Letters

Auto-Safety Research

If the credibility of Ralph Nader's book *Unsafe at Any Speed* may be judged from his recent statements concerning the Franklin Institute (as reported in News and Comment, 26 Nov., p. 1136), the book qualifies as a work of fiction. Compare his remarks with the respective true statements in brackets:

"The Bureau of Public Roads recently gave a large grant to the Franklin Institute" [after competitive bidding the Franklin Institute Research Laboratories won a research contract] "for research on how force is transferred through metal" [the contract deals with developing a dynamic model of overtaking and passing on two-lane rural highways and, subsequently, the identification of methods for increasing the safety and efficiency of such overtaking and passing]. "Right away American Motors offered to supply the cars." [The institute solicited Ford, General Motors, Chrysler, and American. Only American agreed to help in this way. The cars, by the way, are only on loan, not a gift.]

One could, perhaps, go on in this vein, but there are more basic objections to the book (assuming that the review in *Science* presents Nader's views fairly). One is the impression it gives that the automobile industry is somehow against, or at least not interested in, safety. Nothing could be further from the truth. The industry is interested in selling cars, and killing customers is bad for business. While it is undoubtedly true that irrelevancies of the stylists interfere with the safety, convenience, and efficiency of cars, it is equally true that the industry spends a great deal of time and money in safety research. No one who has seen the safety-research facilities at, for example, American Motors or the General Motors Technical Center could agree with Nader's reported view that "the industry does not have a well-developed in-house capacity for safety research." Of course, whether full use can be made immediately of the knowledge obtained is another matter.

There is no question that the field of traffic safety needs careful, unbiased examination. The field is surely full of sacred cows which consume much of the available grazing. For example, in spite of much publicity, it is doubtful whether current driver-training programs really do anything to reduce accidents. The utility of safe-driving slogans and of publishing accident statistics at holiday time has not been demonstrated. But exposé will not substitute for sober thought, and the harm done through misleading statements may seriously impede progress in safety.

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The description of the Franklin Institute's research project did not appear in my book but was the unfortunate result of an oral communication. I am grateful to Krendel and Silver for making the technical corrections. By extending their remarks, however, they proceeded to illustrate my point—namely, the diminution or loss of critical capacity vis-à-vis the auto industry whenever university researchers solicit or receive (the difference is usually a formal maneuver) funds or equipment from the companies for undertakings launched and financed through federal contracts or grants.

Krendel and Silver might have paused to scan the evidence contained in the book before lunging into their general condemnation. As scientists, they should be the first to notice how contemporary automobiles violate the most elemental requisites of safe man-machine interaction, while the manufacturers refuse to apply or develop improved designs. As detailed in my book, the parsimony of the industry's investment in human engineering and crash-injury research, its long and intensifying record of opposition to forces for safer automobiles, its repeated refusal to eliminate lethal structures from one model year to another, and its secrecy and misrepresentation in defiance of the canons of scientific communication have produced a massive betrayal of the public trust.

The motives for the industry's behaving in these ways are far more intricate than the writers' observation that "killing customers is bad for business." This reason is as superficial as its truer rejoinder that wrecked cars generate far more sales than dead humans subtract. The tragic situation is that the auto industry has been producing obsolescent automobiles year after year because of a combination of legal immunities, the absence of independent centers for research and testing, and the numerous consequences of an oligopoly, dominated by General Motors, that has made a mockery of consumer choice, the free market, and competitive initiatives. In the absence of these stimuli, it is not surprising that the bureaucratic rigidities and the resistance to innovation on the vehicle are in sharp contrast to the technological progress on the production line.

I have seen the safety-research facilities of the automobile companies and have listened to complaints of their inadequacy by company employees. In terms of men, funds, and equipment, their "in-house capacity" (as distinguished from potential) is decidedly underdeveloped.

The final test of an auto maker's sincerity in safety is what he puts into his automobile. Here Krendel and Silver tread lightly, as indeed they should. With windshields that can be penetrated at 12-mile-per-hour impacts, seats that uproot at less than 9*g*, bumpers that are entirely cosmetic in purpose, passenger compartments that crumple like Japanese lanterns, and brakes, tires, vehicle-induced glare, carbon monoxide, and handling characteristics that increase the number of accidents, the proof of manufacturers' irresponsibility is in their product.

