

#M0054352 NC

T1986 ✓

NC 0021283 0



National College of Art and Design

Faculty of Design

Department of Industrial Design

PROBLEMS OF CAR DESIGN

By

Eoin Joseph Hayes

Submitted to the Faculty of History of Art and Design and Complementary Studies in

Candidacy for the Degree of Bachelor of Design in Industrial Design

February 1998

ACKNOWLEDGEMENTS

I would like to express my gratitude to Dr Paul Caffrey, my tutor for his valuable guidance and encouragement during the preparation of this thesis.

TABLE OF CONTENTS

	Acknowledgements	2
	List of plates	4
	Introduction	6
Chapter		
1.	The Importance of Styling	9
2.	Evaluation of Car Design in the 1990s	14
3.	Glocal Cars	25
4.	'Lobal' Cars	37
5.	A Possible Solution	50
6.	Implementing Change	55
7.	Ensuring Success	60
	Conclusion	68
	Bibliography	70

LIST OF PLATES

Figure

1.1	Ford Model T	10
1.2	The 1937 GM 'Y' Job	12
2.1	BMW 750I	15
2.2	1903 Mercedes	16
2.3	BMW Z3	17
2.4	Chrysler Patriot Racer	19
2.5	A car cornering	21
2.6	An animal cornering	22
2.7	A motorbike cornering	23
2.8	Citroen Xantia Activa	24
3.1	Gulfstream V jet aeroplane	26
3.2	Ford Mondeo	30
3.3	Ford Cougar	31
3.4	Jaguar X200	32
3.5	<i>Car</i> roadtest illustration	34
4.1	Chinese commuting	39
4.2	Typical forms of transport on Chinese streets	40
4.3	A 'customised' car in China	41
4.4	Mercedes FCC	43
4.5	Volkswagen proposal for a Chinese 'family car'	44

4.6	Porsche C88	45
4.7	Interior of Porsche C88	46
4.8	Mercedes joystick concept	48
5.1	Demonstrators highlighting the car's inefficacy	51
5.2	Ford Y series pick-up truck	53
6.1	Henry Ford	56
7.1	A member of the BMW / Proflex professional mountain bike team	63
7.2	Page from the 'Pop' album sleeve showing U2	65

INTRODUCTION

The motor car can be regarded as one of the most important consumer durables a customer can buy. It is perhaps the single biggest purchase a person makes apart from a house. It allows its owner the freedom of getting to different places overland in exceptionally short time compared to journeys made by horse in times past. In addition it is more flexible than rail or sea permitting scheduling of journeys.

However, viewing cars from a broad societal stance in the 1990s, some problems can be discerned. For instance, the current debate on the environment (highlighted at the Kyoto Climate Change Summit, Dec. 1997) raises concerns about depletion of the ozone layer and cars with their carbon dioxide emissions, are seen as a contributing factor to this problem. The sizeable increase in car numbers in the Western World has led to massive problems of traffic congestion, especially in larger cities. Also, increases in road deaths are concomitant of increases in vehicular traffic.

Despite all these shortcomings, cars are very popular. In addition to their functional role of personal transport, cars serve as status symbols.

Aims and objectives

The broad aim of this thesis is to explore the future development of the car from a design perspective. The objectives of the study are:

- To review how the car evolved over time
- To evaluate the current models of car manufacture and design
- To examine future possibilities for the development of alternatives to what is currently on offer
- To explore how changes needed in car design can be brought about

Overall approach to the research

In order to gather material for this study, a number of approaches were used in accessing relevant data. First of all while the writer was on an Erasmus study exchange, in Italy in 1997, it enabled him to make visits to various locations including the Lamborghini factory near Bologna; the former Fiat factory at Lingotto, outside Turin; the Geneva Motorshow; the Carlo Biscaretti di Ruffia car museum in Turin together with various other car museums. Cumulatively, these visits provided insights into car manufacturing, both past and present and gave the author a good overview and appreciation of what was happening in the world of cars. These visits provided a rich source of literature which could be drawn on in the course of the present study.

Then, in order to obtain more specific information, an in depth review of the relevant literature was undertaken. Topics covered historical perspectives; the development of the car over time; exploring the present state of car design and searching for information on possible future directions. In addition, broader aspects of design were examined. The information gathered was obtained from a comprehensive trawl of

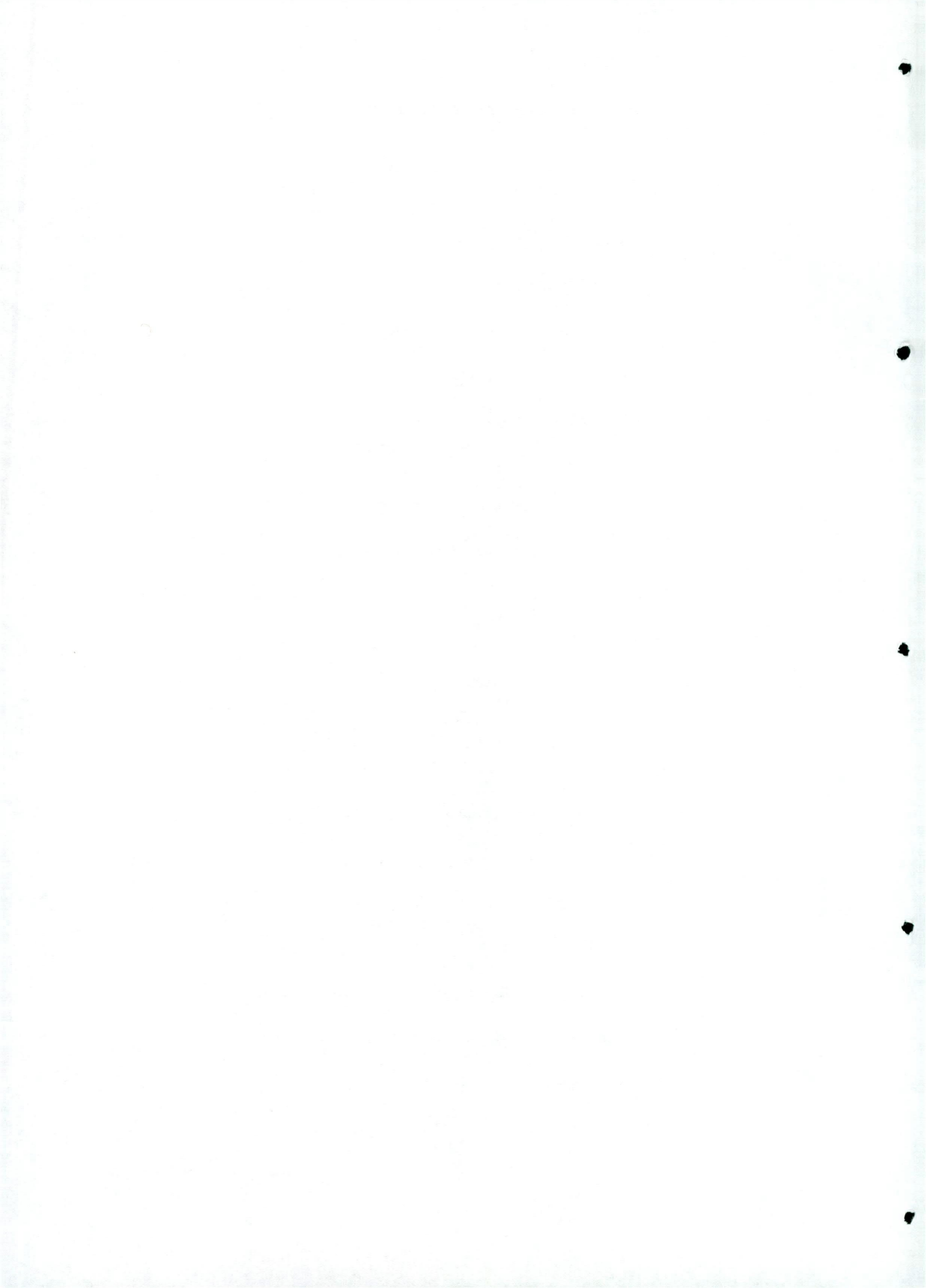
appropriate journals, books and newspaper articles as cited throughout the main body of the text.

Organisation and overview of study

Following on from this introduction, the opening chapter of the study explores the dominance of style in the car of the 1990s. Chapter 2 provides a critical evaluation of the 1990s car, highlighting shortcomings in the design. The reasons underpinning these shortcomings are explored in chapter 3.

If change is to come about, it has to start somewhere. China, with its developing economy presenting fresh opportunities for car manufacturers is identified as a possible location for introducing new concepts in car design. This theme is developed in chapter 4. However, evidence to date suggests that this opportunity to innovate is not being grasped by the manufacturers.

Moving to the future, chapter 5 presents a more radical solution to personal mechanised transport. With a view to establishing how change might be brought about in the future, the earlier success of Henry Ford in achieving quantum change in car manufacture is delineated in chapter 6. Finally, in the concluding chapter (chapter 7), some of the challenges in effecting change are explored. While accepting that change is needed, it is posited that any change has to factor in the emotional needs of the customer, in order to be accepted in the market place. Therefore style has to be a component of this change. The influence of the media in facilitating change is also touched on briefly.



Chapter 1

THE IMPORTANCE OF STYLING

Car design currently exists not in wind tunnels or in materials science laboratories, but in the library of historic images, cultural references and social nuances which constitute a brand (Bayley 1997:108).

The most important consideration in car design in this day and age is styling, as indicated in the opening quote by Stephen Bayley. The importance of styling can be seen in Paul C. Wilson's (1976) analysis of automobile styling covering a period of over 80 years from 1893 to the mid 1970s when his book was written. In his conclusion he says:

Planners in Washington, looking to the future, see cars like the Audi 50 [re-badged Volkswagen Golf for the American market] as the only out . . . If a poll were taken in 1975 to find which car the largest number of Americans wish to own, the winner would not have been the Audi 50 but would probably have been the Chevrolet Monte Carlo, a gas-greedy, 2-ton car which found an excuse for passenger's accommodations (Wilson 1976:305-306).

The History of car styling as we now know it came about in the late 1920s. Henry Ford had changed travel by manufacturing a car that was reliable and affordable - the famous Model T introduced in 1908 (fig.1.1). No other car before that gave so much to so many less well off customers. Ford made this possible by revolutionising the way cars were manufactured with the introduction of his mass production system (see Batchelor 1994). However, the Model T was ending its life cycle by the end of the 1920s as other manufacturers, including General Motors, competed with Ford

