although the only questions that have been raised about it are still the subject of sharp dispute.

McCone's attitude toward AEC information policy made its first appearance when Los Angeles was visited, last fall, with an unusually high radiation level after a Nevada test. "No harm was done, none whatsoever," said McCone — who was in Geneva at the time. Authorities agree that his statement was almost certainly inaccurate; there may not have been *much harm*, but scientists agree that there was some, particularly genetic, damage.

Another reminder that McCone is the hand-picked successor of Lewis Strauss came at his January press conference, which took place shortly after the AEC had placed on the President's desk — and made public — a nuclear-power device for satellites and missiles. Washington physicist Ralph Lapp wrote an alarming letter to a newspaper, pointing out that the device was powered by radioactive polonium, and that should it be installed in a missile and should that missile blow up near the ground (as an Atlas did a few weeks later), many square miles around the test site could be contaminated for years. Asked about it at the press conference, McCone shrugged it off with the observation that operational models wouldn't use polonium — without noting that any possible substitute would be very nearly as bad (the probable fuel will be cerium-144, which is even worse).

IN THE field of power development, Strauss's policy was to keep the AEC well out of it, to pay research and development costs and to give "fuel subsidies" for reactors, but no more. Last October, McCone appointed a group to study the situation — a group which included former AEC member Henry Smyth and Eugene Starr of the Bonneville Dam Power Administration, but which also included three Standard Oil men and the president of the Pacific Gas & Electric Co., California's private-power colossus. When their report came in in January, it called for "a vigorous development program" to be led by the AEC, since nuclear power "still has a long way to go before it can be turned over entirely to private industry." In other words, the government should spend more money on developing atomic power, and shouldn't try to turn it over to private enterprise until development costs are out of the way and private enterprise can get down to making a profit with it.

McCone will probably plump for bigger subsidies to private-reactor builders, perhaps making up for all or most of the difference between the cost of the nuclear plant and the cost of a comparably-sized conventional plant. But Representative Chet Holifield of California has already blasted the AEC's fiscal-1960 reactor-building program as "pitifully small" and "inadequate," and some members of Congress — notably including Senator Anderson — have insisted that the government should build the reactors itself [see "Atomic Energy: Seven Key Issues," by Senator Anderson, *The Nation*, April 4]. McCone, like Strauss, is likely to regard any such suggestion with virtuous horror.

A safe bet on McCone's future can be made to cover all three fields. By pushing for bigger subsidies for private-reactor builders, he'll be hailed by most of the press for his vigorous leadership; by stubborn insistence on the "clean-bomb" program and with darkly ominous hints about Soviet perfidy, he'll be an obstacle to test-ban and disarmament proceedings; and by issuing insouciant statements whenever scientists become alarmed, he'll keep most Americans in their present state of nuclear confusion.

THE SAFE CAR YOU CAN'T BUY . . *by Ralph Nader*

THE CORNELL Aeronautical Laboratory has developed an exhibition automobile embodying over sixty new safety concepts which would enable an occupant to withstand a head-on collision at 50 mph with at most only minor scratches. In its design, six basic principles of crash protection were followed:

1. The car body was strengthened to prevent most external blows from distorting it against the passengers.

2. Doors were secured so that crash impacts could not open them, thereby saving passengers from ejection and maintaining the structural strength of the side of the car body.

3. Occupants were secured to prevent them from striking objects inside the car.

4. Interior knobs, projections, sharp edges and hard surfaces have been removed and the ceiling shaped to produce only glancing blows to the head (the most vulnerable part of the body during a crash).

5. The driver's environment was improved to reduce accident risk by increasing visibility, simplifying controls and instruments, and lowering the carbon monoxide of his breathing atmosphere.

6. For pedestrian safety, dangerous objects like hood ornaments were removed from the exterior.

This experimental car, developed with funds representing only a tiny fraction of the annual advertising budget of, say, Buick, is packed with applications of simple yet effective safety factors. In the wrap-around bumper system, for instance, plastic foam material between the front and rear bumpers and the back-up plates absorbs some of the shock energy; the bumpers are smoothly shaped to convert an increased proportion of blows from direct to glancing ones; the side bumpers are firmly attached to the frame, which has been extended and

