letters

should not be confined to the internal affairs of The American Physical Society. After all, it is in society at large, which serves as the source of new physicists, where implicit limitations on the career roles and goals of women exist.

The American Physical Society can promote its goals most effectively in society at large, by example and by exerting economic pressure. At the very least, future candidates for election to the Council ought to state their position on this question.

ROBERT J. RUBIN
National Bureau of Standards
Washington, D.C.
4/17/78

Hertzsprung–Russell Diagram

David DeVorkin's article, "Steps toward the Hertzsprung–Russell Diagram" in March (page 32) conveys the principal results of his penetrating examination of spectral classification and stellar evolution at the turn of the century. His researches demonstrate the power of using manuscript material of the sort that is now being widely gathered for more recent astronomy and physics by the Niels Bohr Archives at the American Institute of Physics.

In passing, two small errors in his article should be corrected. Harlow Shapley, the first graduate student of Henry Norris Russell, carried out the 10 000 binary star observations for his thesis at the Princeton Observatory, and went to Mount Wilson only subsequently. Mrs Fleming's system of spectral classification, using the Harvard letters but not the numerical subclasses, was published in the *Draper Catalogue of Stellar Spectra*. Draper's first name is reserved for Annie Cannon's *Henry Draper Catalogue of Stellar Spectra*, whose first volume was issued just sixty years ago in 1918.

The nine main volumes of the HD contain 225 300 stars, with numerical subclasses, arranged in the order OBAFGKMRNS. For several years I have held an annual mnemonic contest in my Natural Science class at Harvard. Among the most memorable entries are "Oh bring a fully grown kangaroo, my recipe needs some" and "Oh brutal and fearless gorilla, kill my roommate next Saturday."

OWEN GINGERICH
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Cambridge, Mass
4/6/78

New public interest

As one who is about to make a career change into physics, I have some thoughts to share with the community. These perceptions are gleaned from eight years in the Unitarian Universalist ministry. (I will begin doctoral work in physics at the University of Texas this fall.)

Much of the following of pseudoscience cults results from a sincere desire to understand reality; much of the new found popularity of science fiction stems from a rebirth of wonder. Capra's physico-mystical *The Tao of Physics* is but the latest in a tradition that includes Heisenberg, Einstein and Schrödinger. But this time the readership is *much* larger and broader. Straightforward popularization of science, particularly cosmology, is generating increasing interest from the public.

In short, it appears that society at large is beginning to develop an interest in science apart from that in the "Golden Age," when the goose laid technological marvels daily. As the bases of culture shift, new worldviews form that may or may not incorporate respect for science and its results. Needless to say, a constituency of support among the public would not hurt research funding.

If the physics community responds in an affirming way to this interest, the results might again prove our projections wrong. Pleasantly so.

ADRIAN L. MELOTT
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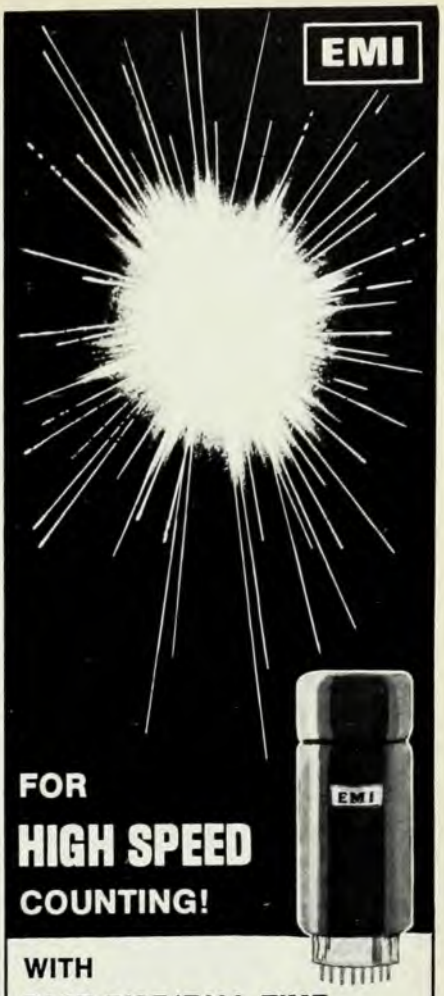
Austin, Texas
4/20/78

Radio program on cosmology

On 7 March there was a benchmark radio program on cosmology broadcast over KGO San Francisco, a major AM radio station owned and operated by the American Broadcasting Companies, Inc. Listeners were able to talk by phone to Grant J. Mathews of the Lawrence Berkeley Laboratory, who was at the station, and to Dietrick Thomsen, Senior Editor of *Science News*, who was on a phone patch from his home in Washington, D.C.