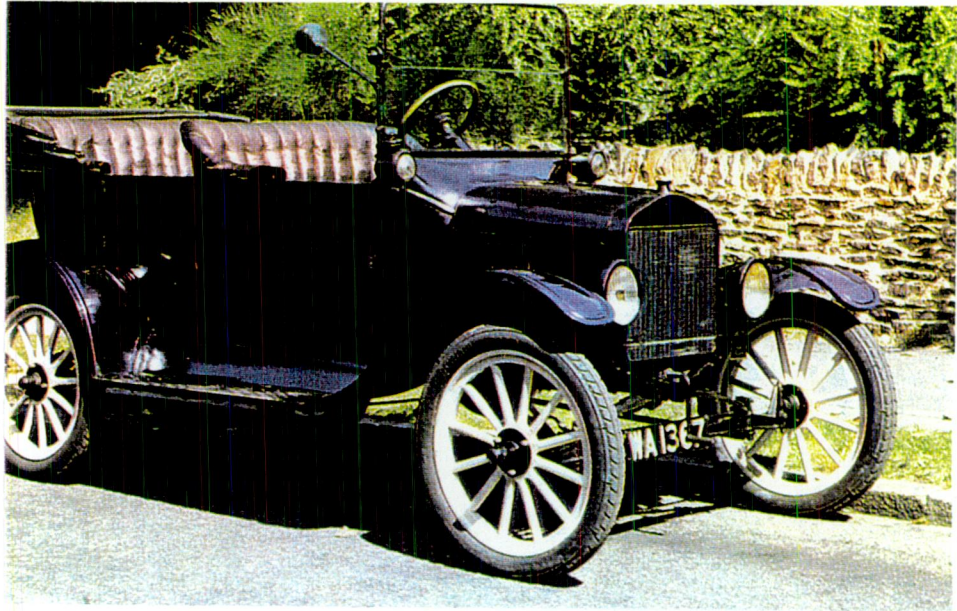
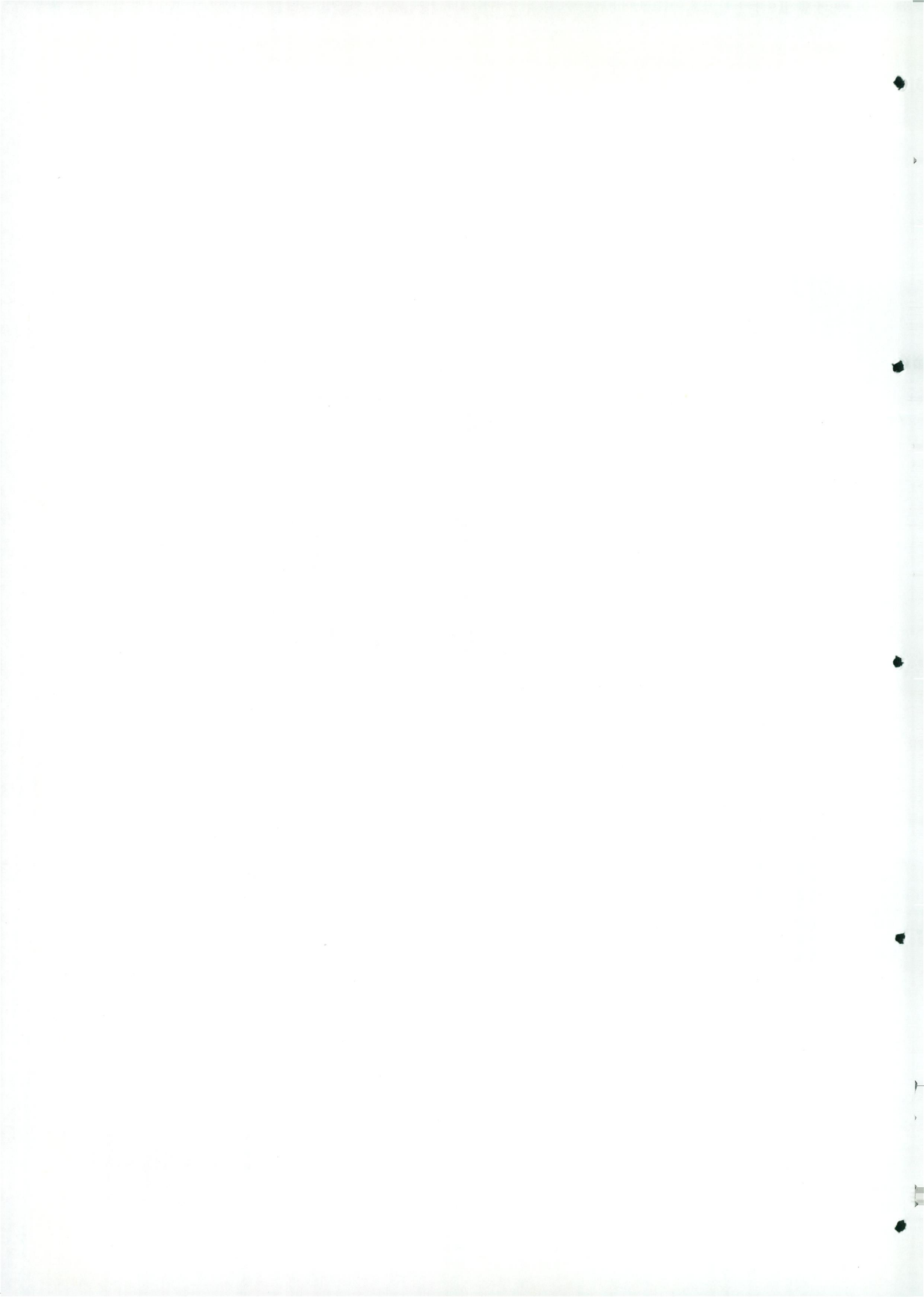


Fig. 1.1: Ford Model T



adopting his mass production system themselves. The head of General Motors, Alfred P. Sloan, gained a competitive advantage over Ford with the introduction of the General Motors Art and Color department. This was known as 'Styling' from 1938 onwards. Sloan made the famous Harley Earl in charge of this department. 'Harley Earl was employed to provide a physical foundation for the myths which the customer was invited to develop about the car he drove and the relationship to it' (Batchelor 1994:67). Whereas Henry Ford had a functionally adequate product, Sloan employed Earl to apply form to such a product and thus made it more enticing. The GM 'Y' Job in fig. 1.2 was one of Earls first 'dream cars'. Victor Papanek provides an explanation for this broader approach to styling:

In the past, people bought things because they were necessary and useful . . . We hope that the objects we possess will reflect not just our own taste, but also the taste of our times - in other words, that they will be fashionable. We also think about what meanings and status the article will provide (Papanek 1995:59).

In 1994, BMW bought the British car manufacturer, Rover. The head of BMW is Bernd Pischetsrieder and the following is an extract from an interview outlining his plans for BMW's new acquisition:

Pischetsrieder says Rover should concentrate on the Englishness of its styling, inside and out; on gentility and comfort; on the features foreigners consider desirable in cars (Green 1996:138).

The interview goes on to discuss Pischetsrieder's plans to reintroduce English motoring badges of earlier vintage such as Austin-Healy and Riely. This, together with the above use of the words 'Englishness' and 'gentility' can be described as nothing but nostalgia. Stephen Bayley (1991) in his book *Taste: The Secret Meaning of Things* describes nostalgia as the 'eighth deadly sin'. Continuing, he observes that

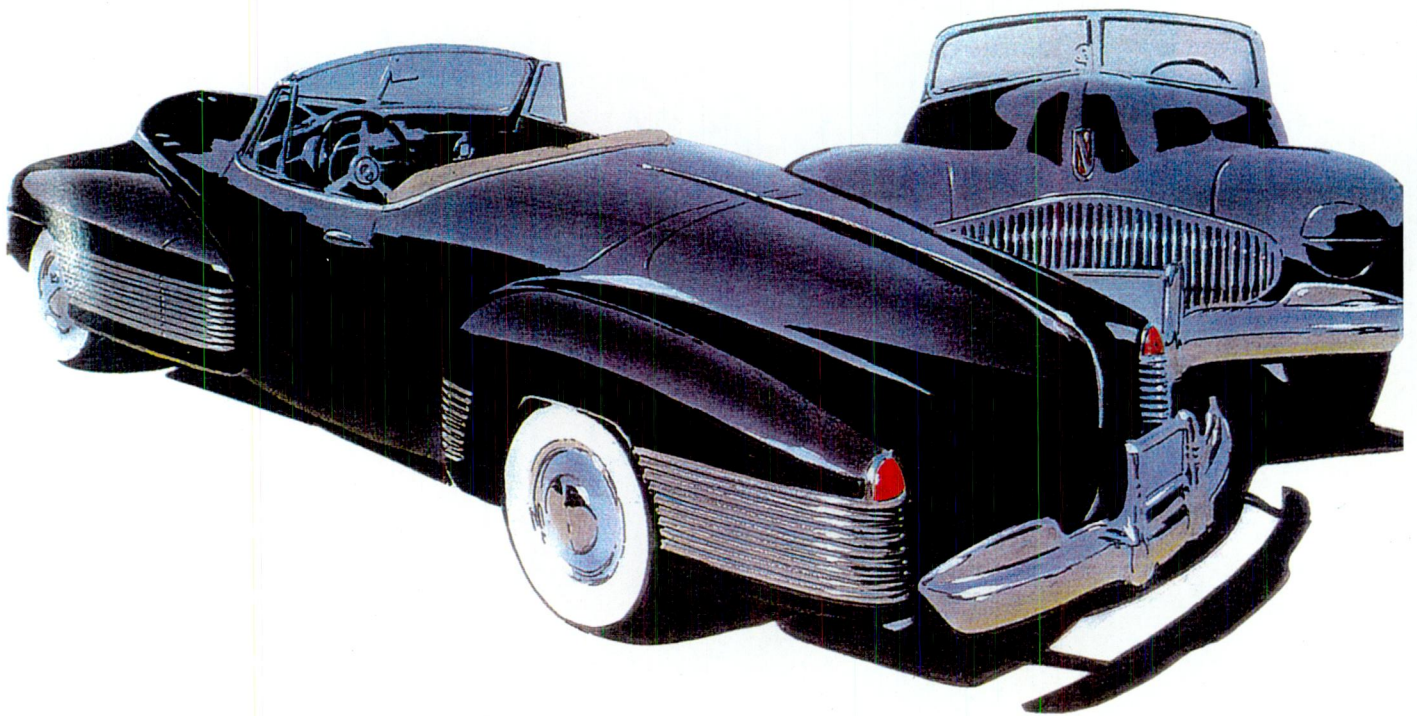
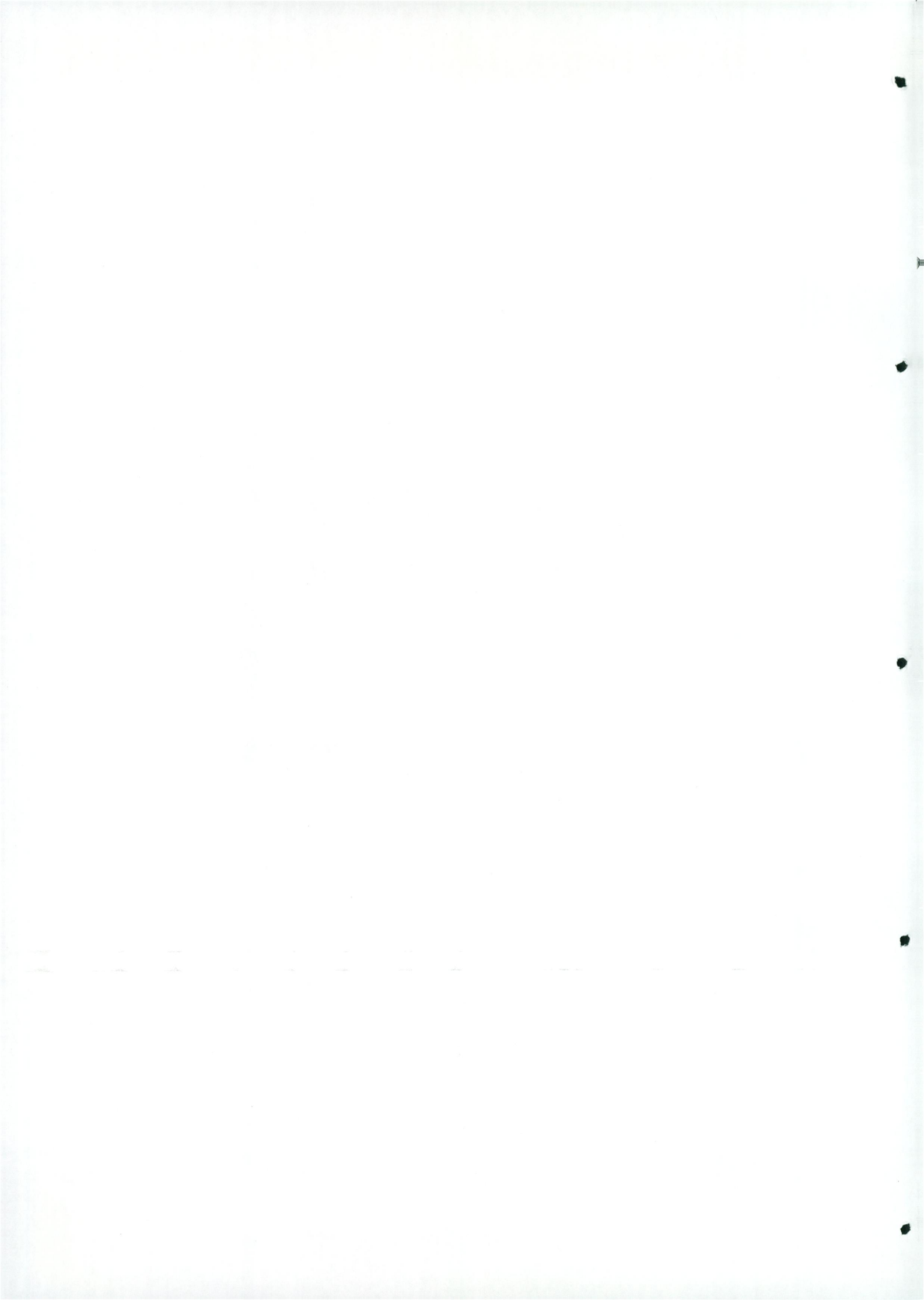


Fig. 1.2: The 1937 GM 'Y' Job



nostalgia is 'dishonest if popular; it shows contempt for the present and betrays the future. Nostalgia demonstrates a crisis in modern taste' (Bayley 1991:215).