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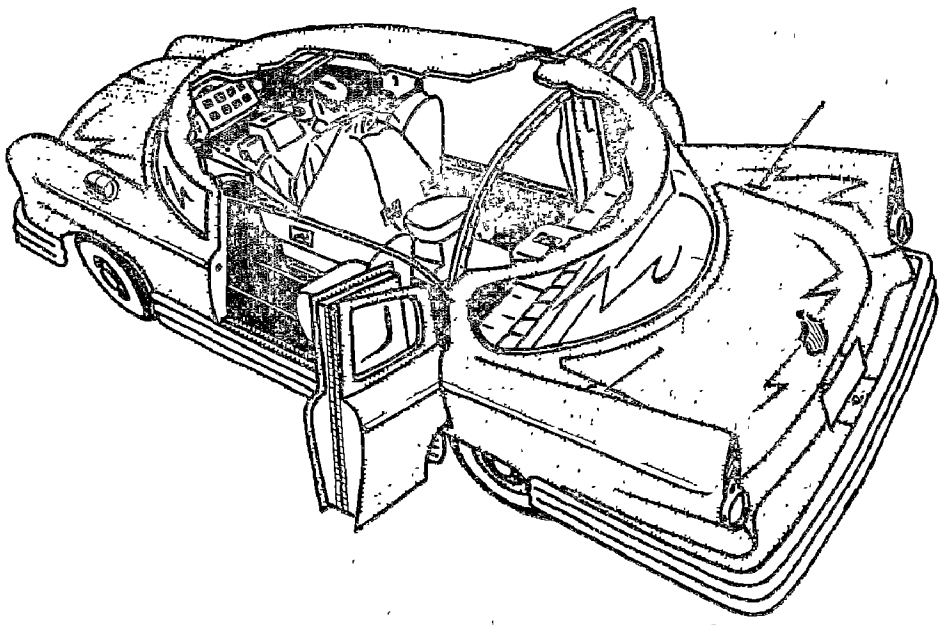
RALPH NADER began his studies of the relation between automotive design and highway casualties at Harvard Law School in 1957, and has continued them since.

reinforced to provide support. Another feature is the installment of two roll-over bars into the top of the car body as added support.

IT IS CLEAR that Detroit today is designing automobiles for style, cost, performance and calculated obsolescence, but not — despite the 5,000,000 reported accidents, nearly 40,000 fatalities, 110,000 permanent disabilities and 1,500,000 injuries yearly—for safety.

Almost no feature of the interior design of our current cars provides safeguards against injury in the event of collision. Doors that fly open on impact, inadequately secured seats, the sharp-edged rear-view mirror, pointed knobs on instrument panel and doors, flying glass, the overhead structure—all illustrate the lethal potential of poor design. A sudden deceleration turns a collapsed steering wheel or a sharp-edged dashboard into a bone- and chest-crushing agent. Penetration of the shatterproof windshield can chisel one's head into fractions. A flying seat cushion can cause a fatal injury. The apparently harmless glove-compartment door has been known to unlatch under impact and guillotine a child. Roof-supporting structure has deteriorated to a point where it provides scarcely more protection to the occupants, in common roll-over accidents, than an open convertible. This is especially true of the so-called "hardtops." Nor is the automobile designed as an efficient force moderator. For example, the bumper does not contribute significantly to reduction of the crash deceleration forces that are transmitted to the motorist; its function has been more to reflect style than absorb shock.

These weaknesses of modern automobile construction have been established by the investigation of several groups, including the Automotive Crash Injury Research of the Cornell University Medical College, the Institute of Transportation and Traffic Engineering of the University of California and the Motor Vehicle Research of Lee, New Hampshire. Careful coverage of all available reports do not reveal a single dissent from these findings:



Sketch of the Cornell-Liberty Safety Car

1. There are direct causal relationships between automotive design and the frequency, type and severity of injuries.

2. Studies of body tolerances to abrupt deceleration show that the forces in most accidents now fatal are well within the physiological limits of survival under proper conditions.

3. Engineering improvement in safety design and restraining devices would materially reduce the injury and fatality rate (estimates range from twenty to thirty thousand lives saved annually).

4. Redesign of injury-causing automotive components is well within the capabilities of present engineering technique and would require no radical changes in present styling.

5. Many design improvements have already been developed but are not in production.

THE remarkable advances in crash-protection knowledge achieved by these research organizations at a cost of some $6 million stands in marked contrast to the glacier-like movements of car manufacturers, who spend that much to enrich the sound of a door slam. This is not due to any dearth of skill—the industry possesses many able, frustrated safety engineers whose suggestions over the years invariably have taken a back seat to those of the stylist. In 1938, an expert had this to say in *Safety Engineering*:

> The motor industry must face the fact that accidents occur. It is their duty, therefore, to so design the interiors of automobiles that when the passenger is tossed around, he will get an even break and not suffer a preventable injury in accidents that today are taking a heavy toll.

In 1954, nearly 600,000 fatalities later, a U.C.L.A. engineer could conclude that "There has been no significant automotive-engineering contribution to the safety of motorists since about the beginning of World War II. . . ." In its 1955 annual report, the Cornell crash-research group came to a similar conclusion, adding that "the newer model automobiles [1950-54] are increasing the rate of fatalities in injury-producing accidents."

