THE IMPAIRED DRIVER

By Mr. R. H. Dunn and Dr. J. H. W. Birrell

Delivered at a meeting of the Medico-Legal Society held on 4th April, 1970, at 8.30 p.m. at the Royal Australasian College of Surgeons, Spring Street, Melbourne. The Chairman of the meeting was the President, Dr. T. H. Hurley.

Mr. R. H. Dunn:

A few figures will show at the outset how important is the impaired driver in Australia.

Rough figures taken from the Bureau of Statistics indicated that there are one and a half million licensed drivers in Australia, 600,000 of whom are Victorians. There were also 90,000 new drivers in Victoria in 1969.

On road accidents the only statistics available are on those accidents which are reported to the police and these are usually accidents involving physical injury to persons.

In 1969 some 60,000 such injury accidents were reported throughout Australia, resulting in injuries to about 82,000 people and death to about 3,400. Victoria's portion was about 15,500 injury accidents with over 22,000 injured and over 1,000 killed. The number of persons killed in a year per 100,000 of population was twenty-eight. There were of course many more traffic accidents (Dr. Birrell estimates about 40,000 in Victoria) and traffic law violations.

From figures supplied by the Australian Senate Select Committee on Road Safety the cost in 1968 of reported accidents would be approximately:

Material Damage	150 million dollars
Loss in manpower and earnings	74 million dollars
Cost of treatment	7 million dollars

This gives a total of 231 million.

It is interesting to note that since 1939 Australia has been involved in 4 wars:

World War 2
Malaysia
Korea, and
Vietnam

yet there were 21,000 more deaths from motor accidents than from all four wars in the same period.

Dr. Birrell has been good enough to supply me with a copy of his notes and, with respect, I agree with the propositions he has put. It is about the first time in our professional lives that we have ever agreed—so much for the harmony inspired by the Medico-Legal Society.

However, he has taken the subjective view of driver impairment. In my opinion this is only one part of a very complex problem. In the "Current Affairs Bulletin" issued by the University of Sydney, on 9th March 1970, a very thoughtful analysis of traffic accidents and driver impairment has been written by a man trained in medicine and now professionally engaged in accident research. He points out that the focus on driver impairment and road accidents has been greatly increased in recent years—firstly, because of the sharp decline in the number of deaths from infectious diseases and secondly, because of the steep rise in the number of road deaths in the younger age groups with much greater social damage. In earlier years when medical treatment of infectious diseases was not advanced, and when transport was slower, deaths from both causes were spread more evenly throughout the age groups in the community.

He strongly criticizes the haphazard and non-scientific attitude of modern scoiety to the problem which he likens to the early attitude of medical scientists to the treatment of epidemic plagues.

Attention was first directed to end results such as fever and death and the search for causal factors which might have led to the prevention of diseases long before they were eventually eradicated was neglected. The human factor then as in accidents now, was held to blame.

Take cholera for example—it struck most severely at the poor, huddled in slums. Therefore the authorities deduced that the lower classes were subject to contagious diseases because of their filthy and immoral way of life. If they would return to the paths of cleanliness and virtue they would no longer get cholera. Meanwhile those of more favourable social situation would ward off the dread disease by the scented handkerchief pressed to the nostrils and treatment such as plugging the rectum was advocated.

Accidental injury and driver impairment constitute the plague of the twentieth century and the last mass disease of the developed world to be subject to extra-rational and unscientific

counter-measures. We still think in the old unscientific way. No road accidents without vehicles. No vehicles without drivers. Therefore it is the driver who is responsible for the accident.

Accidents must happen, therefore let us educate the driver—or punish his behaviour if his driving causes an accident—call for special "accident free" week-ends—buy St. Christopher medals—these theories are all "extra-rational" and non-scientific.

The impairment of driving is a part of the whole concept of traffic and accidents and must be dealt with in the same rational way as has proved successful in the management of epidemic plagues, and other diseases like malaria and tuberculosis.

To carry the analogy further there must be a study of:

(1) The environment
(2) The vehicle
(3) The driver and
(4) The injuries to man and material.

The human factor, although important, is only part of the scientific study and must always be considered in relation to the whole problem.

