moral aspect of quantum mechanics."[3] In particular, Nauenberg's comment that "experiments have revealed that the nature of reality in the quantum world is different from our experience in the classical world" is, in my opinion, the lesson we have to learn from Bell inequalities.

I do not appreciate so much Nauenberg's example of the helium atom since it distracts from the issue of nonlocality. In fact, it is at macroscopic distances where the "puzzle" arises and not at atomic distances of separation.

I have a confession: I am not the realist one might expect after reading Bell's article "Bertlmann's socks and the nature of reality"; the world in its very foundations is much more abstract than we think with our *"anschauliche"* (intuitive) concepts, to borrow Werner Heisenberg's term. My personal feeling is that Bell's theorem, which reveals an apparent nonlocality in nature, points to a more radical conception whose onset we do not yet have.

References

1. J. S. Bell, *Speakable and Unspeakable in Quantum Mechanics*, 2nd ed., Cambridge U. Press (2004), p. 67.
2. R. A. Bertlmann, *J. Phys. A* **47**, 424007 (2014).
3. J. S. Bell, M. Nauenberg, in *Preludes in Theoretical Physics in Honor of V. F. Weisskopf*, A. De-Shalit, H. Feshbach, L. Van Hove, eds., North-Holland (1966), p. 279.

Reinhold A. Bertlmann
(reinhold.bertlmann@univie.ac.at)
University of Vienna
Vienna, Austria

"Salty" conversation

The "Salty solutions" Quick Study by Greg Thiel (PHYSICS TODAY, June 2015, page 66) was encouraging for the progress it described in desalinating seawater by reverse osmosis (RO). There is, however, some confusion with the thermodynamics. Thiel does recognize that not all kilowatt-hours are created equal, and the electrical energy (work) to drive the RO pump is the highest-grade energy, as compared with the low-grade heat that drives an evaporative process. He lists energies for RO in kWh_e (kilowatt-hours of electrical work) per cubic meter of fresh water and compares that with the kWh_e of heat required for thermal evaporation processes, but there is no specified conversion or equivalence factor. Is it based on the Carnot equation (for an assumed temperature difference) or on some practical thermodynamic cycle such as Rankine? A conversion factor is fundamental if the reader is to make any useful comparison.

Permit me also to raise a practical point. We generally use an engine, a water or wind turbine, or a photovoltaic array to generate electricity, whereas heat is readily available from solar thermal collectors or geothermal sources. Some may even be virtually free, such as waste heat from another process or industry. The economic choice, therefore, between RO and thermal evaporation may not always favor RO despite its numerically lower kWh_e input number. The decision would properly depend on the forms of energy available to a particular desalination plant.

In no case other than a survival emergency would it make sense for either process to run on fossil-fuel combustion, since the resulting carbon dioxide emissions would only exacerbate the climate change that is often at the root of the drought that the desalination plant is supposed to alleviate.

Jonathan Allen
(rfguy13@comcast.net)
RF Electronics Consulting
Titusville, New Jersey

■ **Gregory Thiel presents** an informative look at the technology and economics of seawater desalination through reverse osmosis. California, evidently, is