

other under the front of the seat. Although the seat came adrift from its attachments, and my passage downwards was far from smooth, I sustained some general bruising only. The roof of the car had, at one stage, hit a sharp rock, and the resultant deep cleft came well below the level where my head would have been had I been strapped into the seat.—I am, etc.,

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IAN D. KITCHIN.

SIR,—Dr. A. Ward Gardner (May 20, p. 1463) raises the important point as to which type of safety belt should be worn in cars, and quotes whiplash injury to the neck as a contraindication to the use of the lap-strap combined with shoulder or diagonal restraint. It is no doubt true that this injury is possible, but Kulowski¹ and Schaefer² mention serious whiplash injury mainly in connexion with rear-end collisions. Hip-restraint alone would not prevent this injury, and, if experience were to show that it is more common with body restraint, that surely is an argument for a high seat-back rather than one against body-restraint.

The use of a lap-strap alone in British cars with their limited dimensions would give no protection against body-flexion and jack-knifing. In Kulowski's work, quoted by Dr. Gardner, head-on crash experiments by Severy *et al.*³ are described, in which, even at an impact speed of 21 m.p.h. (34 kg.p.h.), a body with hip-restraint alone suffers jack-knifing with a forward head movement of about 28 in. (71 cm.). At an impact speed of 52 m.p.h. (84 km.p.h.) head movement was found to be of the order of 52 in. (132 cm.). In our cars even the lower speed would involve violent contact of the head with forward structures of the car, not to mention chest-contact with the steering-wheel. There seems little doubt, therefore, that some form of body-, as well as hip-, restraint is essential.

In these same experiments an impact as low as 21 m.p.h. produced a maximum lap-belt loading of 5,500 lb. I would therefore agree with Dr. Gardner's implication that the British Standard (No. 3254) of 4,000 lb. for the seat-belt assembly seems inadequate. In this connexion the maximum loading of the seat-belt in crash situations occurs within about 70–100 milliseconds, and yet the rate of application of the test-load according to B.S.3254 is such as to cause a movement of the test trolley of not more than 4 in. (10.2 cm.) *per minute* from no load to full load. Perhaps the British Standards Institution would enlighten us on this aspect, but I would not have thought that this test gives an adequate reproduction of the performance of a harness under crash conditions.

According to Severy, "in contrast with the three to four thousand pound, three inch belt (1½ inch by British Standards) currently used by motorists, an 8,000 lb. loop strength, three inch wide nylon lap belt will increase motorist protection by:

- (a) Reducing contributions to slack such as those identified as belt stretch and body deformation.
- (b) Reducing restraining unit pressure applied by the lap belt to the motorist because of the greater surface area provided by a three inch belt.
- (c) Providing a restraint having a loop strength more in keeping with the loadings encountered in automobile accidents and therefore less likely to fail during impact.
- (d) Reducing front seat occupants' leg injuries by reducing belt elongation that permits the knees to contact the dash for moderately severe front-end collisions."

A full harness including lap-strap would in my view be the ideal, but when worn properly—that is, with no

slack—would in many cars restrict driver movement—for example, applying a fascia-mounted handbrake. I would therefore suggest the use of an 8,000 lb. strength combined lap and diagonal belt, and would point out that independent tests have shown a combination near this specification to be available on the market.⁴ From personal use of this harness, with anchorage points strengthened by 3 in. (7.6 cm.) diameter ½ in. (3.2 mm.) steel plates, I can testify that driver-control is unhampered and that passenger-comfort and safety, particularly of children, are greatly increased.—I am, etc.,

Great Missenden, Bucks.

D. W. ATKINSON.

REFERENCES

- ¹ Kulowski, J., *Crash Injuries: The Integrated Medical Aspects of Automobile Injuries and Deaths*, 1960. Blackwell Scientific Publications, Oxford.
- ² Schaefer, John H., *Int. Rec. Med.*, 1956, **169**, 28.
- ³ Severy, D. M., Mathewson, J. H., and Siegel, A. W., *S.A.E. Trans.*, 1959, **67**, 238.
- ⁴ *Shoppers Guide*, 1961, No. 17. The Consumer Advisory Council, British Standards Institution.

Phenazocine and Respiratory Depression

SIR,—Several of your correspondents recently have been giving their views on the use of the analgesic drug phenazocine ("narphen") as an adjuvant to anaesthesia. Much of what has been written has been on the depressant effect of the drug on respiration, and it appears that no general agreement has been reached.

I have used this drug recently as the sole adjuvant to anaesthesia, according to the technique described by Swerdlow and Brown.¹ After induction of anaesthesia nitrous oxide and oxygen were given. When respiration started returning phenazocine was given—the initial dose, 0.5–2 mg., depending on body weight. Further doses were given, as judged necessary by movement, rapid respirations, etc., during the operation. In my series 51 patients have received this anaesthetic. The average respiratory rate was 14.6 (range 8–20) and the minimum respiratory rate was 10.8 (range 3–18). Ten patients had to be given "lorfan" (levallorphan) during operation because of undue depression of respiration. I agree, therefore, with the statements made by Dr. Ronald Shaw (March 18, p. 825).

In an attempt to avoid respiratory depression 43 patients so far have been given lorfan, 0.5–1 mg., before the initial dose of phenazocine was injected. The average respiratory rate in these patients was 16.2 (range 9–23) and the minimum respiratory rate was 13.3 (range 5–22).

Your previous correspondents on this topic have been using halothane, trichloroethylene, and even muscle relaxants in conjunction with phenazocine, and in my opinion the use of these agents will obscure, to some extent, the evaluation of the effect of phenazocine as regards analgesia and respiratory depression. In my series an attempt has been made to assess the usefulness of this drug, as a supplement to anaesthesia, without the interference caused by other drugs.—I am, etc.,

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REFERENCE

- ¹ Swerdlow, M., and Brown, P. R., *Brit. J. Anaesth.*, 1961, **33**, 126.

Collapse from Reserpine

SIR,—It was good to see your annotation (April 8, p. 1022) on "Collapse from Reserpine," and I was particularly interested in one sentence: "Excretion of nor-adrenaline is reported to be reduced, but *no data are*