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. . . I have recently carried out a preliminary analysis, to be published by the University of Minnesota as part of the proceedings of the 1965 Stapp Auto Crash Conference, of the acceleration patterns accompanying auto accidents. This indicates that in half the cases of car riders killed on our highways, decelerations of less than 20*g* in the passenger compartment are involved. My impression is that, if proper restraining devices were employed, most people would be uninjured or only slightly injured in decelerating from legal speeds, with no part of the body experiencing more than 45*g*. . . . The death toll could be cut at least in half by improve-

ments in the vehicle. Driving and roads must also be improved, but vehicle improvements are long overdue.

Seats that do not break, and shoulder straps as well as the lap belt (provided riders use them) are one answer. We are exploring an alternative possibility—airbags about the passengers (but not the driver) that would inflate automatically if sensors detect a potential accident situation, or ultimately and at a faster rate if impact actually occurs. The passengers would be protected even though they had not "strapped in." Work on such a device for astronauts and aircraft passengers, done with NASA support, has had promising results.

We should insure that the study of the problems and the development of solutions bear a growing relation to the magnitude of our losses, which—roughly measured by the cost of car accidents, injuries, and deaths (including insurance settlements and wages lost)—are about $9 billion this year. The approximately 25 cents per car which Nader indicates manufacturers spend for safety research, and the 4 or 5 cents per car passenger which the federal government spends each year for highway safety research, should be increased until the number of deaths and injuries each year no longer climbs and indeed is significantly reduced. . . . Apparently legislators must take the next steps, for the informed consumer cannot obtain or afford to buy the safety features which he should have, while manufacturers sell us "tuned" and "styled" tigers.

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. . . The evidence of great resistance within the automotive industry to changes that would reduce deaths and injuries in highway accidents is seen as well in changes that would reduce the likelihood of an accident. Major features of cars that have been shown to be hazardous because they interfere with vision are tinted windshields, distorted windshields, large windshield corner posts, view-obstructing inside rear-view mirrors, chromium windshield trim, chromium covers on the inside of the corner posts, and chromium on the steering wheel. Recently Chrysler and General Motors began using, in most of their models, a dull, relatively dark paint or padding on their dash panels. The Ford Motor Company is still selling cars with glossy painted dash panels, which reflect into the windshields with devastating effect on vision under certain circumstances. Chromium anywhere within the field of view that can reflect the sky or headlights into the driver's eyes is known to be harmful. Apparently manufacturers believe the natives want to buy shiny trinkets, and if they complain of glare they can then be sold tinted windshields.

Manufacturers's indifference to safety problems is well illustrated by their failure to adopt periscopic, panoramic rear-view mirrors that were publicly demonstrated over 10 years ago, and by failure to use a method of windshield wiping by a flow of air that prevents water, dirt, and bugs from getting on the windshield at all. The currently standard shield placed above the filament in headlights was not adopted for over 17 years after its invention, although the inventor tried to sell it to the automobile and lightbulb manufacturers before his patent expired.

A very serious omission can be seen in the continued absence of standards for signals. Turn signals can be buried in bumpers, hidden by fenders, and covered by chromium. They can be small or huge, feeble or bright, and close to headlights or far removed. Tail lights may be combined with brake, turn, and backup lights in all possible combinations, or they may exist alone. They may be high, low, widely separated, close together, large, small, bright or dim, single or double, shielded by fenders, covered by chromium, and colored deep red, orange red, or amber. That this most important safety feature has not been removed from the stylists' manipulations is indeed remarkable.

That manufacturers apparently have little interest in drivers' safety is seen in the so-called after-market. Millions of dollars' worth of useless automotive accessories, some hazardous, are widely promoted and sold each year with never any word of caution from the automobile manufacturers. An example is the chromium "sleepy eye" headlight covers that lie flat against the upper half of the bulb. (Some new car advertisements in magazines and on billboards have implied the presence of these covers by a line drawn across the head lamp.) Our studies have shown that the claims made for these covers are fraudulent. They do not reduce glare as claimed, but rather increase it from two to ten times, and they do not increase useful light on the road

as claimed, but reduce it, sometimes to less than 50 percent. Any automotive lighting engineer worth his salt knows these facts. . . .

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It is astounding to me and should be humiliating to the scientific community that *Science* would permit the printing of such an unscientific book review as that given to Ralph Nader's *Unsafe at Any Speed*. The reviewer says that the book "is likely to be the *Silent Spring* of traffic safety." To me this only means that it will be as packed full of errors and leftist propaganda as was *Silent Spring*.

