Readers offer their own magic moments with John Bell

The article "Magic moments with John Bell" by Reinhold Bertlmann (PHYSICS TODAY, July 2015, page 40) was very enjoyable to read. As a research student in nuclear physics, I was fortunate to spend my final year, 1959–60, in the theoretical physics division at the UK Atomic Energy Research Establishment at Harwell, where I had my own "magic moments." Nominally, my supervisor there was Tony Skyrme, the brilliant inventor of a soluble field theory; skyrmions have had many applications in solid-state physics. However, I learned much more from conversations with John Bell.

In particular, during my career in research, I have tried to follow John's advice to construct the simplest possible model to deal with a problem. During that year at Harwell, many researchers in nuclear physics were trying to formalize an optical model potential that included the antisymmetry of nucleons in its derivation. As a referee of those attempts, John had constructed a simple model to test their validity. I recall that Herman Feshbach was among the several authors for whom John was able to point out where their derivation failed.

In the theoretical physics tearoom, John loved interacting and arguing with his colleagues—arguments he pursued totally without rancor. When someone voiced an opinion, he would sometimes express a contrary view just to enjoy an argument. That once upset a rather staid member of the division when John suggested that her desire for a pay increase was contrary to his view that those, including her, who loved their work should be paid less than those who did not.

John's presence at divisional seminars could be a serious trial for the visiting speakers, as both he and Skyrme were prone to question the basic equations they presented. I felt sorry for one speaker on numerical weather forecasting who was asked about the derivation and validity of the equations he was using. The ensuing discussion turned into one mainly between John and Tony as to whether the approximations used were justified.

I have always thought that John would have been an excellent teacher in a university and an inspiration to research students. It is good to know, however, that in addition to me, others enjoyed magic moments interacting with him.

Charles Clement
(charles.clement@btinternet.com)
University College London

■ **Here are some memories** of my own "magic moments" with John Bell. I first met John in 1962, when I spent a sabbatical year at CERN from MIT. We had fruitful discussions on longitudinal sum rules arising from moments of the density–density correlation function in *N*-body systems, which were later incorporated into my book on statistical mechanics.[1]

The second time I saw John was in 1964, I think, at the physics summer school at the University of Washington in Seattle. Rudolf Peierls was also present, and the three of us discussed a question I brought up: why a point source of light on a lake shore produces a point image in calm water but a long pencil of light when there are ripples. We did not reach a conclusive answer.

On a weekend trip, I drove John and his wife, Mary, to visit Olympic National Park in Washington State. Coming back from a rest stop, John reported that a group of children had pointed at his beard and said, "Look! Hippie! Hippie!" John said children learn things fast because "childhood is boring." We talked about various subjects on that trip. He was a vegetarian because of Mary, but one time on the road he had no choice but to stop at McDonald's for a hamburger. "It was delicious," he said.

At the Pacific Ocean shore in the park, John decided he had to take a dip. We both waded in but could only stay a few minutes because the water was very cold. When we walked back to the car, there was another car beside mine, and an elderly couple had gotten out, apparently waiting to speak to us. The wife said that they saw the MIT parking sticker on my car; did I happen to know their son, a senior in physics at MIT? His name is Ising. I said, as a matter of fact, I did know a student named Ising. And she said, "This is my husband, Dr. Ising. He teaches physics at the Central College in Peoria, Illinois. Have you heard of the Ising model?" I said, "Of course! I wrote a textbook with a chapter devoted to it." Dr. Ising was diffident and embarrassed.

Reference

1. K. Huang, *Statistical Mechanics*, 2nd ed., Wiley (1987), sec. 13.7, app. A.4.

Kerson Huang
(kerson@mit.edu)
Naples, Florida

■ **I greatly enjoyed** reading Reinhold Bertlmann's article "Magic moments with John Bell." Sprinkled with levity, it discussed Bell's life, work, and outstanding insights and achievements in the foundations of quantum mechanics (QM). In my view, the reading should also make one acutely aware that scientists, despite our expectations of them, are sometimes still prone to the same failings that beset the rest of humanity.

Bertlmann outlines very nicely Bell's theorem and inequalities and the consequences of their violation; that work led to the subsequent startling experimental results on "entangled" quantum mechanical states, which, Bertlmann writes, showed "that nature contains a nonlocality in its structure." Nonlocality, in Bell's conception of it, is clearly a violation of special relativity (SR), so we have a problem. The startling thing for me is that Bell actually does appear to solve the problem, at least in principle, but at the same time he seems afraid to say so and, in fact, distances himself from the proposed solution.

The essence of his ambivalence is conveyed in the following paragraph, quoted by Bertlmann:

> It may be that we have to admit that causal influences *do* go faster than light. The role of Lorentz

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