

tions, other less predictable but equally important stimuli, such as pedestrians, cyclists, and disabled vehicles, are often only dimly illuminated, resulting in hazardous situations. Due to the blurring as a result of night myopia, the detection and recognition of such dimly lit obstacles may be delayed until the braking or evasive maneuvers necessary to avoid an accident are impossible.

Since the major tasks of driving are relatively unimpaired by reduced illumination, the driver does not anticipate and is not prepared to deal with stimuli for which the focal system suffers a selective deficit. In effect, the driver is unjustifiably reassured by the high performance level of the dynamic spatial orientation system and is unaware of a loss in focal visual abilities. Since the visual deficit is only partial and of consequence only for low-probability stimuli, the driver is unaware of the loss of function and does not take the necessary precautions. In contrast to such naive overconfidence, drivers who are aware of their visual loss, such as those with incipient cataracts (13) or with small pupils associated with glaucoma therapy, are reluctant to drive at night.

Several precautions can be taken to improve this situation. An obvious one would be to increase the visibility of unexpected obstacles by continued efforts to improve roadway illumination and by increased usage of highly reflective markings. A more general and presently unused measure would be to screen drivers for night-time as well as daytime visual performance and to optimize their abilities by providing optical corrections at night when necessary. In the past, the cause and correction of night myopia have been topics of some controversy. However, recent studies from this laboratory, which attribute night myopia to a shift in ocular accommodation toward the individual's resting or dark-focus (*Akkommodationsruhelage*), suggest a simple method for counteracting the loss of image clarity at night. An evaluation of the dark-focus with a laser optometer has permitted us to recommend an individually determined optical correction specifically for night myopia which substantially improves form perception under both laboratory and field conditions (14). In a small sample of college students, this correction was found to improve visual acuity by as much as 25 percent under simulated night-time driving conditions; similar improvements for the detection of weak stimuli would be expected. At highway speeds this added margin of visibility could weigh heavily in the interest of accident prevention. It is hoped that awareness by drivers and

traffic safety authorities of the selective nature of the visual losses at night will provide the basis for measures to reduce the appalling frequency of accidents at night.

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#### Is Small Always Beautiful?

I would like to add one more note to the many that have undoubtedly been received concerning the use of natural gas, uncoated, nonglossy paper, or coated paper in the production of *Science*. In the 1 April issue the increased costs related to using the uncoated paper were provided, not the least of which is the environmental impact of producing the extra 16 tons of paper required for the 11 February issue. By imposing the single criterion of "low cost," it has been determined that a coated, glossy paper should be used. The significant point is that these coated papers are the result of "high technology."

Thus we have a dramatic example that the "small is beautiful" philosophy and its "intermediate technology" do not always provide the best solution; nor do they implicitly improve the quality of life, save natural resources, or protect the environment.

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