

In this explosive Middle East conflict, in addition to worrying about potential future nuclear threats from countries like Iraq, shouldn't we worry even more about existing nuclear threats from countries like Israel?

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8/81

Quark theory

In the news report entitled "Gambling with a theory of quarks" in October (page 18), it was reported that the challenge in quantum chromodynamics is to bridge the gap between the long-range interaction where quarks are confined and the short-range interaction where the theory is considered to have predictive power. It was widely claimed in the past few years that the observation of three-jet events in electron-positron annihilation is a strong support for the validity of the short-range interaction of quantum chromodynamics.¹ However, it turns out that the configurations of hadrons produced in electron-positron annihilation are very similar to the configurations of hadrons produced in high-energy proton-proton collisions²; this observation implies that three-jet events are as prominent in proton-proton collisions as in electron-positron annihilation. Since the three-jet events in proton-proton collisions have a large production cross section typical of the size of ordinary strong interactions and the three-jet events do not necessarily contain large-transverse-momentum hadrons, they must be considered the result of the long-range interaction. This, of course, casts doubts on the claim that three-jet events in electron-positron annihilation are the evidence of the short-range interaction of quantum chromodynamics; actually three-jet events in electron-positron annihilation are known to be generated from other more conventional sources³.

Under this kind of uncertainty about the applicability of the short-range interaction of quantum chromodynamics, the urgent task in quantum chromodynamics is to find exact solutions of the theory and check such exact solutions against the vast amount of accumulated data on the long-range interaction to fulfill the claim that quantum chromodynamics is indeed the theory of strong-interaction dynamics. Only after this progress is made, can the exact solutions be extended into the supposed short-range interaction region to see whether or not the quark-gluon coupling really decreases. There is no definite reason to believe at this stage that the short-range interaction of quantum chromodynamics is real-

ized in nature; it is a property of the theory of quantum chromodynamics if and only if the quark-gluon coupling is assumed to be weak in a certain region to begin with.

References

1. R. Brandelik *et al.*, Phys. Lett. **86B**, 243 (1979); Ch. Berger *et al.*, Phys. Lett. **86B**, 418 (1979); D. P. Barber *et al.*, Phys. Rev. Lett. **43**, 830 (1979); W. Bartel *et al.*, Phys. Lett. **91B**, 142 (1980).
2. M. Basil *et al.*, Phys. Lett. **95B**, 311 (1980); Lett. Nuovo Cimento **29**, 491 (1980).
3. C. K. Chen, Phys. Rev. D, **23**, 712 (1981); Phys. Rev. D, **23**, 2068 (1981).

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12/82

Astronomer identified

The photo at bottom left on page 14 in November shows Edwin Hubble and an unidentified astronomer at the 100-inch telescope. This unidentified astronomer is Sir James Jeans, a British astronomer.

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2/82

Units of frequency

I concur with James Rainwater (September, page 15) that the use of hertz to indicate cps is pretty silly. I have seen it spelled "hurts," which seems appropriate. Hertz had no ability to measure frequency. He did measure wavelength. It is *not* the same thing.

If someone is to be honored, we should select a suitable person who did contribute to measuring frequency. I would suggest Huygens for pendulum clock, or Cady for crystal oscillator.

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1/82

The boojum still again

In the April 1981 issue (page 46), David Mermin gives an account of how the word "boojum" became an accepted scientific term. According to Mermin, the term "boojum" is from Lewis Carroll's "Hunting of the Snark."

Mermin wonders why "boojum" suggested "softly and suddenly vanishing away to Carroll." I wish to point out that Lewis Carroll lived at a time when there was a great deal of interest in oriental, and especially Indian literature and philosophy. In Sanskrit and other Hindu languages, *poojyam* or *boojyam* stands for that which is worshipable. Interestingly the same word also stands for zero or emptiness, as a result of associating mystical qualities to zero.

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