In 1956, Ford introduced the double-grip safety-door latch, the "dished" steering wheel, and instrument panel-padding; the rest of the industry followed with something less than enthusiasm. Even in these changes, style remained the dominant consideration, and their effectiveness is in doubt. Tests have failed to establish, for example, an advantage for the "deep-dish" steering wheel compared with the conventional wheel; the motorist will still collapse the rim to the hub.

This year, these small concessions to safety design have virtually been discontinued. "A square foot of chrome sells ten times more cars than the best safety-door latch," de-

cared one industry representative. Dashboard padding remains one of a few safety accessories available as optional equipment. This is like saying to the consumer: "Here's a hot car. Now, if you wish to be safe in it, you'll have to pay more."

None of this should be construed as placing the increasingly popular mites from abroad in a more favorable light. Most foreign cars offer far less protection to the motorist than domestic ones.

PREVAILING analyses of vehicular accidents circulated for popular consumption tend to impede constructive thinking by adherence to some monistic theory of causation. Take one of the more publicized ogres—speed. Cornell's findings, based on data covering 3,203 cars in injury-producing accidents, indicate that 74 per cent of the cars were going at a *traveling* speed under 60 mph and about 88 per cent involved *impact* speeds under 60 mph. The average impact speed on urban roads was 27 mph; on rural roads, 41 mph. Dangerous or fatal injuries observed in accidents when the traveling speed was less than 60 mph are influenced far more by the shape and structure of interior car components with which the body came into contact than by the speed at which the cars were moving. Many fatalities have been recorded which occurred in panic stops or collisions at a speed under 25 mph. Cornell's concluding statement:

> Statistical tests indicated that even if a top speed limit of 60 mph could be uniformly and absolutely maintained, 73 per cent of the dangerous and fatal injuries observed would still be expected to occur. . . . the control of speed alone would have only limited effect on the frequency of dangerous and fatal injuries.

In brief, automobiles are so designed as to be dangerous at any speed.

Our preoccupation has been almost entirely with the cause of accidents seen primarily in terms of the driver and not with the instruments that produce the injuries. Erratic driving will always be characteristic, to some degree, of the traffic scene; exhortation and stricter law enforcement have at best a limited effect. Much more significant for saving life is the application of engineering remedies to minimize the lethal effects of human error by designing the automobile so as to afford maximum protection to occupants in the event of a collision. In a word, the job, in part, is to make accidents safe.

THE TASK of publicizing the relation between automotive design and highway casualties is fraught with difficulties. The press, radio and television are not likely to undertake this task in terms of industry responsibility when millions in advertising dollars are being poured into their coffers. Private researchers are reluctant to stray from their scholarly and experimental pursuits, especially when cordial relations with the industry are necessary for the continuation of their projects with the maximum of success. Car manufacturers have thought it best to cooperate with some of these programs and, in one case, when findings became embarrassing, have given financial support. The industry's policy is bearing fruit; most investigators discreetly keep their private disgust with the industry's immobility from seeping into the public limelight. They consider themselves fact-finders and leave the value judgments to others. This adherence to a rigid division of labor provides a convenient rationalization for the widespread amorality among our scholarly elite, who appear insensitive to the increased responsibility as citizens which their superior knowledge should require them to shoulder.

For the past three years, a Special Congressional House Subcommittee on Traffic Safety has been conducting extensive hearings on automobile design. The industry and research organizations have all submitted their testimony and reports. Some revealing facts came out of these hearings, but the press, by and large, has chosen to ignore them. In any case, the subcommittee is proceeding too cautiously for so urgent a matter. It has been too solicitous of recommendations for delay advanced by some academicians who see automotive design from the viewpoint of engineering perfection rather than as a national health emergency requiring immediate, even if not perfect, engineering remedy. Better techniques will be developed, but at least for the present, there will be added protection from remedying known design hazards. This has been the point that many safety engineers and physicians have vainly been urging.

Even if all the facts, laid before the public, did not increase consumer demand for safety design (which is unlikely), the manufacturers should not be relieved of their responsibility. Innumerable precedents show that the consumer must be protected at times from his own indiscretion and vanity. Dangerous drugs cannot be dispensed without a licensed physician's prescription; meat must pass federal inspection before distribution; railroads and other interstate carriers are required to meet safety standards regarding their equipment.

STATE motor-vehicle codes set minimum standards for certain vehicular equipment. This legislation has not compelled manufacturers to adopt known safety-design features (with the exception of safety glass), but has merely endorsed previous standards long employed by the car producers. Examples: brake requirements, headlight specifications, horns, mufflers, windshield wipers, rear-view mirrors. Thus the impact of these requirements falls primarily on the operator, who has to keep this equipment functioning. The legislative purpose is directed to accident *prevention* and only peripherally to implementing standards that might *prevent injuries*.