Irrespective of the type of product, customers will always try to adorn it with decorations in order to express themselves. Individual self expression can be traced back to the cave paintings of stone age man. However, car design in the 1990s seems obsessed with the 'retro-look' that Pischetsrieder talks of and which Bayley highlights in the opening quote. In the course of this thesis it will become apparent that the innovations of Ford and Sloan were perhaps the last two great innovations in car design and since then cars, when looked at holistically, have been nothing but perfection of the Model T layout using its production formula. The mechanical evolution of the car has been little more than a perception communicated convincingly by generations of marketing teams who, in turn, direct styling departments. The mechanical inadequacies of the car are examined in the next chapter and it will be shown that the car's mechanical design is not all that far removed from the Model T and its contemporaries.

Chapter 2

EVALUATION OF CAR DESIGN IN THE 1990s

In any closed system the total amount of energy is constant (Porter 1987:88).

The most elementary school physics informs us that energy lost in one place results in energy gained somewhere else. The introductory quote is the Principle of Conservation of Energy. On examination of the standardised design for cars, it is evident that little attention is paid to this concept when a car is viewed holistically. It will be shown in this chapter that, although brilliant in dealing with many issues, the 1990s car is also lacking in many areas.

Balancing is referred to continually by car manufacturers. BMWs are perfectly balanced, with 50% of the weight resting on the rear wheels and 50% of the weight resting on the front wheels as illustrated in fig. 2.1. In order that their famous engines work as brilliantly as they do, they have to be perfectly balanced. These are fantastic cars and credited by their manufacturers as being 'The Ultimate Driving Machine[s]'. But, while some of their components may adhere to the above principle, it will be argued that the cars as a whole do not measure up.

The standardised design mentioned dates back to the turn of this century when the first Mercedes was manufactured in 1903 (fig. 2.2). Back then, there were numerous



Fig. 2.1: BMW 750i



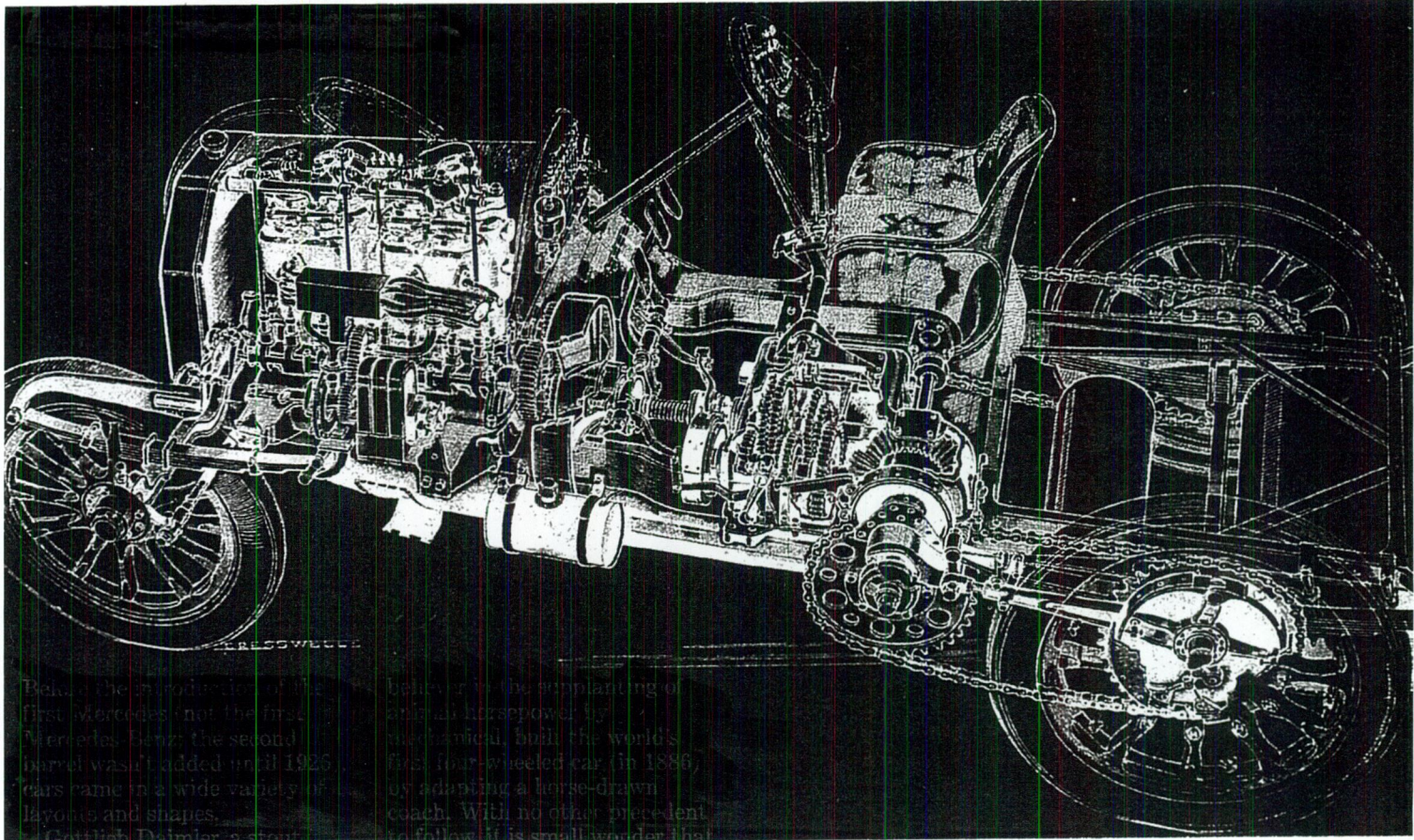
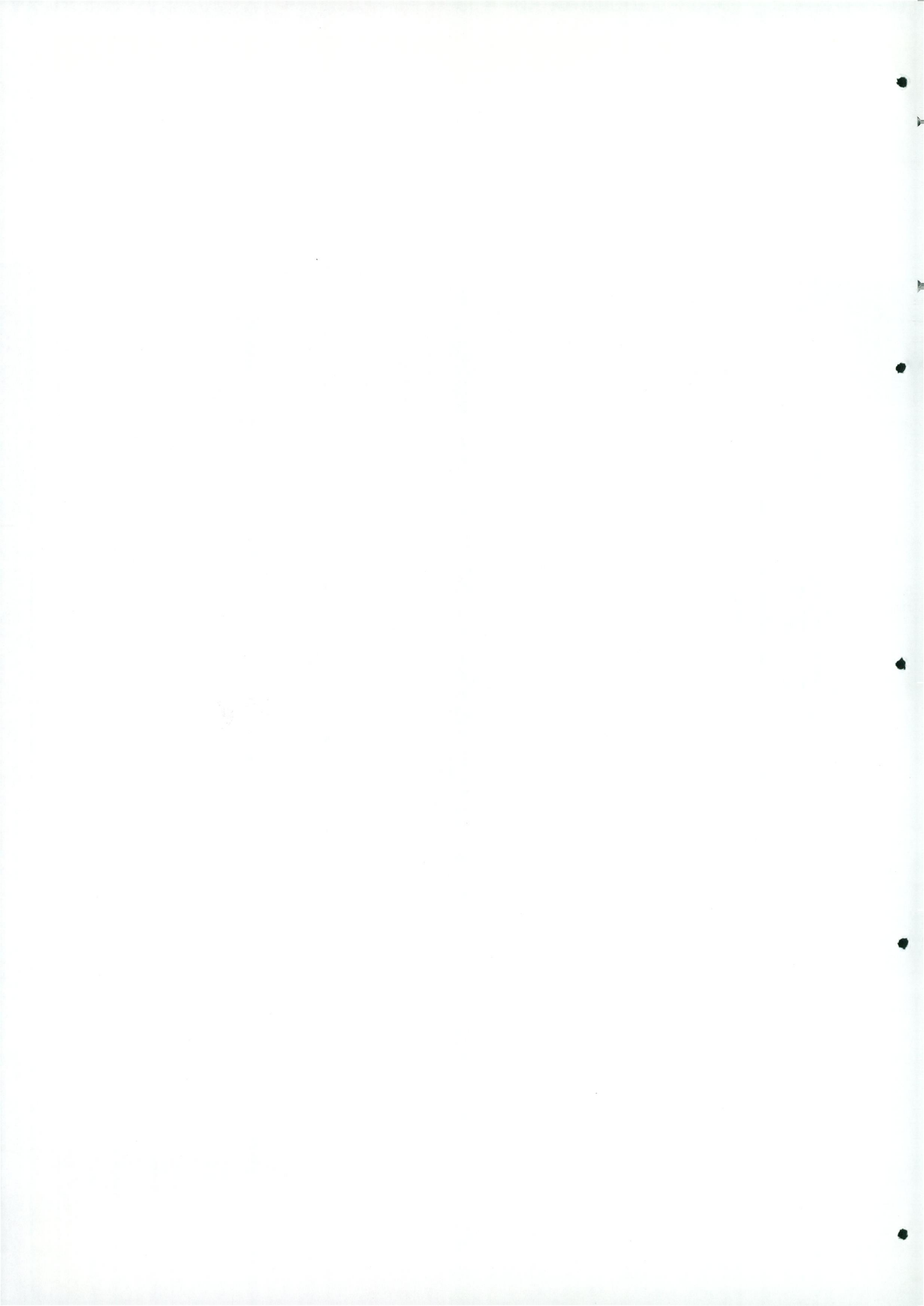