There are of course some drastic cures to the problem which modern society cannot contemplate, e.g. the abolition of cars. But within the limitations imposed by modern society there can at least be great improvement.

Taking the epidemic analogy again, in the treatment of poliomyelitis—although the virus has been discovered, nothing has yet been discovered to kill it. Like the motor car it is still with us, yet the spread of the virus has been halted by immunizing the body through vaccination and the care and rehabilitation of victims has been greatly improved.

Once the problem has been adequately defined then scientific counter-measures to the problem of driver impairment can be devised. Some of them I would like to mention.

Environment is a substantial factor in driver impairment. There are known relationships between certain road design features and accident rates.

The Freeway with its entry points safely designed and limited in number is the ideal road for efficiency and safety.

Accident rates on freeways in a number of countries are as low as 10 per cent of the normal urban intersection roadways. Such highways of course are very expensive.

Traffic engineering is still a neglected science in Victoria al-

though there are signs of improvement. It covers every aspect of traffic and road safety from road-building to speed limits—to traffic signs.

We exist in a society containing all classes of drivers—old, young, responsible and irresponsible, fit and ill. The traffic engineer seeks to develop the flow of traffic and the roads and traffic signs to a maximum of safety.

He realizes that the pedestrian is part of the environment and seeks to protect him by keeping him as much as possible away from moving vehicles.

The influence of speed limits in the environment problem is doubtful. Experience has shown that the *too slow* driver is as great as or even a greater problem than the one who exceeds the speed limit.

It has been proved that an even flow of traffic is the most important safety factor in this context.

The over-careful driver who is not prepared to take the normal risks of driving is an impaired driver. If we cannot eliminate him, then his problem must be attacked in the general problem of driver impairment. From the point of view of environment some countries can provide for a slow driver lane. In Victoria at present this is seldom feasible.

Although I do not advocate the abolition of speed limits in any way, I do not think that speed limits are a substantial safety factor because in effect they already are based on the speed at which about 85% of the public normally drives.

The vehicle itself is a substantial factor in driver impairment. The persistent attacks on safety factors in cars in the U.S.A. led by Nader have led to improvements but many more are required and are in fact being developed.

In my own experience, however, the dangerous car is the used car in an unroadworthy condition. Figures are not available of the number of accidents caused by unroadworthy vehicles but every solicitor who deals in motor collision cases will agree that the unroadworthy car is a common cause of driver impairment. A scientific study is urgently necessary here.

The safety belt system is the one safety factor that has proven its worth beyond doubt. American and Swedish studies have proven that serious injury and death are reduced by at least 50 per cent because of seat belts. This year, 1970, the provision of seat belts in new cars will be compulsory in Victoria. I think it is highly desirable that the law should provide a seat harness for every

person in the car and that the use of such harness should be compulsory at all times.

Counter-measures to driver impairment have mainly been taken in relation to the driver himself, the human factor in the problem.

As I indicated previously the lack of scientific approach has led to an unwarranted criticism of the driver. This has been accentuated by our forces of law which administer driver behaviour.

In both civil and criminal spheres emphasis is placed on a winner and a loser. The man is guilty or not guilty. The Plaintiff is right and the Defendant is wrong etc. This has been modified a little in recent years where contribution by both parties in claims for damages may be ordered.

To regulate traffic behaviour the love of lawyers to define specific issues has given rise to innumerable rules and regulations which are too dogmatic and do not allow for all the complexities of human behaviour of environment or of the vehicle itself.

In default of a more scientific approach the present system will endure but nothing irks the normal member of society more than being intercepted by a policeman on a minor traffic breach.

I agree with what Dr. Birrell has said about the factors which are known to reduce judgment, alertness, skill and concentration in their relationship to impaired driving.

I would like to add a few points:

On the physiological aspect, the studies of Mr. Foldvary of the Australian Road Research Board are important. He has taken out accurate statistics for Queensland showing the age groups of drivers involved in accidents in proportion to the mileage travelled. The figures show that drivers in the 55 and upwards age group have only 12% of the accidents of the under 20 group. However, I would have no objection to periodical physical examinations of drivers.

