Letters

Lasers and Eye Protection

The Food and Drug Administration's Bureau of Radiological Health has been conducting preliminary tests of equipment to protect eyes against laser radiation. The test findings and actions being taken as a result may interest those who buy or use such equipment.

Protective goggles are used in certain laser applications to protect operators or bystanders from direct exposure to high radiation levels which could cause serious eye damage. Without protective eyewear and either fixed or portable shields of the same material, many injuries from laser exposure possibly would have occurred.

The exposure of laser goggle materials to sufficiently high power or energy will cause damage in the form of melting, bleaching, bubbling, or shattering. However, some eye-safety products will fail after several seconds of exposure to laser beams of about 1 watt, or a power density of about 6 to 12 watts per square centimeter. The Bureau of Radiological Health is concerned that not all users or buyers of eye-protection equipment are aware of this fact.

Manufacturers have been notified that some types of protective eyewear have failed during preliminary nonhuman testing in bureau laboratories. The bureau, however, has received no reports to date of human injury that might have occurred as a direct result of eye-protection equipment failures.

Representatives of manufacturers and of professional groups met on 5 October at bureau headquarters in Rockville, Maryland, to discuss methods by which all products providing eye protection from lasers could be uniformly evaluated and appropriately labeled, and the essential information disseminated to users and purchasers.

The bureau is working with manufacturers and other affected groups to develop criteria for the selection and use of protective eyewear in order to provide guidance for laser users and purchasers at the earliest possible date.

Laboratory personnel at the bureau noted that protective goggles intended for use with helium-neon gas lasers, which normally have an output of a few milliwatts, have not shown signs of failure in the limited tests conducted thus far. Those who use these goggles when operating such low-power, helium-neon lasers should continue to do so.

Individuals using protective goggles around high-power lasers—for example, a multiwatt argon-ion laser—are advised to determine the failure points of their eyewear by contacting the manufacturer. In the event that the necessary information is unavailable, the eyewear should be tested by exposure to the most intense radiation against which it is expected to provide protection. Such a test should represent the worst case condition of exposure to the eyewear. The eyewear tested should be carefully inspected before it is returned to service. If the eyewear fails, operation of the system should be suspended until alternate means of personnel protection are provided. Eye-protection equipment should always be inspected before each use for signs of melting, bleaching, bubbling, or cracking. If any one of these signs is noted, the eyewear should be removed from service.

Multiwatt lasers may commonly be found in universities, industry, research laboratories, and in medical facilities. In some instances, servicing and alignment procedures for these lasers may result in possible direct exposure to a high-power laser beam over a period of seconds or possibly minutes. Under these circumstances, the worker may risk serious eye injury if he is unaware of the failure point of the protective eyewear.

The chance of eyewear failure increases as laser power and energy rise. Therefore, persons buying a laser product are urged to make certain that the presently owned eye-protective equipment will accommodate the power of the new product.

It is the intention of the bureau to develop, both from laboratory experience and from suggestions submitted, a set of criteria for the selection and use of protective eyewear in laser applications. Suggestions, comments, or information that would assist the bureau in establishing criteria and collecting data on eyewear failure would be welcome. Communications should be directed to the Director, Bureau of Radiological Health, Food and Drug Administration, 5600 Fishers Lane, Rockville, Maryland 20852.

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Safety of Cosmetics

During the past 3 years, government officials and consumer activists have repeatedly charged that cosmetics cause serious injury to 60,000 people every year. That the acceptance of the charge as fact is a serious matter is indicated by the statement (*1*) made by Senator Thomas F. Eagleton (D–Mo.) in announcing the scheduling of hearings on his bill (*2*) to amend the Federal Food, Drug, and Cosmetic Act:

> The National Commission on Product Safety reported that 60,000 people, mostly women, are injured by cosmetics every year severely enough to restict activity for one day or require medical attention.

Investigation of this oft-repeated statement reveals that it is erroneous and misleading. Senator Eagleton was quoting the National Commission on Product Safety (NCPS) correctly (*3*), but NCPS misrepresented the report (*4*) by the Department of Health, Education, and Welfare (HEW) from which the 60,000 figure was taken. That report made it clear that the figures were only estimates, with an unknown error. According to the major author of the report, John H. Morrison, Jr. (*5*), because of the lack of information at that time on injuries from cosmetics, the figures cited in the report were derived almost exclusively from the reports (*6*) of accidental ingestions of products from the national network of poison control centers in the United States. By statistical extrapolation from these reports, the figure of 60,000 was arrived at. He agreed that the reported accidental ingestions were not necessarily serious injuries but explained that they met the definition of injury in the HEW study because medical attention was sought.