Fig. 2.2: 1903 Mercedes



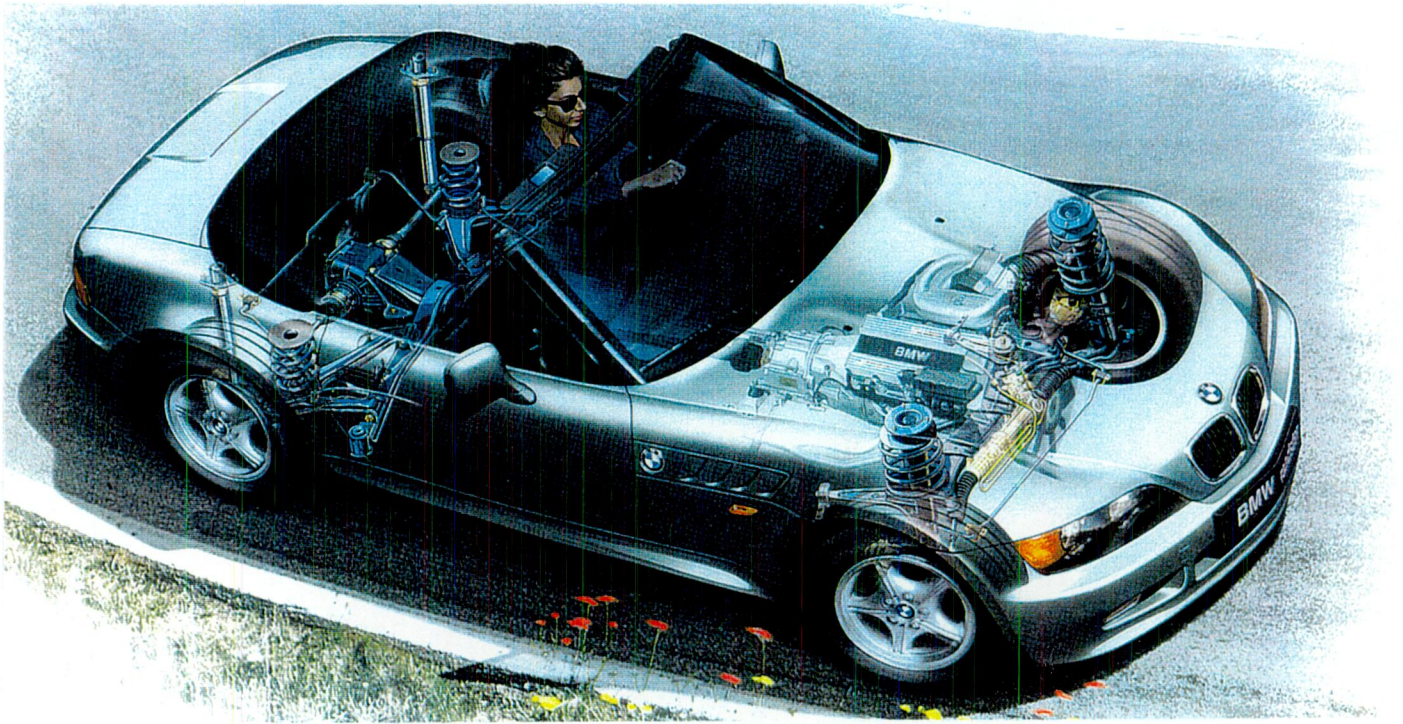
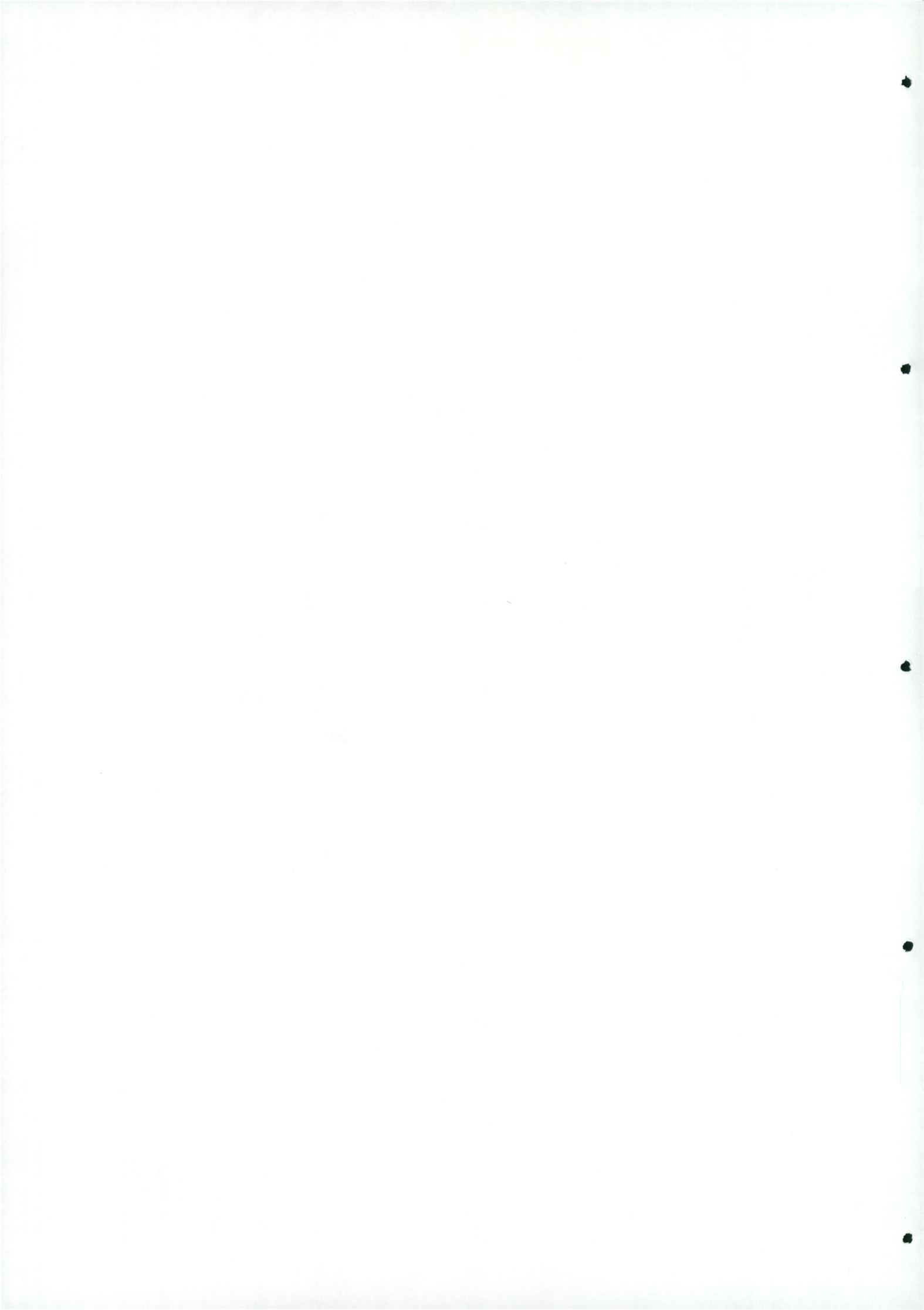


Fig. 2.3: BMW Z3



manufacturers making all sorts of horseless carriages. Michael Scarlett observes:

We shouldn't let whiz-bang electronics and bold acceleration claims [of the 1990s] distract us from the far more relevant and, at their time, vastly more progressive achievements of car pioneers during the '90s of the last decade (Scarlett 1995:274).

Upon close examination, BMW's cars, together with virtually all other cars (including the Model T), are similar in their mechanical layout to the 1903 Mercedes. This Mercedes had its engine out front with drive to its rear wheels. The car's occupants sat behind the engine and on top of the gearbox with the driver controlling the car with a steering wheel, three pedals and the gear lever. It could be argued that a 1990s BMW (fig. 2.3) is nothing but a fantastic refinement of this machine, given that its layout and controls are identical.

It is evident that much energy is lost within this standard layout. In order that cars are as refined as they are, much of their componentry is energy absorbing whereby energy is wasted. Brakes and shock absorbers are all designed to soak up and waste energy instead of diverting it back into the car.

Fig. 2.4 shows how the Chrysler *Patriot* concept racing car of 1994 stores surplus energy in a flywheel. If spinning at its 100,000 rpm limit, this flywheel theoretically could have enough energy to power the *Patriot* around 3 laps of the famous 13.4 Km LeMans 24hr endurance race circuit under racing conditions.

These savings in energy, as outlined, could be achieved in a car using a layout similar to the standard layout, but the standard layout itself could be regarded as problematic.

HOW THE PATRIOT'S FLYWHEEL TECHNOLOGY WORKS

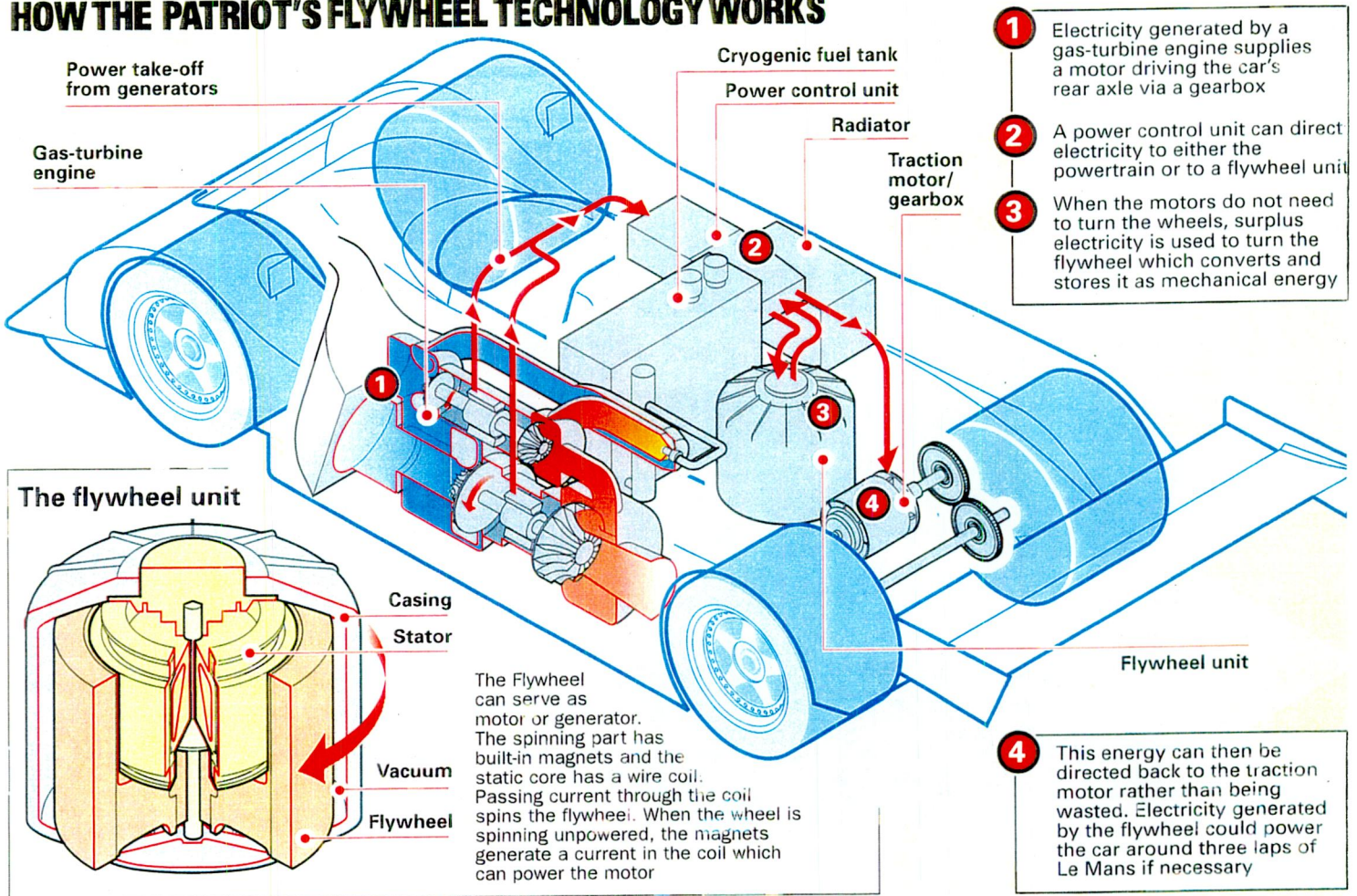


Fig. 2.4: Chrysler Patriot Racer

The ability of a car to corner is a clear example of a basic design fault of the car. On examination of fig. 2.5 we can see how the car leans onto one side and how the driver has his posture unsettled due to the inability of the machine to match its straight line speed performance with its capabilities in changing direction.

If we look at how nature deals with high-speed cornering, we can see in fig. 2.6 that the animal is leaning over on one side in order to balance out all the forces. The picture is so much more composed than that of a car cornering. In contrast to a car, the most simple of all motorised transport, the motorbike, operates on a similar principle, exploiting rather than fighting physics (fig. 2.7).

Some manufacturers have chosen to address these inefficiencies in cars such as the Citroen Xantia Activa. However, this model appears to be very adversarial towards nature. It overcomes the problems encountered with cornering using a massively complicated computer controlled hydraulic system (fig. 2.8). The necessity for such an extravagant system seems perverse when the problem is dealt with so simply by fast animals or on a comparatively simple machine such as the motorbike mentioned previously.

It is clear from this chapter that car design in the 1990s is flawed. It appears that problems which could perhaps be quite simply addressed at present have to involve complex systems on an outdated layout. The next chapter will explore why this situation exists.



Fig. 2.5: A car cornering.