The purpose of this program was to demonstrate to the management of the major electronic media that science is just as interesting to the general public as the other subjects that regularly obtain exposure in that media, a hypothesis I had advanced to some ABC executives one night over cocktails. That hypothesis was not contradicted. There was much interest in the program, which ran longer than the scheduled one hour because of the large public response. The reader might be surprised to learn that this interest included, but was not limited to, the obvious subjects, such as the Jupiter effect and interstellar travel. There was equal public interest, for instance, in the concept of "finite but unbounded" spacetime. Moreover, Mathews and Thomsen did an excellent job of explaining such mathematically sophisticated ideas in lay language, at least to the es-

continued on page 74



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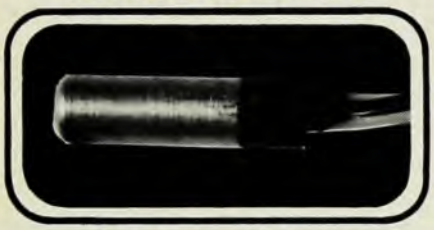

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letters

continued from page 15

sential point of stimulating and encouraging public interest in modern science.

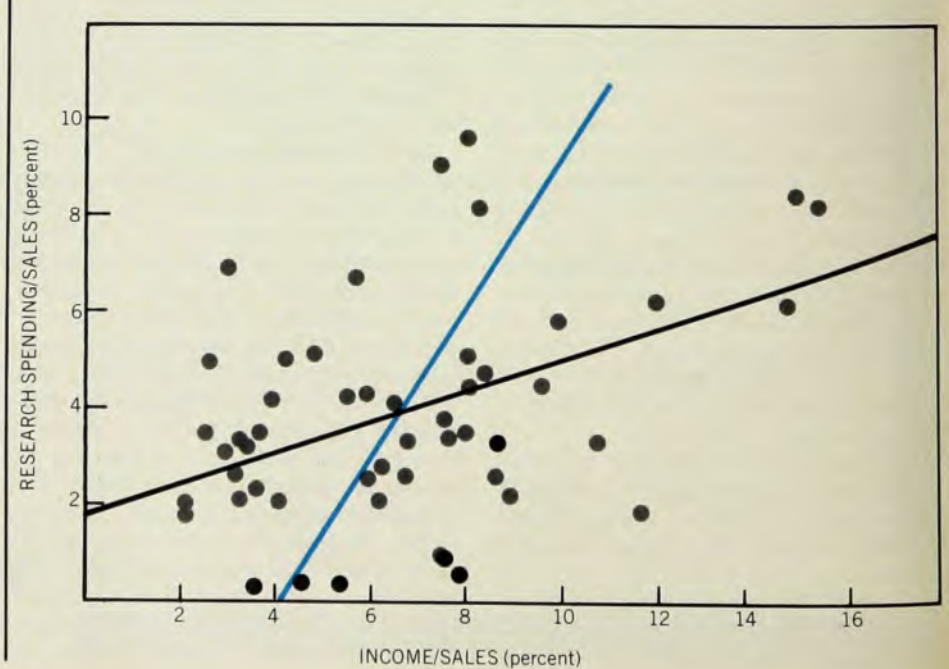
Unfortunately, the management of KGO and I learned something else from this experiment: My original plan was for a three-hour show that would cover modern physical science more generally by, for example, demonstrating how our everyday experience produces intuitions that are not valid in the microcosm. I had hoped for some discussion of Schrödinger's cat paradox, and the various ideas advanced to resolve that problem. Analogies for the wave function had been worked out involving an electron that goes to lunch and is subsequently sought by its secretary who, not looking too hard at first, finds the electron dining all over town, until she opens the door of a particular restaurant. However, this more ambitious plan had to be abandoned. There were just too many physicist colleagues who were unwilling to participate in the program because of petty rivalries, ego problems, fear of peer reaction to what they might say, arrogance, and just plain disinterest. This attitude did a lot to offset the demonstration that the public is indeed interested in pure science. The networks want to broadcast interesting programs. But they're not about to come begging to us when the ESP and flying-saucer advocates are lined up at their door, and there is equal public interest in the latter subjects.

To put it bluntly, those members of Congress who believe pure science is largely irrelevant for the general public have numerous allies in the physics community. That's something to consider the next time the NSF turns down your proposal.

ALLEN D. ALLEN
Algorithms, Inc.
3/17/78 *Northridge, Calif.*

Research profits

Shaky statistical inference should not go unchallenged, especially when an alternative inference is equally or more likely to be true. I refer to the guest comment by J. J. Gilman and R. H. Miller in March (page 9). Their figures 1 and 2 appear to support the popular belief among scientists that corporate support of research increases profits. I do not quarrel with this belief—only with their application of statistics and their unconvincing inference.

Many scientists and engineers working with linear regression do not seem to be aware that one can always construct two regression lines for any set of data and that the quotient of their slopes gives $b_1/b_2 = r^2$. Thus in figure 1 of Gilman and Miller the second regression line has a slope of 3.07, intercepts the abscissa at $x = 1.71$ and passes through the centroid of the data at $\bar{x} = 3.87$ and $\bar{y} = 6.63$.

To emphasize the alternative inference that I wish to explore, however, I have replotted their data in my figure with I/S as the abscissa and R/S as the ordinate, and have plotted both regression lines. What I referred to as the second regression line now has the slope 0.33 (the black line). An interpretation of this line might well be that major corporations with large profits support research rather than research supports profits. Surely this is a more appropriate interpretation of the data, especially in view of the simultaneity of the profits and the research support.