1981).

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THE AUTHOR REPLIES: The basis for Alfvén's disagreement with my article describing the elegant pioneering basic laboratory studies of R. L. Stenzel and W. Gekelman on magnetic field line reconnection processes appears to be based solely on the sentence that he