Editorial: Memorable papers from the *American Journal of Physics*, 1933–1990

In an earlier editorial, "Vote for your favorite AJP papers" [**57** (12), 1067 (1989)], I invited readers to nominate their favorite papers from past issues of this Journal, from the first issue in Volume 1 (1933) to the present. I wanted to be able to encourage all readers to seek out stimulating articles they might have missed or that they might have read a long time ago but forgotten in the intervening years.

The "AJP All-Star Team" is listed below. The chosen papers are simply arranged chronologically and grouped by year, except for cases in which several papers obviously belong together. Citations are given in the form recently adopted for this Journal, with both final and initial page numbers and—in particular—*titles* of the published articles. We have made one *addition* to the usual format for printing journal references, by including the *issue number*, in the hopes of making it easier for readers who may have unbound sets of AJP conveniently at hand. In all cases in which I happened to know about subsequent errata or sequels, I have added appropriate references but no systematic search has been made.

I decided not to try to group these papers by subject category for two reasons. First, because of the nature of this particular Journal, it would have been an impossible task. There was, however, a second and more important reason. To segregate the papers by subject matter would have run contrary to the spirit of this effort. For there was an implicit assumption behind my decision to print such a list, the assumption that AJP readers are a peculiar lot, with broad interests and eclectic tastes. (Does that really make us "peculiar"? I hope that all physicists fall into that category, but I sometimes worry that during the past few decades the percentage of physicists who fit that description may have been decreasing.) In my own case, for instance, though electromagnetic theory is still my own first love, I would not think of scanning a list like this looking only for papers on that topic. Rather, to quote from the one sentence in our current "Statement of Editorial Policy" that I think best summarizes the purpose of AJP, I would look for papers that meet my "needs and intellectual interests," in a broad interpretation of those words.

It is clear that nominations were made for a variety of reasons. Some may have been chosen in part because of the names of the authors. (Look, for instance, at the papers near the beginning of the list written by Condon, Bridgman, Morrison, Compton, Weisskopf, Wigner, Sommerfeld, Fermi, and Purcell.) Some were perhaps chosen because of the quaintness of their approach or a sense of "déja vu all over again" in Yogi Berra's immortal words. (See, for instance, Daffin, 1937 or Pake, 1961.) Some were chosen because of the important role that the particular papers played in an individual's own education. As any reader of my August, 1988 editorial, "Wanted—Tutorial articles for the *American Journal of Physics*" [**56** (8), 681 (1988)] might have predicted, I myself nominated Pake's 1950 papers on nuclear magnetic resonance, papers that can still serve as a useful introduction to that subject. Some papers were nominated that are not yet venerable enough to be "classics" but are obviously meeting the *current* needs and intellectual interests of readers: look, for instance, at Purcell, Mills, Janot *et al.*, and Washburn (1989); Dehmelt (our "Nobel Prize paper"), Dyson, Mermin, and Greenberger *et al.* (1990). (Careful readers of published dates of receipt and acceptance will realize that Dehmelt's paper was received in this office a few days prior to the announcement of his Nobel Prize award, hurried with unusual speed through the review process after the prize was reported, and published much more quickly than is normally possible, so that it appeared in print almost simultaneously with the ceremony in Stockholm.)

Here is one small statistical note for those interested in the sociology of science. The great majority (about 84%) of the listed papers were written by a single author, with an average of approximately 1.2 authors per paper. In the physics community at large, these numbers may seem bizarre, but they are not absurdly anomalous in the *American Journal of Physics* context. Of all new manuscripts submitted to AJP during the last three years, 65% were written by a single author, with an average of approximately 1.5 authors per paper. Think what the corresponding numbers are for other physics journals!

I want to thank everyone who nominated papers for this list; perhaps I owe a special word of thanks to those anonymous voters who were kind enough to nominate a few of my own old contributions to these pages! Happy reading.

Robert H. Romer, *Editor*

1934

E. U. Condon, "Where Do We Live? Reflections on Physical Units and the Universal Constants," **2** (2), 63–69 (1934).

1937

W. V. Houston, "The Physical Content of Quantum Mechanics," **5** (2), 49–55 (1937).

John B. Daffin, "Why the Woman Student Does Not Elect Physics," **5** (2), 82–85 (1937).

1939

P. W. Bridgman, "Society and the Intelligent Physicist," **7** (2), 109–116 (1939).

1941

P. Morrison, "Introduction to the Theory of Nuclear Reactions," **9** (3), 135–162 (1941).

Donald R. Hamilton, "Molecular Beams and Nuclear Moments," **9** (6), 319–337 (1941).

1942

Arthur H. Compton, "War Problems of the Physics Teacher," **10** (2), 92–96 (1942).

E. U. Condon, "A Physicist's Peace," **10** (2), 96–97 (1942).

1943

V. F. Weisskopf, "On the Theory of the Electric Resistance of Metals," **11** (1), 1–12 (1943).

Arnold Arons, "Toward Wider Public Understanding of Science," **41** (6), 769–782 (1973); **42** (2), 157–158 (1974).
Frank S. Crawford, "Water-Wave Machine for Demonstrating Group Velocity," **41** (10), 1203–1204 (1973).
Frank S. Crawford, "Coille Effect: A Manifestation of the Reversibility of Light Rays," **41** (12), 1370–1371 (1973).

1974

Claus Jönsson, "Electron Diffraction at Multiple Slits," **42** (1), 4–11 (1974).
Frank S. Crawford, "Singing Corrugated Pipes," **42** (4), 278–288 (1974).
Julian Schwinger, "Precession Tests of General Relativity—Source Theory Derivations," **42** (6), 507–510 (1974).
Julian Schwinger, "Spin-Precession—A Dynamical Discussion," **42** (6), 510–513 (1974).

