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Relativity theory was introduced to the western world through Eddington's brilliant grasp of differential geometry, leading from Gauss, Riemann, Weyl to Einstein, and his successful test of the deflection of light. His contributions were equally important to bring an understanding of the dynamics of stellar systems. And, what is mainly remembered, he laid the groundwork for the theory of the internal constitution of the stars, with an understanding of the mass-luminosity relation. Apart from these scientific contributions we know Eddington's merit in helping the friendship of scientists withstand the hatred flaming up during World War II. Many a university town owes being spared destruction during the war through the intervention of a few courageous and human-hearted scientists, Eddington one of them.

The scientific controversy discussed by Kameshwar Wali (October, page 33) is part of regular scientific life. The author presented this episode in history in a disproportionate manner. The really significant part of this piece is a quotation from Chandrasekhar: "It was easy to disagree with him [Eddington] on scientific matters. You can always be certain that he would never misjudge you or think ill of you on that account."

HERBERT JEHLE
University of Munich
12/82 *Munich, West Germany*

THE AUTHOR COMMENTS: I would like to thank Herbert Jehle for pointing out that in this centennial year of Eddington's birth, we must remember his great contributions to astrophysics, General Relativity, his humanism, and his internationalism in science. Who can forget his extremely moving obituary note [*Observatory* **39**, page 336 (1916)] about Karl Schwarzschild (an enemy scientist?)

However, I do not agree with Jehle that what transpired between Chandrasekhar and Eddington is a *part of regular scientific life.* There was another streak to Eddington's personality which reveals itself, not only in this controversy, but also his controversies with James Jeans and E. A. Milne. I have ventured to discuss this, not with the intention of discrediting Eddington, but to emphasize the human aspects of science which one should be aware of—the role of prestige and authority, subjectivity, and so on. Eddington, who had once said that in science "there is a kind of sureness which is not cocksureness," was increasingly becoming cocksure in his scientific thinking in the 1930s. This affected not only his scientific creativity, but because of his established reputation, influenced a great deal the thinking of others. Is it not ironical that Eddington could have, but did not, entertain the possibility of gravitational collapse, existence of black holes, and much other work in astrophysics involving General Relativity in the thirties? These problems were completely within the range of his interest and capabilities.

KAMESHWAR C. WALI
Syracuse University
12/82 *Syracuse, New York*

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Wali's account of the Chandrasekhar–Eddington confrontation was fascinating to read. But some slip-ups in basic astronomy caught my eye. The word "comes"—Latin for "companion"—is not unique to Sirius; it is a now-obsolete term used to indicate the faint component of any double star. Sirius B (as the white-dwarf companion of the Dog Star is most commonly known) is also called the "Pup" in popular literature. And Sirius' absolute magnitude of +1.4 makes it some 25 000 times dimmer than the intrinsically most luminous star in our galaxy. Of course, Sirius remains the brightest star in our nighttime sky.

LEIF J. ROBINSON
Editor
Sky & Telescope
11/82 *Cambridge, Massachusetts*

Stop the MX

The MX missile system is unnecessary and destabilizing. This conclusion does not rest solely upon the vulnerability of the proposed dense-pack basing mode.

The accuracy and kilotonnage of the MX warheads make them useful for a preemptive strike upon the land-based nuclear forces of the Soviet Union. This threat to the survivability of the Soviet nuclear deterrent will inspire the Kremlin to seek countermeasures. A likely response is to put Soviet missiles in a launch-on-warning mode. This means that Soviet missiles would be launched upon a warning that a nuclear attack is in progress. The warning would be provided by computers. Our NORAD computers are known to give frequent false warnings. It is safe to assume that Soviet warning systems are at least as fallible. Thus, the chance of a nuclear war beginning by accident is increased enormously.

Due to the large number of warheads per missile, the MX is an attractive target for the Soviets. Unless it is deployed in a manner that convinces the Kremlin that it is invulnerable, the existence of the MX increases the incentive for a Soviet first strike. At least thirty basing schemes have been examined, and none of the land-based schemes among them is widely believed

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to be invulnerable. It is ludicrous to allocate money to procure the missile with the thought that a sensible basing mode will be found.

Let us not delude ourselves; the onward march of technology is making the land-based nuclear missile vulnerable—and there is no acceptable technological fix. Let us not despair; our submarine-based nuclear forces offer sufficient destructive capacity to deter the Soviets from starting a nuclear conflict. Thus the MX is unnecessary. Our security would actually be decreased by its deployment.

It is argued that our participation in the Strategic Arms Reductions Talks (START) will be useless unless the MX goes ahead. It is fallacious to believe that we must be in a position of strength to negotiate. If this is true, then once we are in a position of strength the Soviets will not be able to negotiate.

Our President named the MX the "peace-maker." The "peace" the MX is likely to "make" is an eerie grey lifeless silence following nuclear war.

JOHN MATTOX
Stanford University
12/82 *Stanford, California*

Correction from India

In September (page 89) we were happy to read that the Oppenheimer prize had been jointly awarded to Maurice Goldhaber and Robert Marshak.

In this report, however, there is one inaccurate statement to which I wish to draw attention. Marshak visited our institute, Matscience, as the Niels Bohr Visiting Professor in 1963 and not Madras University as stated in the report.

N. R. RANGANTHAN
Matscience
11/82 *Madras, India*

Political letters

This is to praise PHYSICS TODAY for printing "gross politically motivated letters" such as those maligned by William Ember (August, page 13) and J. B. Hatcher (November, page 105). Such expressions not only enhance the excellence of this scientific publication, but I for one find them more interesting than letters that leave "scientific purity" intact. Certainly Reagan's program affects research budgets and thus is a legitimate topic of debate among physicists. Likewise, the plight of counterparts abroad is a valid concern. Also, physics has much to do with the arms race, appropriate technology, the energy issue and other public controversies. So, physics and "politics" overlap; indeed, about half of the news in PHYSICS TODAY falls under "State and Society."

As for which opinions get published, it is not a matter of First Amendment rights, but simply the judgment of the editor. Readers offended by a letter ought to skip it, as Allan Kiron (August, page 13) suggests—consoling themselves with the fact that other subscribers are not so gullible as to believe everything appearing in this column.

WILLIAM E. DEAN
University of Texas
1/83 *Austin, Texas*

Trap correction

The photographs (page 50) of three barium ions, two ions and of a single ion (figure 4), which were supplied by me to Arthur Schawlow upon his request, show the ion(s) confined in an electrodynamic or Paul trap. This trap features no magnetic field, but instead a (quadrupolar) radiofrequency field, in contrast with a Penning trap (mistakenly identified in the caption). The experiments to which these pictures pertain were performed by W. Neuhauser, M. Hohenstatt and myself, in collaboration with Hans Dehmelt, at the University of Heidelberg, Heidelberg, Germany.

PETER E. TOSCHEK
University of Hamburg
1/83 *Hamburg, West Germany*

Call for papers

Low-temperature applied physicists interested in cryogenic materials are probably unaware of a relatively new conference: The International Cryogenic Materials Conference, an interdisciplinary conference of interest to materials scientists with backgrounds in physics, chemistry and engineering. In its fourth year, the conference this year will be held in Colorado Springs, 15–19 August. We are especially interested in papers on the cryophysical properties of materials, such as the electrical, magnetic and thermal properties of metals, alloys, semiconductors and insulators for low-temperature applications. Submit 200–400-word summaries and 50-word abstracts by 1 March 1983 to me at the address below.

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