The young driver is the greatest human factor problem. There must be scientific research into

Experience

Family and school background

Employment, and particularly of associates and of general criminal tendencies.

Statistics show that the teen-age driver is involved in far more accidents when there are other occupants in the car than when he is driving alone. He mainly crashes at night, and especially at

week-ends. Cars and teen-age drivers are part of our present way of life and cannot be eradicated. In our permissive society we condone and even encourage their carefree and unrepressed life but when they explode their energies in motor cars, we treat them as criminals. Is this the correct scientific way to deal with them?

Contrary to public opinion, education of young drivers has not been proven of much help. Driver education schemes in the U.S.A. have reached a multi-million dollar budget but it is interesting to note in the report of the U.S.A. Advisory Committee on Traffic Safety the following passage appears:

> . . . The Committee wishes to make clear its conviction that the present state of knowledge on driver education effectiveness is so limited that notwithstanding the already broad pattern of activity in this field, and the impending further expansion, there is little to assure us that the programme will produce results commensurate with the investment.

Nor is there any proof that the enormous sums spent on road safety propaganda have shown effective results.

The most concentrated propaganda campaign of all time was probably President Eisenhower's plea for an "Accident Free Day".

A vastly expensive multi-medium nation-wide appeal was made for every American to avoid an accident on this one—just one—day. It flopped. The day's score of death and injury slightly exceeded the daily average.

I feel that perhaps Dr. Birrell is minimizing the effect of psychiatric disease. Again we have no proper research but in my experience in practice over 38 years of defending impaired drivers, I have found a substantial number whose behaviour had some psychiatric background—often of course complicated by emotional factors, by associates and by alcohol.

On the question of personality and other character factors, I find that this section of the problem is the least subject of scientific research. In a substantial number of cases of youthful driving, impairment of a serious nature resulting in dangerous driving, driving under the influence etc. that I deal with, I find that there is a background that should be scientifically investigated in relation to the problem of driver impairment—but there is no place where the problem may be explored except through a private psychiatrist whose fees are beyond the reach of many. The avenues open to the poor are very inadequate, although I must pay tribute to the efforts of Dr. Birrell and Dr. Bartholomew in this field.

On the question of alcoholism there is no doubt that it is a substantial factor in driver impairment. Exactly to what extent we do not know—but research is being directed more and more into this field. However, I make these comments. Alcoholism is now recognized medically as a disease. Yet it is punished very severely in the driver of a motor car. Is this consistent with other legal provisions which allow a defence of drunkenness to serious crimes? Is our legal approach to alcoholism too restricted—or must we make the diseased man suffer to protect other motor drivers and users of roads?

In my view, drinking and driving problems should be studied separately as much as possible. Alcoholism should be treated as any other disease. If a man is not fit to drive owing to frequent black-outs—he is not treated as a criminal but the Chief Commissioner of Police takes away his licence to drive. Should not the alcoholic be treated in the same way?

But how does the teen-age driver with just a few drinks, leading to reckless driving, fit in?

Finally, what can be done to remedy the sad lack of basic research into driver impairment and traffic accidents?

The answer could probably be found in three words: money, money, money.

At present there are numerous bodies within the Commonwealth attacking various specific aspects of the problem but what is required is a co-ordinating authority with the power and the funds to attack the problem as a whole. The Commonwealth has set up the Australian Transport Advisory Council with a number of Advisory Committees. Various State Government and University Bodies have also been set up. Last year the Commonwealth Aid Roads Act was passed and it specifically allots funds to assist in the problem.

It is high time we realized that driver impairment and traffic safety are not simply problems of human behaviour. We must first define the problems completely and then attack them scientifically.

Discussion

DR. J. H. W. BIRRELL: Impair means "to lessen in strength, vigour, quality; to cause to diminish or deteriorate". Rather a mixed up word in fact although part of its Latin derivation means "to make or grow worse". So the subject of this lecture is the driver whose quality or ability has deteriorated or diminished—but from what?

What do we mean by normal driving? And perhaps the real sixty-four dollar question—What do we mean by driving?