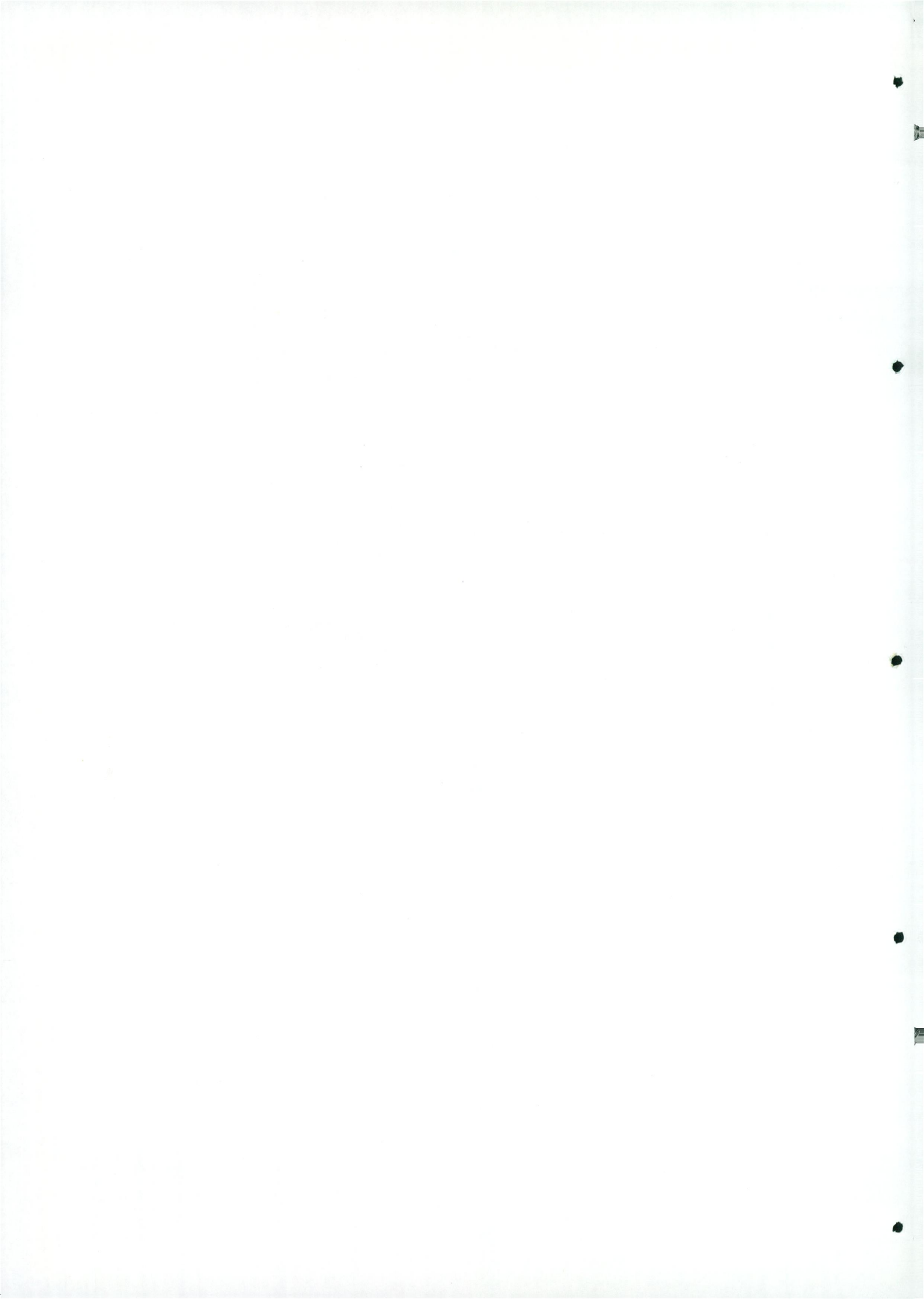
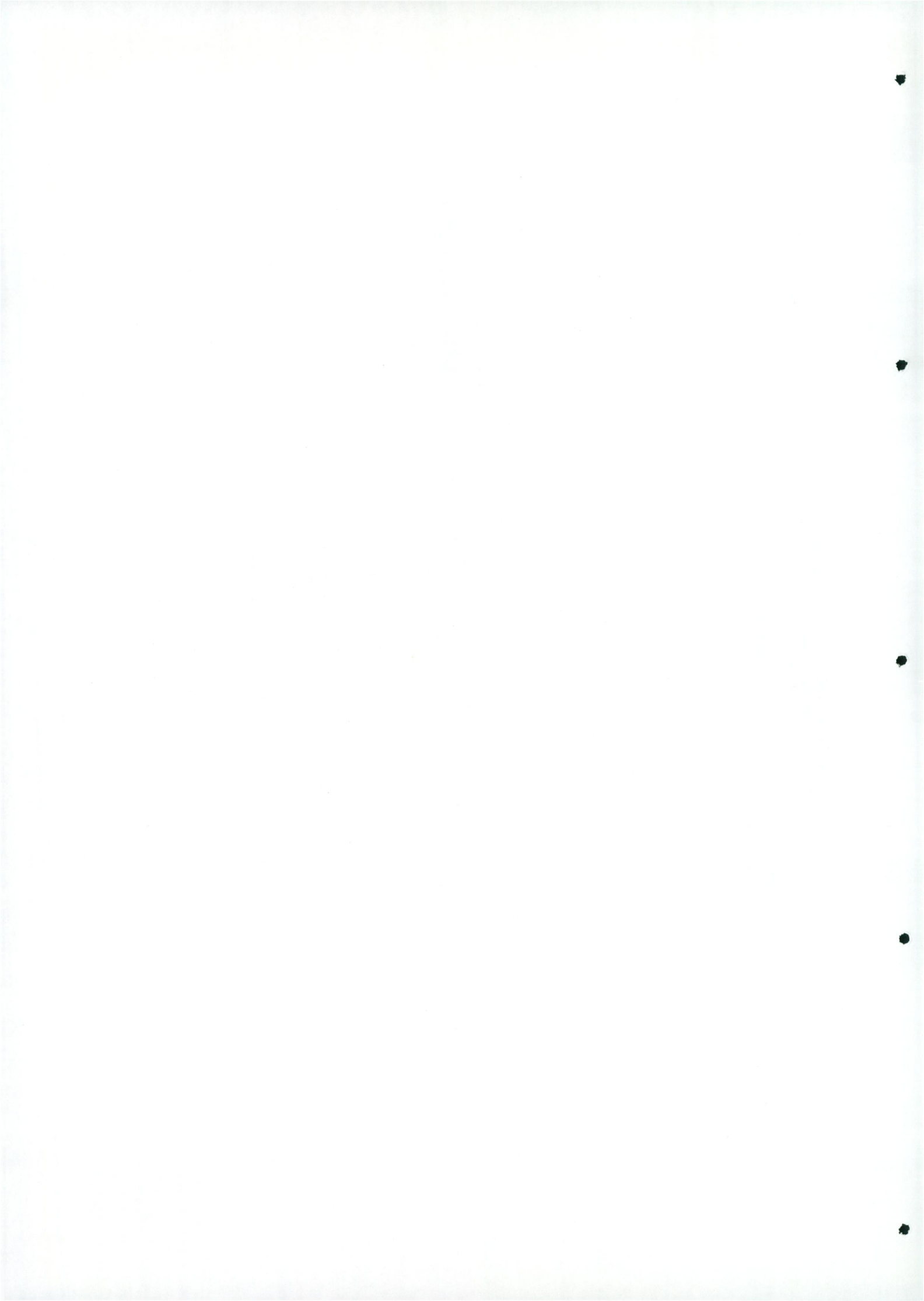




Fig. 2.6: An animal cornering.



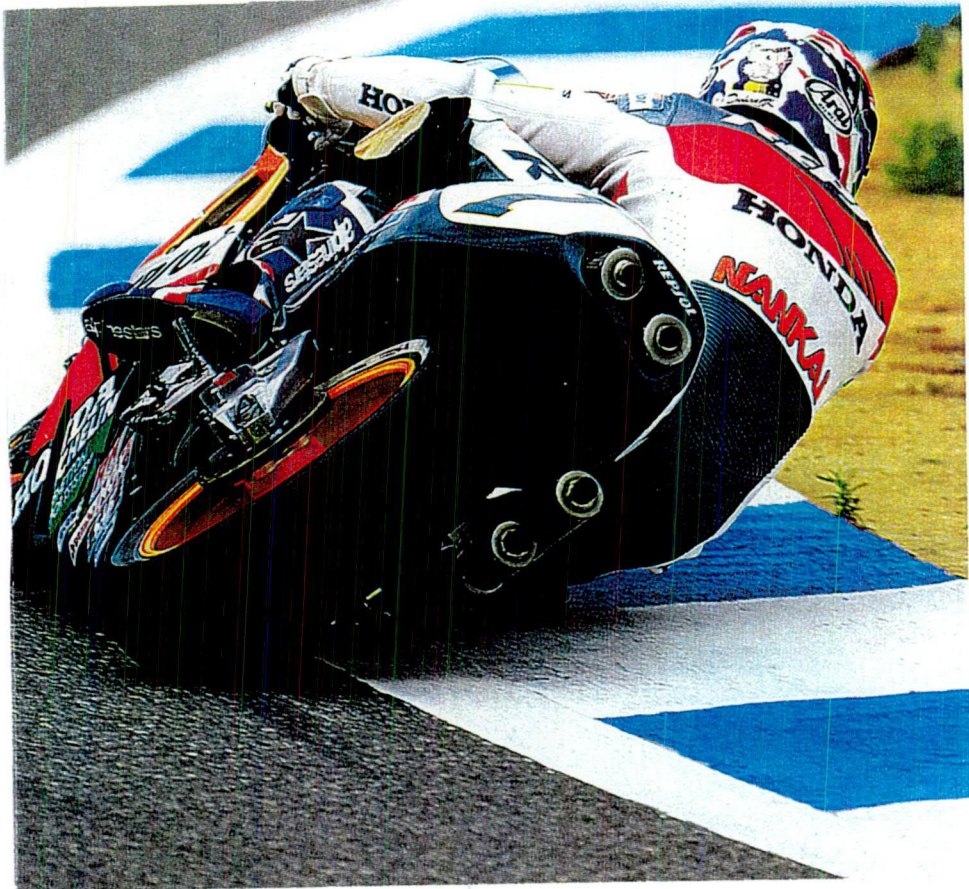


Fig. 2.7: A motorbike cornering

1 By monitoring speed and steering wheel angle, the car's on-board computer detects the start of a right-hand turn

2 The computer instantly isolates the suspension's nitrogen gas spheres, thereby doubling the anti-roll bars' stiffness

3 As further body roll is detected, the computer directs fluid to the front and rear hydraulic rams which connect the suspension to the anti-roll bars. The front ram extends and the rear retracts. This reacts against the anti-roll bars and counteracts the car's body roll