1976

Leon H. Fisher and Robert N. Varney, "Contact potentials between metals: History, concepts, and persistent misconceptions," **44** (5), 464–475 (1976).
Allan Franklin, "Principle of inertia in the Middle Ages," **44** (6), 529–545 (1976).
Thomas F. Jordan, "Conditions on wave functions derived from operator domains," **44** (6), 567–570 (1976).
R. J. Higgins, "Fast Fourier transform: An introduction with some minicomputer experiments," **44** (8), 766–773 (1976).
Luis W. Alvarez, "A physicist examines the Kennedy assassination film," **44** (9), 813–827 (1976).
Edward MacKinnon, "De Broglie's thesis: A critical retrospective," **44** (11), 1047–1055 (1976).

1977

E. M. Purcell, "Life at low Reynolds number," **45** (1), 3–11 (1977).
E. R. Harrison, "The dark night sky paradox," **45** (2), 119–124 (1977).
E. M. Lifshitz, "L. D. Landau's plain talk to students of physics," **45** (5), 415–422 (1977).
J. Als-Nielsen and R. J. Birgeneau, "Mean field theory, the Ginzburg criterion, and marginal dimensionality of phase transitions," **45** (6), 554–560 (1977).
Banesh Hoffmann, "Unexpected rewards," **45** (9), 787–794 (1977).
Hans C. Ohanian, "What is the principle of equivalence?" **45** (10), 903–909 (1977).

1978

Michael Nauenberg and Victor F. Weisskopf, "Why does the sun shine?" **46** (1), 23–31 (1978).
P. Kittel, W. R. Hackleman, and R. J. Donnelly, "Undergraduate experiment on noise thermometry," **46** (1), 94–100 (1978).
Frederik J. Belinfante, "Can individual elementary particles have individual properties?" **46** (4), 329–336 (1978).
Timothy H. Boyer, "Electrostatic potential energy leading to an inertial mass change for a system of two point charges," **46** (4), 383–385 (1978).
E. J. Konopinski, "What the electromagnetic vector potential describes," **46** (5), 499–502 (1978).
Sidney D. Drell, "When is a particle?" **46** (6), 597–606 (1978).
Humphrey J. Maris and Leo P. Kadanoff, "Teaching the renormalization group," **46** (6), 652–657 (1978).
Albert A. Bartlett, "Forgotten fundamentals of the energy crisis," **46** (9), 876–888 (1978).
Lorenzo J. Curtis, "Concept of the exponential law prior to 1900," **46** (9), 896–906 (1978).
R. A. Powell, "Photoelectric effect: Back to basics," **46** (10), 1046–1051 (1978).

1979

Fritjof Capra, "Quark physics without quarks: A review of recent developments in *S*-matrix theory," **47** (1), 11–23 (1979).
Timothy H. Boyer, "Electrostatic potential energy leading to a gravitational mass change for a system of two point charges," **47** (2), 129–131 (1979).
M. V. Berry and N. L. Balazs, "Nonspreading wave packets," **47** (3), 264–267 (1979).
Evelyn Fox Keller, "Cognitive repression in contemporary physics," **47** (8), 718–721 (1979).
A. B. Arons, "Basic physics of the semidiurnal lunar tide," **47** (11), 934–937 (1979).
Mark A. Peterson, "Dante and the 3-sphere," **47** (12), 1031–1035 (1979).

1980

L. Basano and A. Bianchi, "Rutherford's scattering formula via the Runge–Lenz vector," **48** (5), 400–401 (1980).

1981

Allan Franklin and Howard Smokler, "Justification of a 'crucial' experiment: parity nonconservation," **49** (2), 109–112 (1981).
Barry R. Holstein and Arthur R. Swift, "Elementary derivation of the radiation field from an accelerated charge," **49** (4), 346–347 (1981).
P. C. Peters, "Where is the energy stored in a gravitational field?" **49** (6), 564–569 (1981).
K. Moriyasu, "Gauge invariance and hidden symmetries," **49** (9), 819–826 (1981).
R. H. Dicke, "Interaction-free quantum measurements: A paradox?" **49** (10), 925–930 (1981).
N. D. Mermin, "Bringing home the atomic world: Quantum mysteries for anybody," **49** (10), 940–943 (1981).
Stephen Gasiorowicz and Jonathan L. Rosner, "Hadron spectra and quarks," **49** (10), 954–984 (1981).
Robert H. Romer, "Motion of a sphere on a tilted turntable," **49** (10), 985–986 (1981).
H. Richard Crane, "Short Foucault pendulum: A way to eliminate the precesson due to ellipticity," **49** (11), 1004–1006 (1981).

1982

M. Danos, "Bohm–Aharonov effect: The quantum mechanics of the electrical transformer," **50** (1), 64–66 (1982).
Thomas D. Rossing, "Chladni's law for vibrating plates," **50** (3), 271–274 (1982).
Richard H. Price, "General relativity primer," **50** (4), 300–329 (1982).
William M. Fairbank, Jr. and Allan Franklin, "Did Millikan observe fractional charges on oil drops?" **50** (5), 394–397 (1982).
Frank S. Crawford, "The hot chocolate effect," **50** (5), 398–404 (1982).
Frank S. Crawford, "Elementary derivation of the magnetic flux quantum," **50** (6), 514–516 (1982).
Robert Weinstock, "Dismantling a centuries-old myth: Newton's *Principia* and inverse-square orbits," **50** (7), 610–617 (1982).