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COVER: The use of hypnosis in pain control is not new, but it is now being used as a major part of the treatment at several pain control facilities throughout the country and is gaining an increasing degree of acceptance by the medical profession. See p. 283.

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LETTERS

Evolution vs. teleology

The recent letters on use of teleological language in science (SN: 9/18, 10/9) brings to mind an experiment I made ten years ago with a group of zoology grad students. I asked them to consider seriously the question of *why* Darwin's finches had evolved in the particular pattern he found on Galapagos Island. Though I spent nearly an hour trying, in various ways, to get them to consider the content of the question, they refused unanimously to answer it, saying that the word *why* brought in teleology.

Then I pointed out that much more was known objectively about *why* the finches had evolved as they did (since each species had developed some anatomical specialization that enabled it to get food available in some particular ecological niche) than was known about *how* the evolution occurred (we still don't know enough concretely about how genetic processes produce such marvelously adaptive evolutionary changes in organisms). I explained further that a retrospective examination in such terms had nothing in common with the prior element of purposiveness implied by teleology. Then, of course, the students asked why I had not explained before what I was talking about.

I had failed utterly in my plan to stimulate their thinking on basic questions of evolutionary theory. Instead of stimulation, the word *why* had simply evoked the concept of teleology in a manner which prevented further thinking about the matter. I question the value of scientific schooling that produces such rigid associations between terms and concepts. Is it really necessary? May it not do more harm than good by curbing creative thought on scientific problems?

Lester Talkington
Tappan, N.Y.

The mammography debate

Dr. Bross and others of his calibre are performing a severe injustice to the women of America (Letters, SN: 9/11/76, p. 163). The statistics for morbidity from breast cancer have remained unchanged for the past 30 years and this disease continues to be one of the leading killers of women in the world. The *only* light on the horizon that has recently been shown to affect survival statistics is *early detection* of the disease and *appropriate therapy*. The early signatures of this disease detected via the X-ray examination of the breast (mammography) have only

recently been established and disseminated but, unfortunately, may be lost if individuals such as Dr. Bross continue to apply unscientifically produced, *generalized* statistics to the *individual* woman concerned for her health.

This is not to say that I reject the risk associated with mammography, or for any other radiologic examination. The risk exists and steps should be and *are* taken to reduce radiation exposure consistent with obtaining necessary diagnostic information. However, the data upon which much of the furor over mammography is based is extrapolated from studies that utilized much higher radiation doses at radically different X-ray photon energies than that sustained in mammography. Study results are presented, however, as if they were directly applicable to present low dose mammographic methods. If there is anyone doing the ramming, it is the evangelists who are ramming this gospel down the throats of the American women who look to these individuals for rational interpretation of academic investigation. The NCI-ACS mass screening program from the outset was designed as a voluntary participation program (and remains so to my knowledge). Unfortunately, the full benefit of the program cannot be assessed for some time but initial results point in the direction of lowering the morbidity from this disease for the first time in history.

However, the damage to the program has been done and whether Dr. Bross and his colleagues appreciate the impact of their actions fully or not, they have embarked on a tacit experiment of their own on American women which asks the question: What happens when we do nothing?

James M. Hevezi, Ph.D.
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School at Houston

A quick recovery

The week of Oct. 9 in SCIENCE NEWS the editors must have felt very bad, sending us a whole issue of negative news. We read about *absent* molecules, *delay* to evolution, element 107: U.S. *skeptical*, air bill *dies*, literacy *gap*, Foxbat *no* superplane, earthquakes and so on.

Was the weather bad in D.C. that week? Or did most of the staff have headaches? My wife and I will take an aspirin and wait for next week.

Francis and Eleanor Mulford
Kenmore, N.Y.

(Notice how we bounced back last week with the three Nobel Prizes, action to protect porpoises, and progress against Huntington's disease.—Ed.)

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