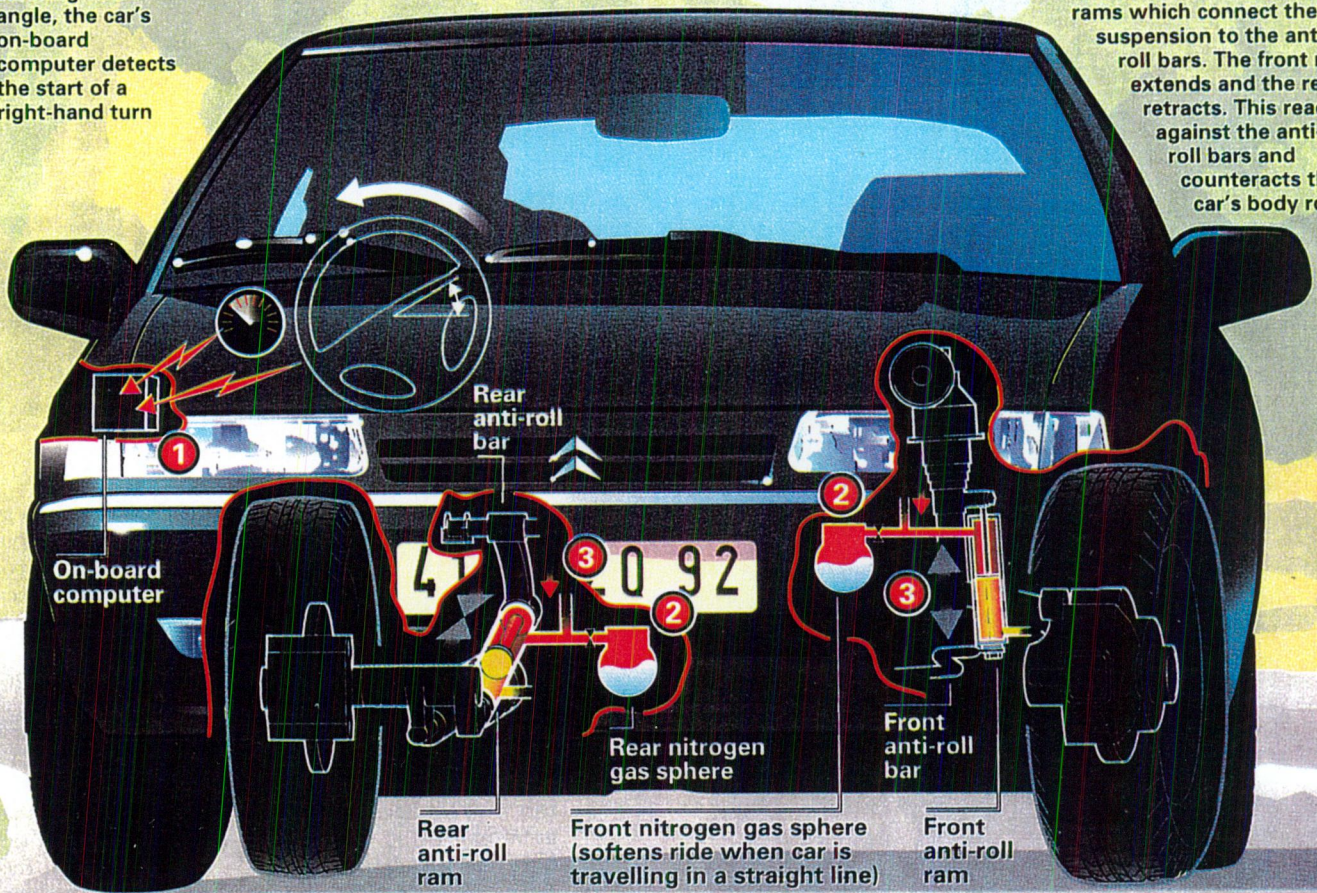
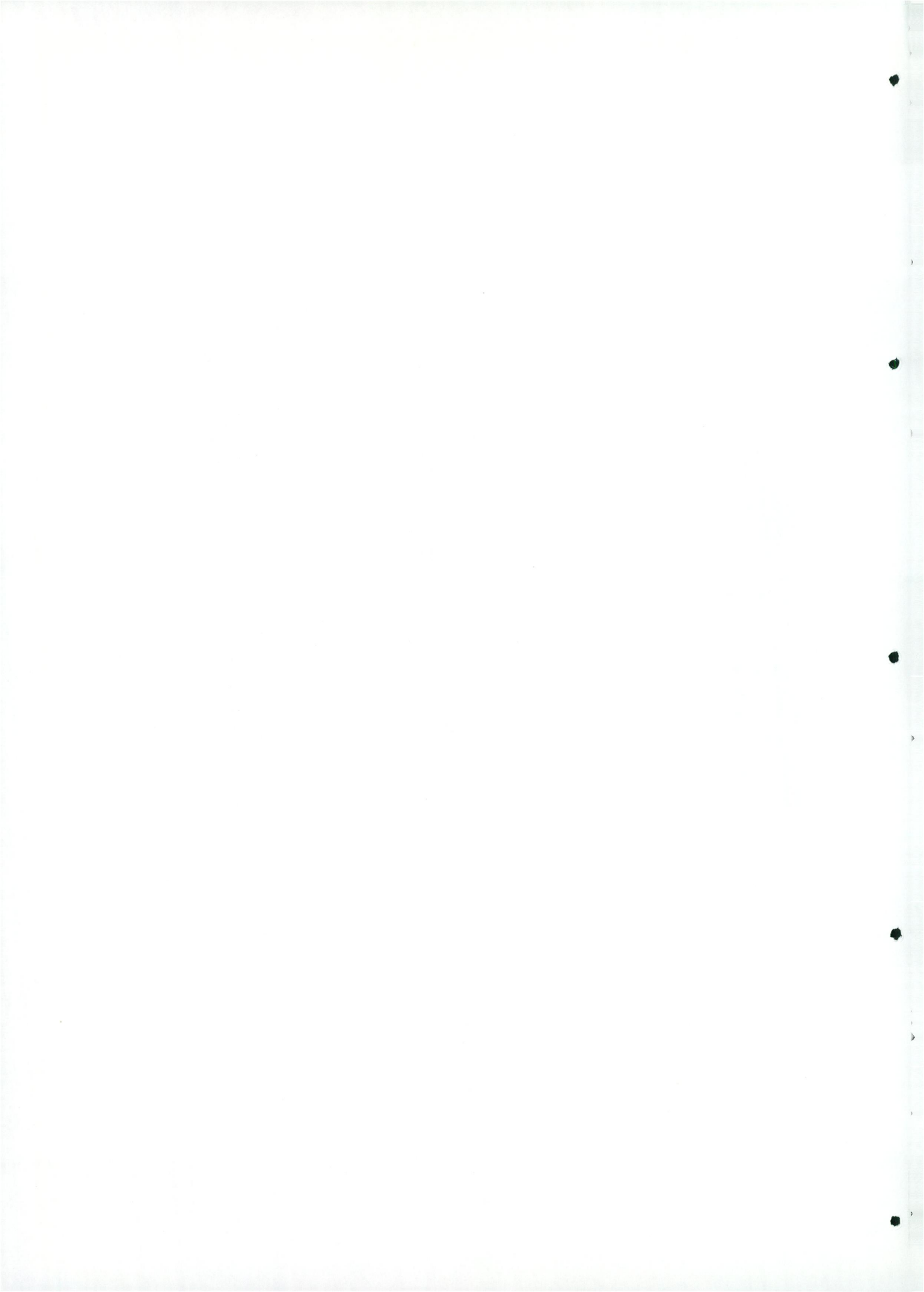


Fig. 2.8: Citroen Xantia Activa



Chapter 3

GLOCAL CARS

‘It is the very success of the car that has confronted us with all these problems’ (Cropley and Howard 1995:348).

This quote is attributed to Ford’s head of small and medium car engineering, Richard Parry-Jones, with reference to the well documented societal and environmental problems that exist with the car of the 1990s. Some of these problems were addressed at the recent Climate Change Summit conference held at Kyoto, Japan, in December 1997 and on the Channel 4 television documentary *Crash* (1998) which highlighted the appalling carnage suffered since the introduction of the car. According to this documentary, an estimated 20 million people have lost their lives in car accidents so far this century (*Crash* 1998). Although the Mercedes of 1903 mentioned in the previous chapter, together with its contemporaries, were technological marvels of their day, their capabilities outweighed their inadequacies which would only become apparent with the car’s popularity in later years and especially with the introduction of Henry Ford’s revolutionary ‘mass production’ system of manufacture.

Private jet manufacture could be considered as a modern day equivalent to the pre-mass production era of cars when car production was a craft. At the moment, production of private jets is restricted to small numbers due to the massive price of machines such as the £40 million price tag on a *Gulfstream V* (fig. 3.1). Therefore only the wealthy few can afford to buy them. Currently there are no major problems

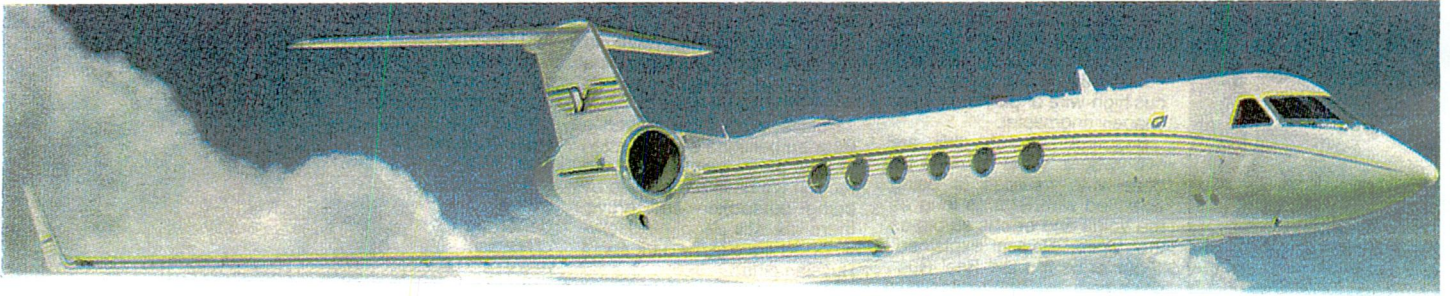


Fig. 3.1: Gulfstream V jet aeroplane.



with the number of these machines in existence. However, if a 'Henry Ford of the skies' was to arrive in the morning and started to mass produce these jets making them cheaper and thus more widely available, one could envisage many problems, with vastly increased traffic in the skies and the ensuing complications that would arise. Karl Benz is reputed to have said that there would be room for no more than a million cars on the roads in Europe in the late 1800s (*Crash* 1998).

Both a car buying customer and a car manufacturer desire the best product to suit their needs as cheaply as possible. The customer displays no concern for the manufacturer so long as s/he has a product that is (in his/her view) cheaper and better than its replacement. The cost of manufacture is redeemed through economies of scale, using a standard product. The grander the scale, the cheaper the product is to make. The relative cheapness of cars today is brought about by a handful of giant multinational companies controlling the market. They manufacture on a massive scale or 'mass produce' at a level never before achieved. So, we seem to have a conflicting situation whereby the customer wants 'more car' for less money and the manufacture wants more money for 'less car'.

It works as follows. The car buying customer of the 1990s appears to have an enormous choice. A massive range of models is available from which to choose in order to suit the lifestyle of every individual buyer imaginable. There is a standard saloon of which the world's best selling car ever, the Toyota Corolla, is a good example. For rapid transit, there are sports cars such as the Porsche 911. MPVs (Multi Purpose Vehicles) like the Renault Espace provide comfortable transport for

large families. The Land Rover Discovery is an off-road vehicle. An S-class Mercedes allows its customers to travel in style and opulence.

For the less decisive customer there are cross breed vehicles such as the Subaru Forrester which is an estate capable of light off road duties. The Audi S4 is a saloon / sports car. The Peugeot 306TDI is a 'hot hatch' with a diesel engine.

Each manufacturer also has its own personal identity which projects a philosophy behind its product range. BMW is 'The ultimate Driving Machine'. Toyotas are 'The Best Built Cars in the World'. Alfa Romeo has a Cuore Sportivo / sporting heart.

The picture so far would lead one to believe that the customer was never better treated. Marketing theory dictates that the predominant objective is to give the customer more and more choice. The customer is successfully lead to believe that this is what has happened.

However, this endless choice of products seems to have emanated from a much smaller list of independent manufacturing bodies. The brand names of Volkswagen, Fiat and Ford are subdivisions of much larger groups. For instance the Volkswagen group owns Volkswagen, Audi, Seat and Skoda. Fiat owns Fiat, Alfa Romeo, Lancia, Ferrari, Masserati and Issota. The variety of automotive brands in America are owned by the 'Big Three': Ford, General Motors and Chrysler.

One might think that this should have little effect on the choice available to the customer. However, the underlying objective of the manufacturer i.e. to get more from less, must be borne in mind.

At this point it is reasonable to assume that there are still a number of manufacturing groups which provide diversity in consumer's purchasing choice. These groups buy in their components from specialist component suppliers. For example, Toyota in the UK buys in 75% of its components (Griffiths 1997).

Now we can see that the perception of choice in the car market is little more than a perception. At this stage of its evolution the car is a mature product of a standard form. It is a necessary product for many, but the diversity required by the customer, for whatever reason, is offered through the application of applied decoration to a fairly standard layout.

The problem with the size of these major car manufacturers is that they are too big to be able to carry out quantum adaptations to their products. Products such as the 1993 Ford Mondeo (fig. 3.2) are at the pinnacle of Henry Ford's mass production system. The Mondeo is a 'glocal' product designed with a reputed development cost of £1 billion under the principal of creating a single generic car that could be manufactured in a variety of forms in order to suit different world markets. 'Think globally, act locally' is the adage which has been adopted for this model. In America the Mondeo is sold as the Ford Mercury and much of the car's mechanicals are going into variants of the Mondeo such as the Cougar (fig. 3.3) sports car and a proposed



Fig. 3.2: Ford Mondeo.



