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The Psychological Approach to the Problem of Road Accidents*

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IT is well recognised that the problem of road accidents may be approached from various aspects, for example, the statistical and the engineering aspects. In this paper I consider the approach made by the psychologist—whose special training should render him expert in considering and advising on the part played by 'the human factor' which, it has been estimated, enters into eighty to ninety per cent of road accidents.

The psychologist cannot, of course, neglect the value of statistical data; indeed he is bound frequently to use them. Nor is he by any means unconcerned with engineering and other similar mechanical factors. But all these must be his servants rather than his masters; he has to regard them in their subservient relation to his psychological and physiological knowledge—his knowledge of the living mind and body.

Many statistical data, for example, appear to the psychologist as vitiated, if not valueless, because they have been collected and treated without the foresight of pitfalls, and without the care in framing questions, which would have been employed by one trained in psychological experiment and in psycho-physical methods.

So, too, the merely mechanical perfection, say, of car signals and of car controls (levers and pedals) does not content the psychologist. He would institute an inquiry into which of their manifold forms and positions best and least satisfy the human requirements of the driver or pedestrian; no such investigation has yet been made, at all events in Great Britain.

Or again, while recognising the proved value of traffic signals, the psychologist would ascertain their best mode, form, height, etc., again in

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relation to the human factor in their percipients. For example, it would be easy for him to overcome the dangers of defective colour-vision among road users by instituting differences in shape of the red and green traffic signals, and it appears to him worth while to investigate the problem whether the present system of unwarned changes from one colour signal to another is not deserving of improvement.

In regard to the lights of roads and cars, the psychologist is not content with the desirability of merely increasing their intensity : his familiarity with the physiology of vision compels him also to take into expert consideration the dangers of contrast, shadows, glare and the like, and individual differences in speed of adaptation to sudden gross changes in illumination.

The various traffic regulations—in respect of direction, speed and signals—are each, doubtless, individually justifiable, when based on scientific experimental evidence. The psychologist would, however, also investigate the combined, total effect of these various regulations on the driver. Is there no danger of their becoming so numerous as to impose excessive strain on his attention by increasing his distraction, and thus to enhance his liability to accident ? May they not also so seriously affect his peace of mind that, when he escapes from their zone into less crowded thoroughfares, he tends immediately, in his irritation, to reckless driving and again to enhanced liability to accident ?

The psychologist fully recognises the value of incentives and deterrents—rewards and punishments—in promoting good behaviour, but experiment and experience have taught him much concerning the value of their various forms ; and it is becoming increasingly recognised that his help should be invoked to determine whether or not an offender deserves to be wholly or partly excused from punishment or to receive other forms of treatment. This help is rendered by the psychologist not merely by inquiries into the conscious and unconscious mental and bodily make-up of the offender ; he must also investigate the remote, as well as the direct, causes of the accident—the effects of predisposing previous strain, fatigue,

worry and irritation, and of such drugs as alcohol. He would also ask to be allowed to extend his inquiries into dangerous behaviour on the part of road users which might have resulted, although it did not actually result, in accident ; and he must be in a position to recognise the mental and physical abilities and the temperamental qualities required for a safe driver, to assess those abilities and qualities, and to assert whether a driver possesses them in adequate measure for him to follow with fair safety his unquestionably dangerous occupation or amusement. Finally, he should be allowed to advise the prospective or the inefficient driver as to those of his defects, revealed by psychological tests, which might be improved by special training.

At present, motor drivers are selected merely on the basis (a) of freedom from gross physical disabilities, (b) of their knowledge of traffic regulations and signals, and (c) of their ability properly to start, stop, turn and reverse their vehicle, and to overtake, meet or cross the path of other vehicles. At present about eleven per cent of the applicants for car licences fail in this examination. But it will be at once recognised that, like most other examinations, this is one that can be passed by unsatisfactory people after sufficient 'cramming' and repeated entry, and that it is not an adequate test of the qualifications required for a really safe driver.

There can be no doubt that certain people are more liable to accidents than others. Some psychologists have assumed that there exists in various degrees among mankind one and the same *general* liability to accidents, whatever be the employment or activity in which accidents may occur. Acting on this hypothesis, the Industrial Health Research Board has devised a series of tests which have been uniformly applied to fitters, plumbers, carpenters, engineers, as well as to the drivers of certain public vehicles, with the ultimate object of eliminating those who are most liable to accidents in these various occupations. These tests are, generally and broadly, tests of the accuracy and speed of hand-and-eye co-ordination ; and, as might be expected, the scores obtained from them prove to be closely related to manual

and mechanical efficiency. Undoubtedly the ablest workers sustain the fewest accidents ; but it seems also that there really exists in every individual in a certain degree a general susceptibility to the very different kinds of accidents that may occur in widely different occupations.

