cal sense—for purposes of illustration rather than with realistic intent; that he proceeded in the early 1860s to develop a substantial commitment to the realistic status of a particular mechanical model of the electromagnetic field, based on the idea of "molecular vortices" in the medium pervading space; and that subsequently, in the mid-1860s, he began a measured retreat from his realistic commitment to the molecular-vortex model, without ever completely giving it up.

The extant record of this intellectual journey provides material that can be used to support a wide variety of historical conclusions through selective quotation. Good practice in historical writing, however, demands, above all, balance, and it is this that is lacking in Tolstoy's presentation. His reporting that Maxwell viewed one part of the molecular-vortex model as "awkward" and "provisional," while neglecting to tell the reader that Maxwell viewed another part of the model as a "probable" hypothesis, is just one example of this lack of balance. The quotation with which Tolstoy closes his letter provides another example. For balance, it should be accompanied by the preceding paragraph in Maxwell's *A Treatise on Electricity and Magnetism* (3rd edition, 1891, reprinted by Dover, New York, 1954):

> I think we have good evidence for the opinion that some phenomenon of rotation is going on in the magnetic field, that this rotation is performed by a great number of very small portions of matter, each rotating on its own axis, this axis being parallel to the direction of the magnetic force, and that the rotations of these different vortices are made to depend on one another by means of some kind of mechanism connecting them.

To quote Maxwell's reservations concerning the possibility of specifying the mechanism connecting the ether rotations, while entirely neglecting the neighboring passage expressing his continuing commitment to the basic hypothesis of rotating parcels of ether, does not make for good history. It is only when the two passages are put together that one gets a balanced picture of Maxwell's final stance with respect to the molecular-vortex model, and the general conclusion toward which the combined passages point is that Maxwell remained basically within the mechanistic camp, although with significant reservations.

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Physics-information group?

In November 1984 the council of The American Physical Society approved the formation and operation of topical groups with the purpose of supplementing areas of physics not encompassed by one of the society's divisions. A topical group may be established by the council upon petition by 20 members of the society.

I would like to hear from APS members who might be interested in forming a physics-information and documentation topical group whose purpose would be to further the generation, organization and dissemination of physics information. Meetings and programs of the topical group would be held at least annually, possibly in conjunction with the regular APS meetings.

Those physics-information specialists, physics librarians and other APS members interested in forming a topical group should contact me at the address given below.

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Aharanov–Bohm effect

I enjoyed very much the commendable story by Bertram Schwarzschild on the Aharanov–Bohm effect (January, page 17). Just a month earlier, in the same column, he treated us to a magnificent description of Klaus von Klitzing's discovery of the quantized Hall effect. Although the results sought after are quite different, I could not help speculating on the similarities between these two experiments:

- ▶ Both theories are built on the fundamental "flux quantum" h/e, where h is Planck's constant and e is the charge of the electron.
- ▶ Both theories predict magnetoresistance oscillations with increasing magnetic field occurring with a flux periodicity of h/e.
- ▶ The two experiments were carried out in crossed magnetic and electric fields similar in magnitude and geometry.
- ▶ Both devices may be considered "mesoscopic": One has a diameter of 1 micron while the other has an effective width of 50 microns.
- ▶ The two experiments were performed at low temperatures of the same order of magnitude.

The most remarkable comparison is that the materials and the shapes of the devices are quite dissimilar: One is a

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gold ring, while the other is a metal–oxide–semiconductor strip. While the Aharanov–Bohm effect manifests itself as a shift in an interference pattern, the Hall effect displays a quantized conductivity. Obviously these experiments describe two different effects. The question uppermost in my mind is, are these two effects the result of the same fundamental law of nature, *the physical existence of the magnetic vector potential*? From this point of view it appears reasonable that the same effect is found in two totally dissimilar objects. A universal law should be independent of material or configuration.

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Physicists' terminology

The terminological error Veit Elser attributes to physicists (PHYSICS TODAY, May, page 120) is shared by lexicographers. *Webster's Unabridged Dictionary* (the revered 2nd edition) defines "finite" to mean "neither infinite nor infinitesimal." So does the *Oxford English Dictionary*.

This raises the interesting question of why, in spite of being "universally surprised," we "universally acknowledge the incorrectness of this choice of words" when Elser challenges us.

My guess is that we are seduced into acquiescence by a taste for simple logical paradoxes, a reluctance to consult authorities when we can figure something out for ourselves and an unwillingness to acknowledge that language (and life) are governed by laws somewhat murkier than nature's. Or is it just another tribute to Elser's charm and powers of persuasion?

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Polarized scattering

In your August 1985 Search and Discovery story on polarized scattering (page 17), Stanley Brodsky is quoted as saying, "We have absolutely no explanation for the Krisch data." While it is true that quantum chromodynamics offers no explanation, there are other theories that offer some explanation. In 1964, François Lurcat wrote[1] an article entitled "Quantum field theory and the dynamical role of spin." I quote from his abstract:

> The point of view currently taken in elementary particle physics, that the spin plays no dynamical role, is criticized here. This assumption has no experimental ground; it is merely a consequence of the wave equation used, especially in field theory.

The Krisch data show that Lurcat was correct to question the assumption. The wave equation used depends on the group assumed to underlie the physics. The group used in QCD, namely SU(3), is far too small to give a wave equation with dynamical spin. The group Lurcat uses is too small to give the strong interactions. The first theoretical question to answer, then, is "What is the correct group?"[2]

Many very interesting theoretical papers have been written since 1964 on the subject, and the interested reader should refer to the *Science Citation Index*.

References

1. F. Lurcat, Physics (NY) **1**, 95 (1964).
2. T. R. Love, Int. J. Theor. Phys. **23**, 801 (1984).

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Capping research overhead

I was gratified to read, in a recent issue of *The New York Times*, that the Federal government is planning to put a cap on university overhead rates on research grants and contracts. I have advocated such a course of action for the last ten years. To reimburse universities for all overhead costs incurred merely penalizes efficient university administrations that have kept overhead costs down while rewarding the most inefficient universities and encouraging them to incur still more costs. If this step had been taken voluntarily by the research community, the savings might have been made available for the direct costs of research. Now they will merely go toward reducing the Federal deficit. More cost cutting will still be needed. Now that the bureaucratic budget-cutters in Washington have noticed "overhead," it is only a matter of time before they discover "summer salaries."

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Physics classroom revisited

I wish to compliment George Pallrand and Peter Lindenfeld on their article

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