The controversy over automobile safety sorely needs the application of more true science. An approach to this was made some 15 years ago in a joint study by the Pennsylvania State Police and the Union Switch and Signal Company on the cause of crashes (I refuse to call them "accidents") on the Pennsylvania Turnpike. This study, which certainly approached scientific status, showed that the major cause of all crashes on the turnpike was not speed, or poor car design, or poor car maintenance, but *driver ineptitude*. I hold that more, many more, studies of this type are needed.

I disagree wholeheartedly with the reviewer's comments on Nader's references to the Corvair. I drove a 1961 Corvair for 4 years and have driven a 1965 for almost a year without the slightest difficulty, and I have some scientist friends who have done similarly. I'll admit that I do not try to make 90-degree turns at 75 miles per hour, nor do I try to stop on a dime on an icy road. I believe that, if the cause of the alleged difficulties with the Corvair were truly known, they would be no different from similar difficulties with other cars when ordinary drivers in thick traffic start imagining they are driving the "500" at Indianapolis.

Close observation on a short drive in almost any large U.S. city will readily demonstrate that an appreciable element in the causes of crashes is the disregard of very ordinary safety practices by one or more of the drivers involved. This in turn is caused by such driver characteristics as (i) ignorance of safe practice, (ii) simple ineptitude, (iii) lack of coordinating ability, (iv) disregard of the welfare of

others and themselves, (v) aggressiveness, determination to get ahead no matter what happens, (vi) driving too fast for traffic conditions. The tendency to blame the manufacturers, aside from the socialistic implications of the federal government, represents a tendency in nearly all walks of life for people to blame external things for their own shortcomings. There is a greatly increasing tendency to abhor the acceptance of personal responsibility.

If the manufacturers ever contrived to build a car safe enough for all of the nuts on the road, it would look like a tank and cost like one. It is almost as though the flying public were to demand that passenger-carrying aircraft be designed and built to withstand any kind of crash from any altitude. Anyone who has driven cars for the past 45 years, as I have, will, I think, agree that through the years cars have become progressively safer. Anyone who has seen the wooden wheels of a Model T catch fire coming down Laurel Mountain will agree to this. In fact, it is to be wondered how enough people survived the earlier cars to nurture the automotive industry to its present state.

So please! Let's have more science in *Science* and less politics.

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Grants and Copyrights

The U.S. Office of Education has recently ruled that materials produced by its grantees are not to be copyrighted but are to be placed in the public domain. Although the clear intent of the regulation is to serve the public interest, it appears likely that, in practice, it will have the opposite effect.

What are the probable effects of this new regulation on the future production and dissemination of curriculum materials similar to those, for example, prepared recently by the secondary school science projects in biology, chemistry, geology, and physics, which have been quite widely regarded as of great public value? (I am not concerned here with the effect of the regulation on studies of primarily technical or academic interest.) If a USOE grantee were to produce a manuscript for a good chemistry textbook that could not be copyrighted, the reaction of the major textbook publishers would be, I believe, generally negative. An ethical publisher might acknowledge the excellence of the new text and might recognize how satisfactorily it could supplement his line of textbooks. But he would realize that the same materials could also be published by any other publisher, with or without change, and perhaps more rapidly and cheaply. Thus, he might well decide that his necessarily extensive investment in such a book, for careful editing, preparation of illustrations, training of salesmen, national advertising, and printing and distribution, would place him at a competitive disadvantage with respect to other publishers who might use the same materials with a minimum investment. It appears probable that contemporary public-domain materials would be ignored by the more substantial publishers who have full facilities for national distribution, and might even be considered too risky by virtually all publishers.

But there is a more fundamental consideration. Such materials as these do not emerge simply as the result of a grant; they depend also on the creative efforts of scholars and writers. They have an intellectual as well as a fiscal component. Surely the traditional rights of an author should not be summarily discarded simply because his work promises to be of public benefit and has therefore been judged worthy of support from public funds.

The director of a curriculum project supported by the Office of Education may find it difficult to recruit writers who are seriously interested in producing new curriculum materials for our schools, if they are aware of the possible effects of the public domain policy on their efforts. They would realize that their materials might never be published and made available for use in the schools; that their carefully devised themes and logical presentations could be altered at will by editors and publishers; that they might be completely excluded from the opportunity to revise their original ideas on the basis of actual use in the schools. . . .

It seems clear to me that the public domain policy of the Office of Education requires further study. Execution of the policy should be postponed until it is abundantly clear that it is not contrary to the public interest.

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