But state laws do not begin to cope with design defects of the postwar car which increase the *risk of collision*. Examples: the terrific visual distortion of the wrap-around windshield; leakage of carbon monoxide; rear-end fishtailing in hard turns; undue brake fade and the decreased braking area of the recent fourteen-inch wheel; the tinted windshield condemned as violative of all basic optical principles to the extent that visual loss at night ranges from 15 per cent to 45 per cent; and the fire

hazard of the undercoating and some upholstery.

Motor vehicles have been found to be poorly designed with regard to human capacities and limitations both physical and psychological. For example, there are—especially in truck cabs—unnecessary difficulties in reaching and operating control levers, in reading half-hidden dials and gauges; there are seats that induce poor posture or discomfort, mirrors whose poor placement and size impair vision, visors inadequately shielding eyes from bright light, and uncomfortable temperature, humidity and noise levels. The cumulative effects lead to fatigue, deterioration of driving efficiency and reaction time, and frequently to an accident which cannot be attributed, in the light of such poor design, to the driver.

Recourse to the courts for judgment against a manufacturer by a plaintiff injured by the defective interior design of his car while involved in an accident stands a dim chance of success. While the courts have hung liability on manufacturers for injuries due to defectively designed products, the closest they have come in motor-vehicle cases has been to hold the producer liable for a design defect instrumental in causing the accident, e.g., the braking system. The question of automotive death-traps cannot be dealt with adequately by the limited authority and resources of the judiciary, although a few pertinent decisions would have a salutary effect.

By all relevant criteria, a problem so national in scope and technical in nature can best be handled by the legislative process, on the federal level, with delegation to an appropriate administrative body. It requires uniformity in treatment and central administration, for as an interstate matter, the job cannot be left to the states with their dissimilar laws setting low requirements that are not strictly enforced and that do not strike at the heart of the malady—the blueprint on the Detroit drawing board. The thirty-three-year record of the attempt to introduce state uniformity in establishing the most basic equipment standards for automobiles has been disappointing.

Perhaps the best summation of the whole issue lies in a physician's comment on the car manufacturer's design policy: "Translated into medicine," he writes, "it would be comparable to withholding known methods of life-saving value."

My Crusade Against Football . . *by Wade Thompson*

Providence, R. I.

UNLIKE ANY OTHER sport, football is played solely for the benefit of the spectator. If you take the spectator away from any other game, the game could still survive on its own. Thus tennis players love tennis, whether or not anyone is watching. Golfers are almost churlish in their dedication to their game. Ping-pong players never look around. Basketball players can dribble and shoot for hours without hearing a single cheer. Even baseball might survive the deprivation, despite the lack of parks. Soft-ball surely would. But if you took away the spectators, if you demolished the grandstands and boarded up the stadium, it is inconceivable to think that any football would be played in the eerie privacy of the field itself. No football team ever plays another team just for the fun of playing football. Army plays Navy, Michigan plays Purdue, P. S. 123 plays P. S. 124, only with the prospect of a loud crowd on hand.

Despite this terrible need for public approval, football does not demand—or particularly welcome—a discriminating public. The football fan, compared to the baseball fan or the tennis fan, is an absolute oaf. The baseball fan, particularly, is a man of high perceptivity and learning. He has memorized a staggering quantity of statistics. He can recognize each player; he knows what each batted last year, when and where each broke which clavicle and why, and how good the prospects are for each rookie who comes along. The football fan knows nothing. He can't recognize one player from another, except by the number on the uniform. He can't tell a right guard from a left kidney. It is all he can do to follow the ball, and often he can't even do that.

The fault is not altogether his. Football is a game which simply does not lend itself to intelligent spectatordom. Even an expert, seated on the fifty-yard line, can't hope to see more than a fraction of what's actually going on. The players pile onto each other too frequently; there is too much infighting; there are too many players for the amount of room they occupy, and they have an incurable habit of bunching up. The baseball fan or the tennis fan, by contrast, can see practically everything. He can spot an error and can appreciate the grace of every movement. The players seldom get so congested as to block his vision, and he's almost never in doubt as to what is going on.

The intelligence of the football fan is weakened, furthermore, by the necessity for believing that he is seeing not just a game, but Something Important. The responsibility for that Something Important rests largely on the shoulders of the Football Coach—a man who deserves our attention because of his unique position in our society.

ON PRACTICALLY every college campus in America, the Football Coach is the most important member of the faculty. He is paid more than anyone else; he gets far more attention, and he has less to do. There is, however, an undeniable

WADE THOMPSON, who teaches literature at Brown University, once unionized the Rockettes at Radio City Music Hall.