The answer is that we do not know. We do not have any test by which normal driving skill can be unequivocally rated. We can test behaviour patterns which are assumed to be reasonably related to driving skill; we can measure reaction times, visual and other perceptual abilities, even the very complex psychological phenomena of risk taking, attitudes and judgments. But we cannot in the present state of the art integrate these tests into a single meaningful score that can be called "driving skill" because we don't know how they react in the process of summation. Further, we don't know what weights or even kinds of weights to apply to compensatory mechanisms through which increases in one kind of skill can make up for decreases in another kind of skill. Obviously therefore if we cannot evaluate normal driving skill the job of estimating decreases in driving skill attributable to some specific stimulus is hopeless.

This then is one of the main reasons why some of the causes of driver impairment to be mentioned have relatively little known of them. One other point must be mentioned to put the matter in clearer perspective. Daily millions of people drive to and from work, millions of women drive to and from schools and shopping centres, millions of families drive to and from recreation of various types. The great majority of this driving is done safely, i.e. there is a reasonable balance maintained between getting to their destinations quickly and getting there safely without accident—if not without incident.

In other words in only a relatively small number of situations and occasions do drivers—whether through lack of skill, lack of social responsibility or for a number of other reasons—crash. Thus a crash is really a statistically rare event and an injury or death producing crash even rarer. I regret that this fact is of little comfort if you happen to have been killed or injured by a drunken, or what have you, driver.

However, it is generally accepted that safe driving requires judgment, alertness, skill and co-ordination and that impairment of any or all these faculties will be conducive to a much greater chance of crashing.

Let me now deal briefly with some of the factors which are known to reduce judgment, alertness, skill and co-ordination and see what is known about them in relation to impaired driv-

ing, and how important overall they are in overall crash causation.

Physical Disease

Medicine has reached a high degree of competence in diagnosing disease and has accumulated considerable knowledge regarding the effects of disease on objective measures of performance. However, knowledge of the degree to which disease conditions contribute to the risk of traffic crashes is poor. In fact we could almost say more is known of the influence of driving on disease if one's blood pressure and pulse rate is any guide. In fact simplification and easing of the driving task would materially assist numerous heart patients. Some studies have indicated that cardiovascular disease contributes little to deaths or serious traffic crashes. The information on diabetes and epilepsy is equivocal and often it appears that incapacity from either these diseases or from cardiovascular disease is not so sudden in most cases as to prevent a driver safely stopping his vehicle. Apart from alcoholism it would appear that popular concern about the danger of these diseases to driving is exaggerated. I find undoubted physical illness, even as an important contributing factor to crashes, to be rare.

Psychiatric Diseases

I must admit that some of the psychiatric problems which arise in drivers worry one. The man who was on the way in to broadcast the gospel from the I.C.I. building when God told him to kill himself so he drove straight into the next post. He survived because God forgot to tell him to undo his safety belt. The professor driving at 90 m.p.h. one-handed to get away from his imaginary pursuers—while he noted down the numbers of the following cars with the other hand.

The data available does suggest that some types of mental illness do have an increased crash rate compared with controls. Overall again while much more work remains to be done the contribution of mental illness does not appear a large one.

Physiological impairments

These include such factors as vision, physical handicaps such as missing limbs, hearing fatigue and the like.

Although there is a lot of information available on the changes of vision with age, the relation between deteriorating

vision and crashes is not at all clear. In fact there are records of several completely blind individuals driving successfully for a number of years and certainly there is no nice clear-cut cut-off point beyond which one can say poor vision increases the crash rate. The factor of driver self-selection may be important here in that the sensible driver realizes his vision has deteriorated and thus restricts his driving to daylight hours.

Even less work has been done on physical handicaps and hearing defects and in fact there may be negative correlations between these impairments and crashes. The role of fatigue is especially unclear because of unavailability of good measuring techniques of both fatigue and driving.

Drugs and chemical agents

Much data is available concerning the effect of drugs on objective performance measures but surprisingly little relating their use, or even presence, to crashes.

