

# to the editor

## Photon rest mass

Noting your recent article (SN: 1/30/71, p. 83) concerning our experimental upper limit on the photon rest mass, we were pleased with your interest.

The idea of a photon rest mass is not a new one but nonetheless is still very interesting and nontrivial. Since the time of Cavendish, certain physicists have not been satisfied with speculative assertions on this subject, and have periodically reexamined the question, in one form or another, to determine what valid experimental limit could be placed on the photon mass.

The question of the photon mass is both theoretical and experimental. If the photon mass were not zero however, no harm would come to the special theory of relativity; since the velocity that enters in the Lorentz transformation would simply be not the velocity of light, but a limiting velocity  $c$  to which velocities of all bodies tend when their energy becomes much larger than their mass. Theoretically, the question is intriguing since all of our classical equations of electricity and magnetism are modified to incorporate this finite mass term. A concise study of "massive" electrodynamics will lead us to a deeper understanding of classical theory. Experimentally, there is no guarantee that attempts to increase this upper limit will not lead to unexpected results.

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## Radiation hazards

I think you have done an excellent job of reporting in the article "Another round on radiation" (SN: 1/30/71, p. 78), and I certainly have nothing critical to say about the article.

I have several points to make in severe criticism both of Dr. Lauriston S. Taylor and the National Council on Radiation Protection and Measurements.

Dr. Taylor claims that the membership of NCRP has "49 out of 65 who are presumably not heavily invested in the future of the nuclear industry." That statement of his will not stand up under close scrutiny. I urge SCIENCE NEWS to list the membership of the NCRP, and with such listing to provide the affiliation and/or research grants of the individuals concerned. The conflict of interest will be apparent even to the most starry-eyed hopefuls.

Second, Dr. Taylor and the NCRP have declined to accept a debate with

Dr. Arthur R. Tamplin and me before an impartial jury of scientific peers. I urge you to let the readership of SCIENCE NEWS know that this debate was requested over a year ago. I believe the reasons for NCRP's dodging such a debate require no elaboration.

Matters such as radiation hazard are of extreme moment. It is urgent that open-forum debate on disputed points be held so that the nature of the controversy becomes apparent to all. We are fully confident about presenting our evidence, arguments and conclusions before such an impartial jury. We believe the reason NCRP shies away from such a debate is that NCRP cannot tolerate public realization of the unsound public health principles which underlie their recommendations.

Lastly, one would certainly hope that the new Environmental Protection Agency will not use NCRP guidance on any matters of radiation safety. EPA has an opportunity to introduce the first constructive approach to radiation hazard evaluation that has characterized atomic energy development. EPA could make a signal contribution by insisting upon an open forum debate before a jury of peers, so they (EPA) can have a reasonable basis for setting future radiation standards. Otherwise public confidence in EPA will be seriously undermined at the outset of EPA's history.

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(One clarification: The phrase "presumably not heavily invested in the nuclear industry" is not a direct quote from Dr. Taylor but our expression of the meaning of his remarks about the 49 members. Ed.)

## A doctor's reply

As one of the doctors who needs to be taught more about nutrition, I would appreciate receiving a list of even some of the literature to which W. J. Hitchcock and Mrs. Julio P. Gasteiro refer in their letters (SN: 1/30/71, p. 76).

If Mrs. Gasteiro had investigated the American Medical Association with even a little of the unprejudiced vigor she must have spent on the subject of ascorbic acid, she would have found that it publishes a significant number of books and pamphlets, for the specific purpose of helping people to help themselves. She can obtain a list of these by writing to AMA Headquarters, 535 N. Dearborn, Chicago, Ill. 60610.

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# films OF THE WEEK

**DEEP-SEA DRILLING PROJECT.** 16mm, color, sound, 27 min. Documents the voyage of the Glomar Challenger, the first ship designed for drilling in the deep oceans. On board, satellite navigation equipment is used to pinpoint the location of each drilling site, and then when the ship is "on station," a computer-controlled positioning system takes over to hold it over the spot without anchoring or mooring. From the bottom, where they have remained untouched for more than 140 million years, long cores of sediment are raised up through nearly four miles of pipe. A study of these cores has given scientists their first direct measurements of how fast the sea floor spreads out from its center, pushing the continents apart in the process. By-products of the research have been the discovery of oil in the Gulf of Mexico, and the location of other sea-bed resources of great future value. Audience: general. Free loan from Association-Sterling Films, Dept. SN, 866 3rd Avenue, New York, N.Y. 10022.

**THE HEARTMAKERS.** 16mm, color, sound, 59 min. The development of an artificial heart suitable for human use is inevitable, but a debate rages as to the right time for human experimentation. This report includes interviews with Dr. Denton Cooley, who made the first artificial heart insertion, and Dr. Michael DeBakey, who opposes using the heart at the present time. The main problems to overcome in using artificial hearts are the power source and the internal lining of cells. Research funding, which comes almost entirely from the Federal Government, has been drastically cut, and some programs have had to disband. Part of the exclusive medical record showing Dr. Cooley inserting the first artificial heart in the famous Karp operation is seen. Audience: secondary, college, adult. Purchase \$550 or rental \$20.50 from Audio-Visual Center, Dept. SN, Indiana University, Bloomington, Ind. 47401.

**ENDLESS CHAIN.** 16mm, color, sound, 28 min. Tells the story of an important ecological study on the isolated desert steppe of southeastern Washington State, aimed at helping man live in harmony with his delicate complex environment. The film begins with a look at the "endless chain of life" in the desert: the ceaseless transfer of the sun's energy to plants, to insects, to animals. The cycle is completed as bird droppings are washed down by rain to become nutrients for plants. Scientists from Battelle-Northwest investigate the plants, animals and interacting food chains of the desert with the ultimate objective of achieving guidelines so man can learn to protect the delicate web of life around him and his environment. Audience: general. Free loan information from Audio-Visual Branch, Department of Public Information, U. S. Atomic Energy Commission, Washington, D.C. 20545.

**JUNIOR ENGINEERING AND INDUSTRIAL ARTS.** 16mm, b&w, sound, 14½ min. Develops the underlying concept of "junior engineering" and how it might be developed within the framework of existing industrial arts laboratories. The film carries the viewer along the detailed methodology and ways to introduce this new and interesting approach to secondary students. It concludes by reflecting actual laboratory activities of high motivating interest and the resulting technical hardware developed by the students. Audience: junior and senior high, college. Purchase \$25 from Acme Film and Videotape Laboratories, 1161 Highland Ave., Hollywood, Calif. 90038 or rental \$2.50 from Director, Educational Media Center, Florida State University, Tallahassee, Fla. 32306.

Listing is for readers' information of new 16mm and 8mm films on science, engineering, medicine and agriculture for professional, student and general audiences. For further information on purchase, rental or free loan, write to distributor.