Since most cosmetic products are innocuous when ingested, the overwhelming bulk of the inquiries do not even result in treatment, much less injury. To illustrate, one finds that only 7 out of each 1000 instances of acci-

dental ingestion of cosmetics reported in 1968 (*6*) resulted in hospitalization.

More meaningful estimates should emerge from the National Electronic Injury Surveillance System (NEISS), which has recently published its first year's summary of injuries associated with selected consumer products (*7*). Although NEISS has not yet published any extrapolation of its data, the notes on the data state: "Statistically valid projections of all data may be made . . ." (*8*). My own review of their data suggests the following estimates of the number of injuries related to (but not necessarily caused by) cosmetics in fiscal year 1973:

Injuries related to accidental misuse	2100
Injuries related to container	2400
Injuries related to product	9700

This is a remarkable record of safety for an industry that distributes an estimated 6 billion units of thousands of different products each year. In addition, the NEISS figures on accidental ingestion suggest a national total of 15,700 injuries from cosmetics, rather than the estimate of 60,000 injuries from HEW.

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References and Notes

1. *Congr. Rec.*, 31 July 1973, p. S-15135.
2. *Cosmetic Safety Act of 1973* (U.S. Senate Bill S.863, 1973).
3. National Commission on Product Safety, *Final Report* (Government Printing Office, Washington, D.C., 1970).
4. National Commission on Product Safety, *Supplemental Studies*, Vol. 1, *Product and Injury Identification* (Government Printing Office, Washington, D.C., 1970).
5. J. H. Morrison, Jr., personal communication. Morrison was, at the time of the study, Chief of Descriptive Epidemiology, Injury Control Program, National Center for Urban and Industrial Health, Department of Health, Education, and Welfare, Washington, D.C.
6. *Bull. Natl. Clgh. Poison Control Cent.*, entire issue (Sept.–Oct. 1969).
7. *NEISS* (*Natl. Electron. Inj. Surveil. Syst.*) *News* **1**, No. 6 (Aug. 1973).
8. *Ibid.*, No. 5 (July 1973).

Exercise and Heart Disease

As a compulsive runner (averaging 5 or 6 miles a day, every day), I want very much to believe that "when the level of vigorous exercise is raised high enough, the [cardiovascular] protection appears to be absolute" (T. J. Bassler, Letters, 12 Oct., p. 113).

Unfortunately, in spite of "the American Medical Joggers Association [having] been unable to document a single death resulting from coronary heart disease among marathon finishers of any age," I can cite at least one. Paavo Nurmi, the "Flying Finn," who won the marathon in the 1928 Olympics and, in the process, set 28 world distance marks, died recently from heart disease (*1*).

Granted, such causality of death is *almost* unheard of. But almost nothing is so absolute as is being contended by Bassler.

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References

1. *Time* **102**, 110 (15 Oct. 1973).

I agree with T. J. Bassler that the key to prevention of coronary artery disease is exercise, not cessation of coffee drinking. However, Bassler's statement concerning the association between levels of vigorous exercise (marathon running) and apparent absolute protection against heart disease needs to be qualified on at least two points.

1) Marathon runners possess a tremendous aerobic and cardiovascular capacity, with large stroke volumes evident at rest and during exercise (*1*). This capacity is surely the result of vigorous exercise, but additional characteristics of a marathoner's life-style lack any correlation with factors considered to be etiologic in the development of coronary heart disease. In general, marathon runners are nonobese, with 9 percent less fat than normally active people of comparable age (*2*). They do not smoke, do not suffer from hypertension, and do not consume large quantities of alcohol, coffee, or cholesterol-rich foods.

2) The absoluteness of protection marathon running affords against coronary heart disease is related to an individual's ability to maintain some degree of physical activity during the years after finishing the marathon running. Physical fitness is analogous to a tire with a slow leak; as long as one continues to replace the air periodically, one can maintain a certain reserve capacity and avoid flatness (infarction). If done properly and with some degree of regularity, vigorous exercise can have the same high measure of prophylaxis for heart disease that the "pill" has for pregnancy.

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