There are a lot of statements made regarding the use and dangers of prescribed drugs on driving and if one is to believe the mass media at the moment the whole teenage group is loaded with everything from "pot" to L.S.D. Waller in February in Sydney put the matter in perspective after a careful assessment of available knowledge. He found that some crashes could be attributed to drugs and impairment by drugs but with the exception of the amphetamines (the "pep" pills) drug effects are not very marked and do not result in substantial increase in the risk of crashes even amongst known drug users. Two categories of drug users do present problems but not because of drugs alone. They are the sociopaths or psychopaths of the community and the alcohol abusers. In both these groups even where drugs present the alcohol quantities are such it would not matter what drugs or amounts they were taking. I find the bromides (which are available by the bucketful over the counter) responsible for a number of crashes but often the person concerned is an alcoholic having a rest from alcohol.

The role of carbon monoxide, I regret, seems to be important only as a legal defence. The Melbourne City Coroner estimated carbon monoxide routinely in his crash deaths for many months some years ago. He gave it away when he found only two positive both of whom had burnt to death.

Personality, temperament and character factors

These are now starting to receive attention. Jamieson in Bris-

bane finds his crash responsible drivers to have inadequate family backgrounds, poor school performances, irregular employment and employment records, unstable marriages, excessive accidental injury rates at work and home and a high incidence of criminal records. Such a group would drink excessively and irresponsibly by the way. If this work is substantiated, and Jamieson's group closely resembles our Victorian drinking drivers (whether ·05 or drunken drivers) approximately 40 per cent of whom have criminal records apart from driving offences, there is a question still to be answered. How much greater does crash risk have to be among those with such traits to justify denial of a driving licence? In other words what price are people prepared to pay for safety–anarchy approaches and this question is now important.

Alcohol is the one factor which clearly stands out as a contributing factor to crashes, especially fatal ones. This factor has been documented more thoroughly all over the world than any other. With alcohol we have an objective measurement available so that accepting that alcohol impairs driving skill (hundreds of papers all over the world bear witness to this, most recently Lovibond in Sydney with his beautiful film "Danger Level") we don't have to specify the mechanism for decrease in competence or measure the decrease in competence. Again legislation dealing with alcohol everywhere is evading the problem of measuring driving skill and demonstrating its impairment using simply the objective measure of the proportion of alcohol in the blood.

The pathological drinker who in antisocial situations has levels over 150 mgms/100 mls is now receiving attention–he is responsible for possibly a quarter to one half of fatal accidents.

I am not going to traverse the overwhelming evidence now available for alcohol in large quantities playing a large part in the road crash picture. I would like just to show one hopeful feature of the situation. This is the large contribution of the heavy drinking young male. The hopeful feature is that treatment for alcohol abuse at this age is much more successful than waiting until they are middle-aged alcoholics. This means in effect that the blood alcohol level becomes vitally important, not only in screening out alcoholics on the road but must be a central feature of any alcoholism case finding programme.

Finally I should like to pose some questions and problems. Victoria has in round figures 5,000 drinking drivers charged per year–there are 4,800 odd policemen and about 40,000 crashes reported to those policemen without worrying about moving

violations. One magistrate recently dismissed fifteen drunken drivers in succession, while the coroner is continually seeing high levels of alcohol in his patients.

Why do we insist on "compartmentalizing" an alcoholic into cases of drunken driving, assault, drunk and disorderly, urinating in the street, domestic problems and work problems? If the law is interested in rehabilitation, and obviously the purely punitive approach does not work, why does it ignore all these other aspects?

Finally, a point made in a recent book on aircraft crash investigation by Stephen Barlay is a very thought-provoking one to a society such as this. Barlay suggests that lawyer advocates should be kept out of an inquiry into the cause of an air crash. When a public inquiry is necessary the technical report should be accepted and witnesses then called before an open tribunal or board. Only after this should litigation over damages and so on be allowed. He presents evidence to suggest that where lawyers have been allowed at an accident inquiry, hearings not only become dangerously protracted but the accident cause is sufficiently obscured to hinder the quest for safety. Thus if the technical work on a crash shows a piece of equipment malfunctioning in some way should this malfunction be corrected in the say other 500 planes of the same type flying before legal argument is finished?

I wonder if in fact both professions here tonight have not in fact hindered in various ways the quest for road safety.