that some will always leach out into fluids stored or run through such plastics. What is needed is an ester of low innate toxicity such as DEHP but one for which hydrolytic esters are fairly widespread in nature. Then amounts injected into patients will not accumulate and the larger quantities from industrial waste will be rapidly degraded when they enter sewage systems.

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Safer Motoring

Some years ago, when road deaths in the U.S.A. exceeded 50,000 for the first time in one year and 70% involved car occupants, the Federal authority introduced legislation governing protective design for all cars sold in that country. The need for continuous research and development was written into the specifications for design. So also is the principle that all protection shall be built into the car, thus eliminating the need for the occupants to take positive action apart from the requirement on the driver to drive the car within the limits of its crash performance. The specifications ensure a reasonable degree of integrity of the passenger compartment after all types of collisions at fairly high speeds, so that the occupants are not crushed. Having achieved the "maximum survival space," the next priority is the enforcement of a "passive restraint system." This is to become mandatory in the U.S.A. in 1975. The front runner now is the air bag system, which automatically inflates at specified crash forces and before occupants move off their seats. Its efficacy is not yet proved.

Since the introduction of the American legislation research[1 2] has been more generously supported. A few years ago Australia's legislators were confronted with a high rate of casualties, with car occupants as the main victims. The cars on the Australian market do not conform to U.S.A. standards. Consequently, seeking a prompt method of lessening their unenviable record, all the Australian States made the wearing of safety belts compulsory in January this year, and motorists will pay (except in the State of Victoria) a $A20 fine if they are caught without them. The State of Victoria introduced this compulsory law in January 1971, and in the following 12 months there was a 12·5% drop in their road casualty figures compared with a 5% rise in each of the previous 10 years.

In Great Britain approximately 40% of deaths of car occupants are now due to gross deformation or penetration of the passenger compartment on to its occupants. The existing American standards for car design would lessen that risk, but the design standards of road vehicles other than cars should also be reviewed, as should roadside environment. Perhaps the most urgent need is the abolition of the rear overhang of lorries and their loose loads, which can penetrate the windscreen area of a car,[3] though most car deaths in Britain are now caused by occupants being thrown about within a relatively intact passenger compartment or thrown out of it—the so-called "second collision." Effective restraint systems should prevent such deaths and lessen the incidence of serious injuries.

The value of safety belts in reducing the severity of injuries to car occupants has been proved by extensive laboratory and road studies in America, Sweden, and Great Britain, and the British design of lap-and-diagonal belts has been shown to be the most efficient. A safety belt should retain the wearer's trunk and pelvis on the seat during crash deceleration and not cause injury. To this end the diagonal component should fit snugly over the convexity of the clavicle and pass over the middle of the sternum down to the space between the great trochanter and the crest of the ilium, while the lap component should fit round the bony pelvis. The deceleration forces are then spread over the strong skeletal structures, and the safety belt should cause a minimum of injuries compared with those suffered by unrestrained occupants.

British belts anchored to pillar and floor in accord with present legislation meet the requirements of people of average size. For unusually large and small people they may not fit so well and as a consequence can result in injuries. There is some evidence that safety belts would fit more people if attached directly to the car's seat, and with further research and development they could be made to fit all shapes and sizes. This is a challenge to car designers rather than the safety belt industry. In fact protective car design should be built into the vehicle rather than added to it piecemeal. It might well start by making the car's seat incorporate efficient restraints for people of all shapes and sizes, all else being built round the safely packaged traveller.

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A Ball in the Eye

The eye is exposed and vulnerable, but thanks to the projecting orbital rims that enclose it and its rapid blink reflex it surprisingly often escapes direct injury. But when the missile is smaller than the orbital diameter and coming so fast that the blink-reflex cannot close the lids, the eye is likely to suffer. Thus we have a sorry catalogue of ruptured eyes from fragmented windscreens in car accidents, or of insidious damage from minute foreign bodies that derive from the use of a hammer and chisel,[1] and even the occasional direct hit from a champagne cork.[2]

Damage to the eye in ball games is happily rare, for the balls we use are nearly always too large to enter the orbital aperture, and they rarely arrive at such a speed that the blink-reflex cannot anticipate them and cushion the impact. Golf balls will just fit into an orbit, and some direct hits have been described,[3] but the smaller squash ball, ricocheting around the enclosed court, has an even greater chance of striking the eyeball. Even so 35 cases of injuries to the eye in two years from the Royal Victorian Eye and Ear Hospital in Melbourne is a formidable total.[4] From hospital statistics[5] the frequency appears to be much less in Britain, perhaps owing to the vigour, enthusiasm, and ruthlessness of squash players in the Antipodes—an interpretation that may be thought the more acceptable since in eight cases it was the racquet rather than the ball which did the damage.