Nevertheless, those who have had the most experience in vocational selection have come to place greater reliance on tests which have been devised after a special study of the conditions and requirements of the particular occupation to which they will be applied. It is therefore also a possible, and it may well be a more promising, line of research to study the special qualities required for the successful avoidance of accidents in any one particular occupation and then to devise methods for the assessment of those qualities in that occupation. This has been the method adopted by the National Institute of Industrial Psychology in regard to the selection of car drivers.

In any event, before applying them to new applicants, the psychologist will test his tests by applying them to drivers good, bad and indifferent, in order to ascertain the correlation between the scores made by them at the tests and the known frequency of their accidents on the road. This correlation reaches a satisfactory degree in the case of the Institute's methods.

The motor-driving tests which have been devised and installed at the National Institute of Industrial Psychology assess separately—speed of appropriate reaction to a given signal, resistance to distraction, the ability to 'attend to several things at once', vision, judgment of size and speed, and also self-confidence, road behaviour and manipulative ability. Although no single mental test, whatever its nature, can ever be absolutely infallible, together these tests appear to afford a sufficiently reliable criterion of driving ability. They assess certain important, innate qualities, of which some will doubtless appreciably improve with practice, but others of which are not susceptible of such obvious improvement. They do not pretend to determine that a driver who passes them satisfactorily will never be prone to reckless conduct ; but they do claim to select those drivers

who possess the necessary abilities to extricate themselves from a dangerous situation when it confronts them ; in other words, such tests when applied to the selection of drivers do reduce their liability to accident. Similar tests applied to drivers in the Paris omnibus service have, according to the most recent data published, reduced the accidents to these vehicles by 66 per cent between the years 1929 and 1933, although the number of omnibuses had meanwhile increased by 77 per cent and their speed limit by 44·5 per cent. During the same period, the total number of motor-vehicles in Paris increased by only 35 per cent, but their accident rate *increased* by 5 per cent. This difference has been attributed to the use of selection tests. No comparable data are available in Great Britain. But it is noteworthy that in the Metropolitan Police District of London, between April and the first half of August of this year, the total number of persons killed and injured from all road accidents was reduced only by about 9 per cent, as compared with the same period during the previous year ; while the number of licensed motor vehicles throughout Great Britain increased by about 7 per cent.

If the application of such selective tests results occasionally in the exclusion of good drivers, whether public or private, some hardship must be incurred individually. But surely from the point of view of the community, it is far better to inflict occasional hardships on the individual than to admit by our present far less efficient methods of selection, those who will afterwards reveal their unsuitability as drivers by injuring or killing their fellow-citizens. Even if public opinion is not ready to concede this, these tests will still undoubtedly prove helpful in the case of 'border-line' entrants to the Ministry of Transport's examination, in confirming the unfitness to drive of those whose conduct has resulted in threatened or actual accidents, or in indicating what is amiss in them and what may be amenable to correction. They will also prove useful in selecting the best applicants for driving public vehicles and vehicles owned by commercial or industrial companies.

If stringent selection is impossible, and if proper mechanical safeguards have been introduced,

training is the next most important prevention against accidents. Clearly, the pedestrian and the bicyclist cannot be selected; it is therefore essential that they, above all others, should receive instruction how to avoid accidents from motor traffic. There is one truth which the experienced industrial psychologist never tires of asserting, that no one should be permitted to pick up his methods as best he can—not even the road user! Systematic training is essential for all road users, including the car driver. Yet at present no systematic training is required even from the latter.

A still wider problem of psychological importance relates to the most effective forms of propaganda and of appeal to the public for the improvement of road behaviour. The methods devised by the industrial psychologist in market research would prove of great value here. These methods have hitherto been employed to save the waste of time, effort and expense which is so often incurred when the psychologically untrained industrialist places an advertisement or a new design or package of goods in the market in the mere *belief* that it will be commercially successful. Market research consists in ascertaining systematically and directly what the general public desires and prefers, and in ascertaining the differences in desire and preference due to sex, age, social level, etc. Experience in such market research has enabled the industrial psychologist to avoid various pitfalls which await the inexperienced, untrained person. If his methods were applied to the discovery from all angles of the most attractive, least resented forms of propaganda and appeal to the general public in regard to the avoidance of dangers on the road, this would prove to be yet another psychological approach to the problem of road accidents.

Thus there are many ways in which the special abilities and training of the applied psychologist can be utilised—in the design of traffic and car signals and car controls, in the nature and multiplicity of traffic regulations, in the illumination of roads and vehicles, in incentives, propaganda and instruction of road users, in inquiries into accidents and defective road conduct, and in the selection and rejection of drivers.