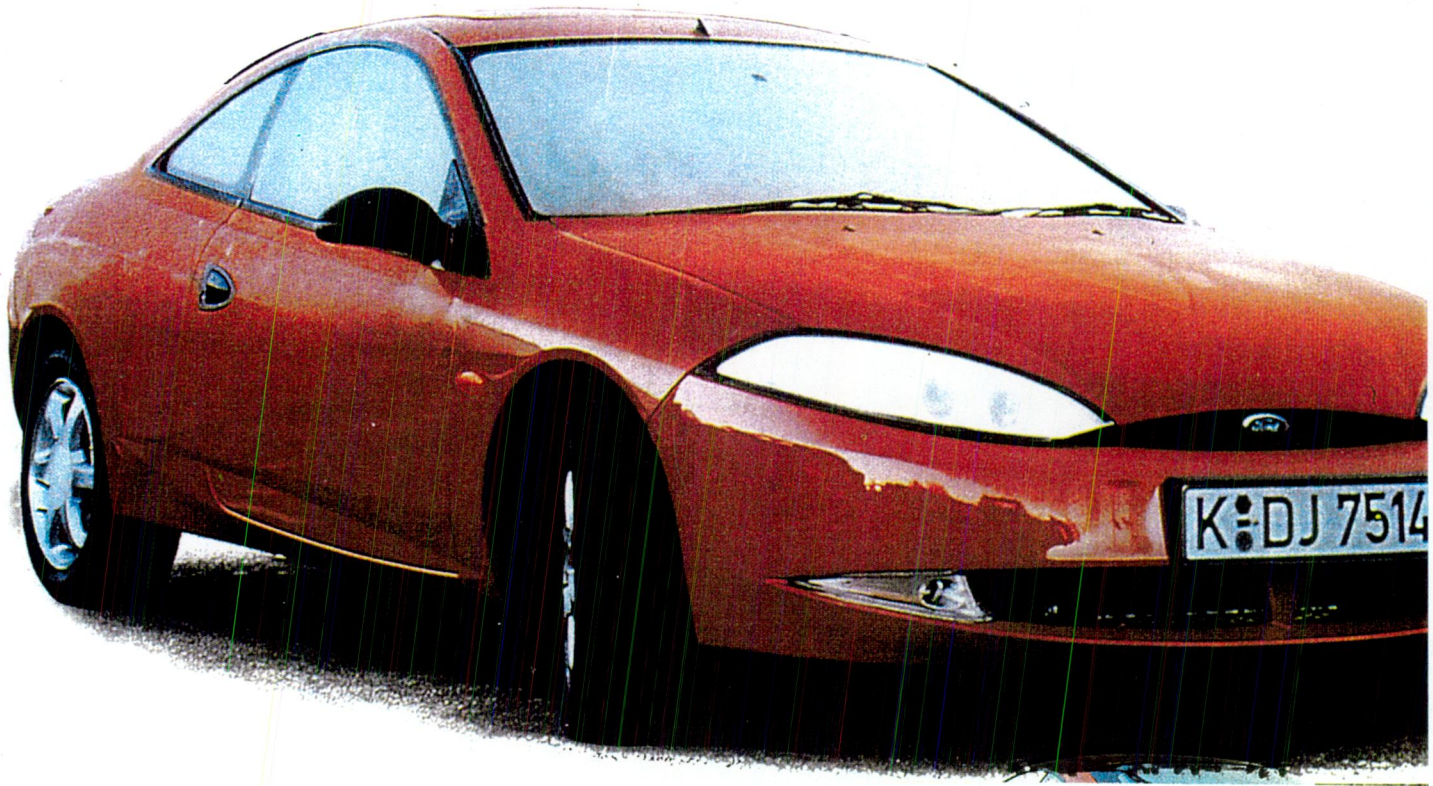
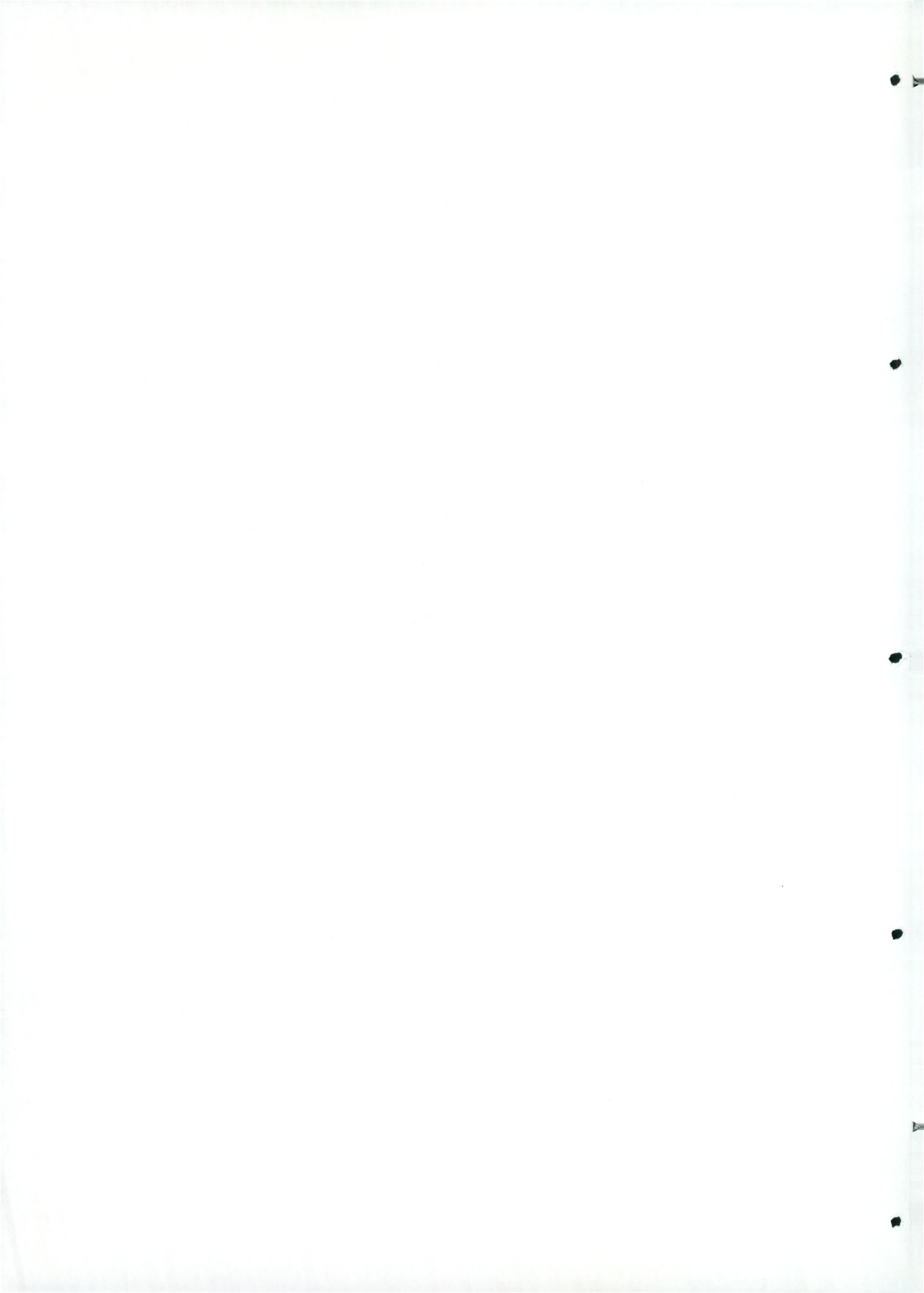


Fig. 3.3: Ford Cougar.





Fig. 3.4: Jaguar X200.



new Jaguar (fig. 3.4). So, Ford seems to offer the customer much choice but, in fact each car is basically the same, but clad in a different 'skin'.

The Mondeo has many competitors which, to a large extent are clones of itself and have been criticised for being so by the motoring Press. Cars like the Renault Laguna, Volkswagen's Passat and Peugeot's 406 are identical in almost every detail and physical capability, with the exception of subtle styling differences and a particular small idiosyncrasy that marketing teams go to town on, such as the reliability of a Volkswagen versus the handling of a Peugeot. Often these idiosyncrasies can be subliminally conveyed to the customer through the styling of the car. For example, the 'chunkiness' of a Volkswagen can portray an image of reliability whereas, Volkswagens statistically might be only as reliable as any other brand. This sameness within 1990s cars is depicted very well in fig. 3.5, an illustration for a road test in *Car* covering the Ford Mondeo, the Renault Laguna and the Citroen Xantia.

In *Stileindustria* in an article dealing with the logic of decision-making using the example of sports cars the author says that each company . . .

is watching everybody else's product actions carefully, to make sure not to "miss the boat" of a potential new trend. It is a continuous balancing act between playing it safe and to be perceived as a leader, without taking any risks (Bahnsen 1997:12).

Any major technological advances made within cars lately have been in the area of incremental tinkering with the standard product, as can be seen with the BMWs mentioned in the previous chapter. The 'whiz-bang' electronics that Micheal Scarlett mentioned, such as electric windows, ABS (Anti-lock brakes) and even



Fig. 3.5: Car roadtest illustration.

satellite navigation, are all superfluous to the standard design and they give the impression that a technological evolution has taken place. There is a massive rush to get cars to the market as quickly as possible and to respond to the increasingly fickle fashions of the market place. The best way to meet the desires of car manufacturers to have a bit of every piece of action is to have one standard product and redecorate it in response to the demands of different markets.

The reason behind this short-sightedness could be put down to the power structure within these organisations. Being based on capitalism, the guiding motive of the leaders of these organisations is profit. This is achieved by increasing sales and making the product as cheaply as possible, using the mass production system. Sir Alex Trotman, chairman and chief executive of Ford, was asked the following at the 1997 Detroit Motorshow:

“How would you like to be remembered?”

To which he replied:

“I want customer satisfaction and employee satisfaction to be better - and that’s easy to find out, because we measure both. I want shareholder satisfaction and return to improve too. That’s easy to determine as well.”
(Green et al 1997:51)

The leaders of these organisations have their leadership constrained by responsibilities to maximise returns on investments for their shareholders. It is argued that concerns for customers and employees are important only as a means of achieving profit, i.e., implementing the desire of the shareholders to whom leaders are accountable. Shareholders with their eye on the bottom line naturally favour a leader whose focus is in line with their own short term objectives. Consideration for

short term profit gains tends to dominate and to militate against the creation of a culture of change which might entail a drop in profits in the shorter term but greater long term profits and a considerably improved product.

In this chapter, some light has been shed on why the mechanical development of the car is stagnant. The chapter is an analysis of the situation as it exists. It is evident that the lack of development could be due, in part, to complexities within existing organisational structures. However, the fact remains that the Glocal car is a stale product that can only further damage the environment.

The next chapter examines opportunities for implementing change. It argues that a different approach is needed to that on offer from the multinational / glocal manufacturers since all they are offering currently is increased production of a car of unsuitable standard design. Further evidence of this is seen in the next chapter.

Chapter 4

'LOBAL' CARS

With China and other third world countries such as Brazil (see Horrell 1996) becoming wealthier and wishing to become motorised, this chapter argues that the 'Glocal' solution on offer by the giant car manufacturing organisations is inadequate and is being forced onto the customers in these countries. Once again the car manufacturers appear to be operating in the interests of short term capital gain, using minimum investment to obtain maximum return.

A 'Lobal' solution (think locally, act globally) might be more appropriate in these developing contexts. The majority of people in China have little or no experience of driving and, with the objective here being to motorise China's massive population, surely it would be an opportunity for car manufacturers to introduce something new which would develop the basic design of the car into something more up to date and suitable. It has been shown in the last chapter that the basic design of the car is inadequate, so by building a new concept for the local Chinese market, this could influence global car manufacture and thus help to develop it. It will be shown that the 'Glocal' solution is out of touch with Chinese customers.

During late 1994, the Family Car Conference was held at the China World Congress Centre, Beijing. Here 'the world's car makers pitched to win the biggest prize in motoring: the 'family car' contract to help put China on wheels' (Kacher 1995:16).



The reason for this conference comes from the desire of the Chinese government to provide motorised transport for their people. *Car* (Oracle 1995:20) says that ‘they are looking for a latter-day Henry Ford or Ferdinand Porsche, creator of the Volkswagen [Beetle], to help them’. Currently about 475,000 new cars are sold annually in China with this figure expected to increase to two million by 2004. Nissan consider that: “No maker can ignore an opportunity in a market that could be the world’s largest in 20 years” (Oracle 1995:20).

Surely, this would be an ideal situation to introduce novel new technologies and solutions that would address the inadequacies of the car as the western world knows it. Could China not be a clean sheet for a new design of car that could influence the rest of the world to change? This would be of benefit to the Chinese, first of all, and then to other parts of the world after it is seen how beneficial this situation has been in China.

If we look at the current transport situation in China (fig. 4.1), we see that the country has 270 million bikes and less than a million cars. (Ballantine and Grant 1992). A 38-year-old Chinese computer programmer Zhong Jin, who attended the Family Car Conference exhibition said:

I make 800 renmimbi (about £57) a month. My dream vehicle is a Flying Pigeon touring bike with Shimano gears. That’s all I can afford, and will realistically be able to afford for many years (Kacher 1995:19).

Fig. 4.2 depicts typical forms of transport that may be found on Chinese streets. Fig. 4.3 from the journal *Stileindustria* shows a “customised” car with a rich sequined cloth, reproducing even the number plate according to traditional motifs. These

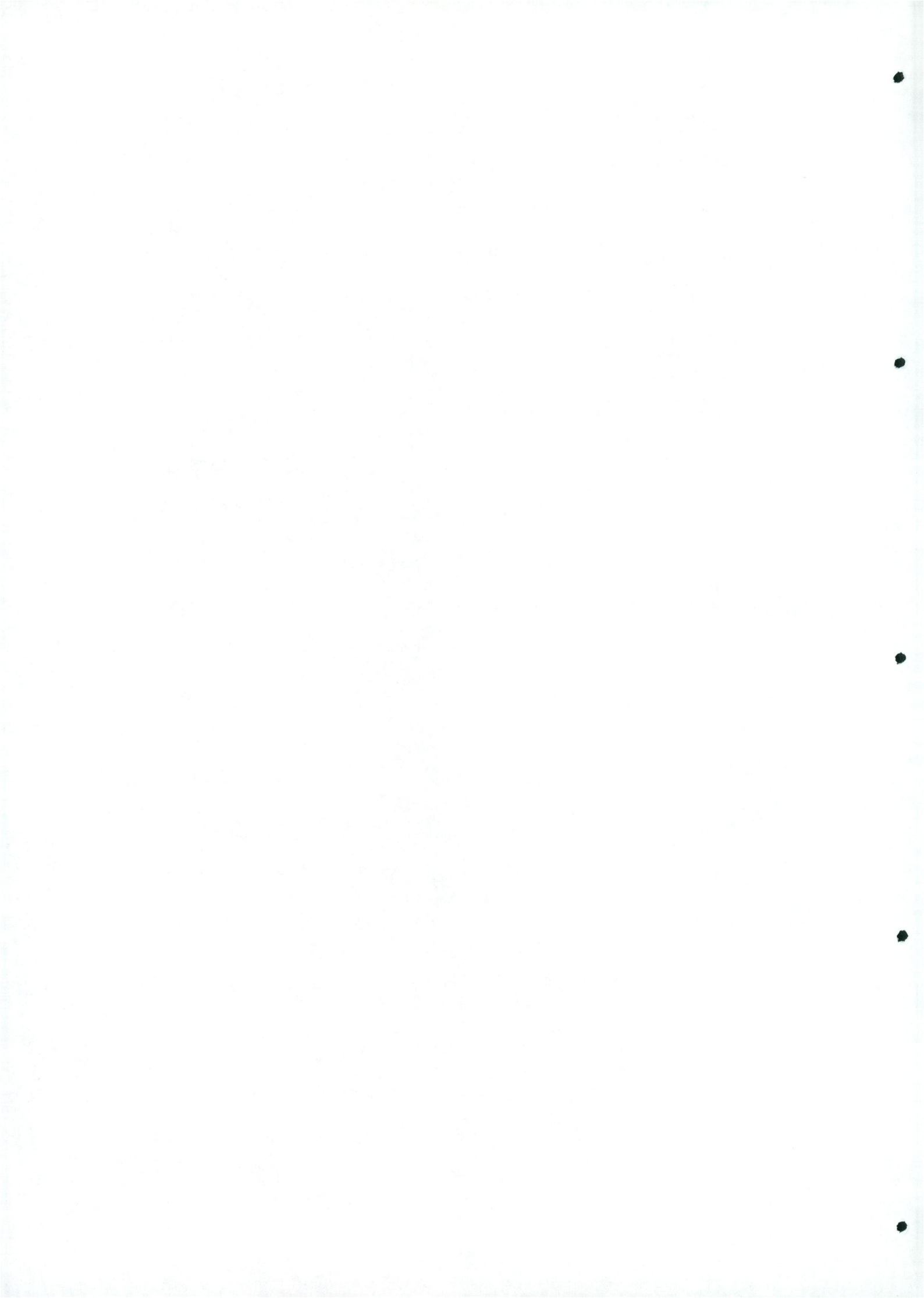




Fig. 4.1: Chinese commuting.

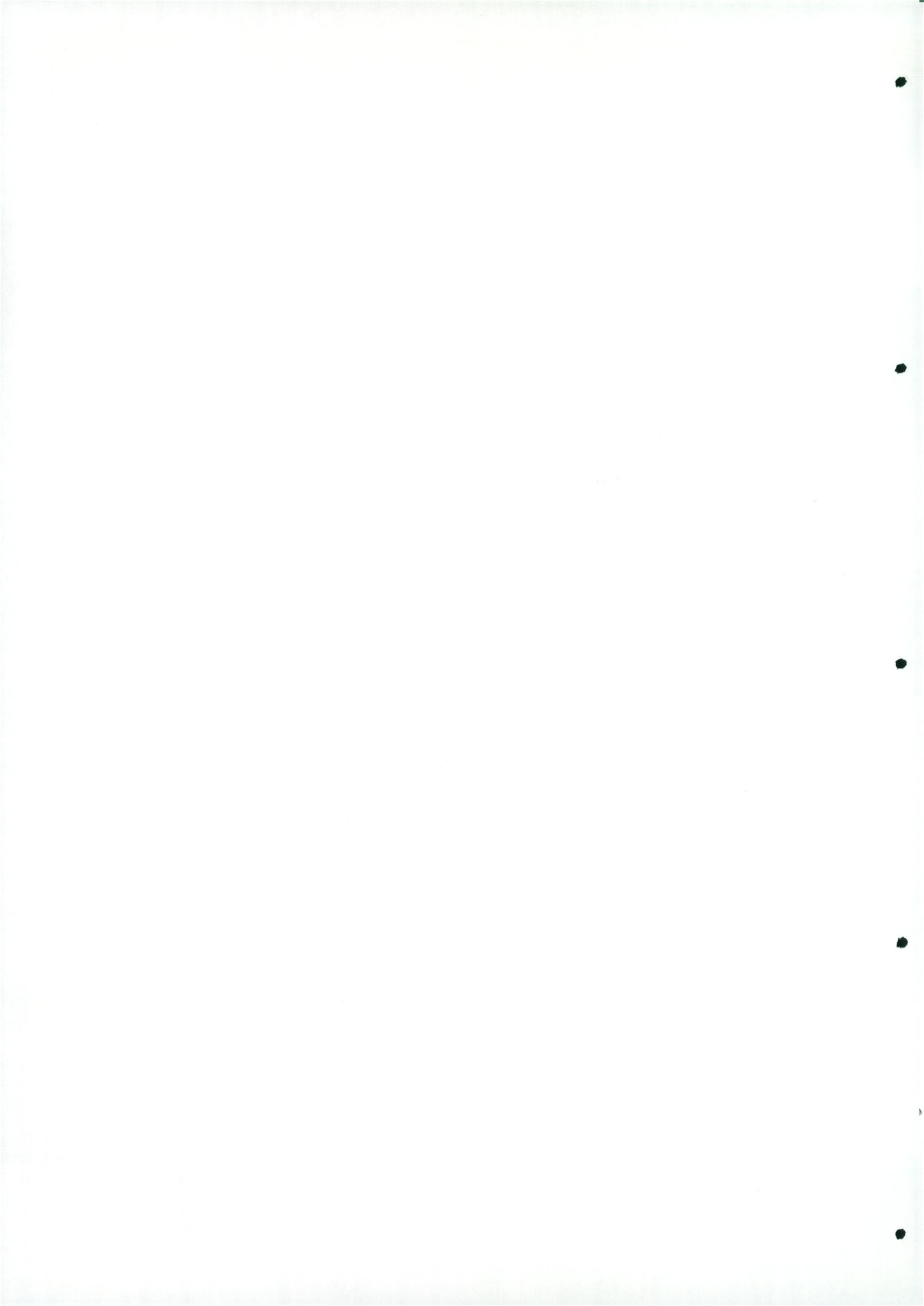




Fig. 4.2: Typical forms of transport on Chinese streets.



Fig. 4.3: A 'customised' car in China.

examples show us that the Chinese people probably do not have a strong pre-conceived notion of what a car should look like, so something more suitable than those presently on offer in the Westren World could be sold to them. This could be a product that addresses the problems outlined in chapter 2 and some other problems associated specifically with China. A completely new system of transport could be introduced which does away with the complications in which the car, as we know it, has embroiled itself.

However, the car manufacturers have come up with what we would expect. Mercedes showed the FCC (Family Car China), a five door car based closely on the European A-class (fig. 4.4). Volkswagen offered a VW-badged Seat Cordoba (fig. 4.5), the Cordoba itself being a reskined VW Golf. Porsche provided the C88 (fig. 4.6), regarded by *Car* as being the most novel solution because of its simplicity. Here, we witness nothing but badge swapping and the hard selling of a very 'stale' product.

The philosophy behind Porsche's project C88 is described as follows:

Project C88- follows the same philosophy as the Volkswagen Beetle, which was developed by Ferdinand Porsche 50 years ago. It's a light, simple, versatile vehicle, which could be built easily and inexpensively. It is designed to motorise a nation of non-motorists (Oracle 1995:21).

The philosophy behind the design of this car goes back to Hitler's vision of transport for the people. Hitler hired Porsche to design the car. Hitler was an admirer of Henry Ford (see Batchelor 1994:30). So, again we have an 'innovative' new car whose design origins go back to the Model T.



Fig. 4.4: Mercedes FCC.

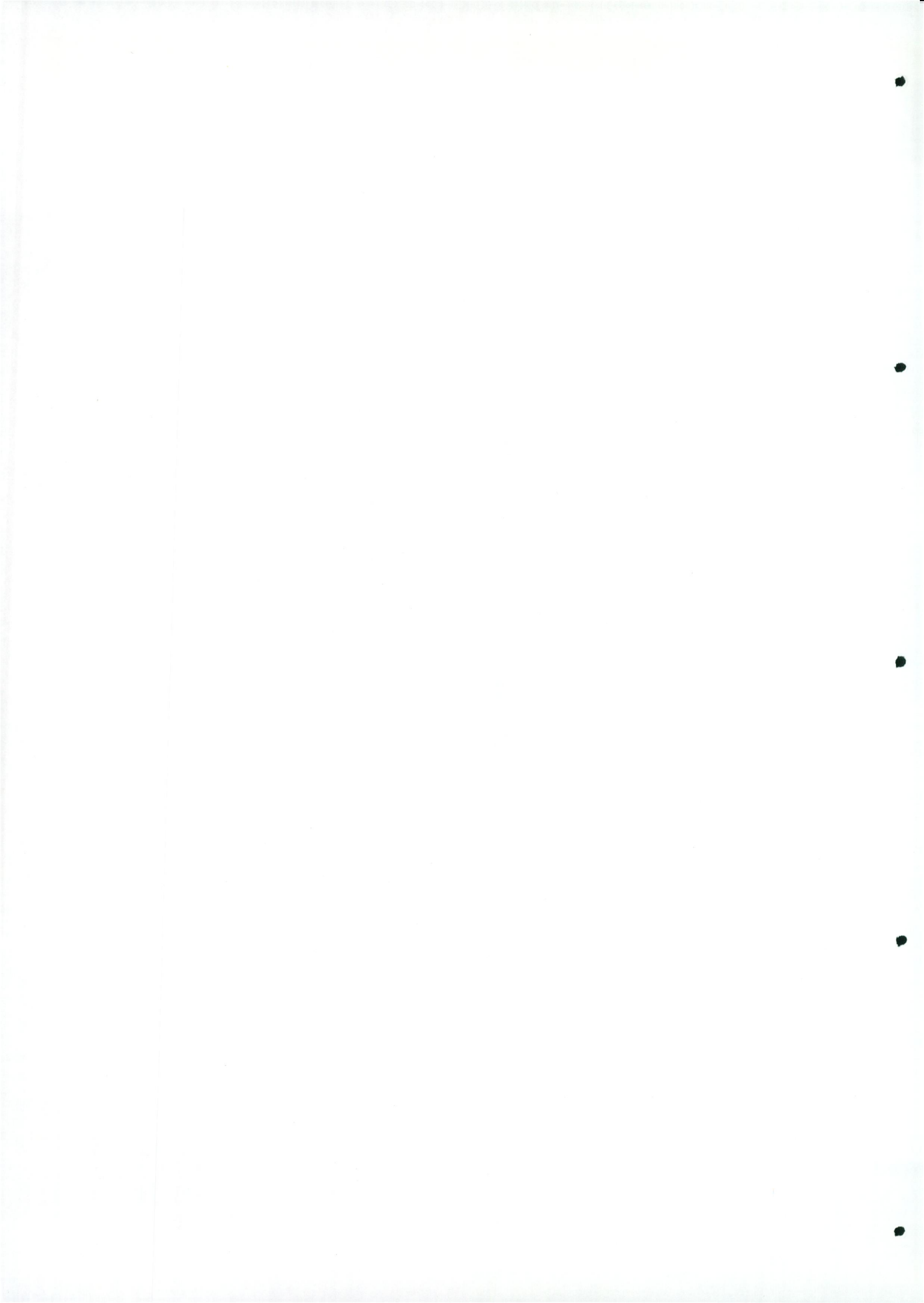




Fig. 4.5: Volkswagen proposal for a Chinese 'family car'.

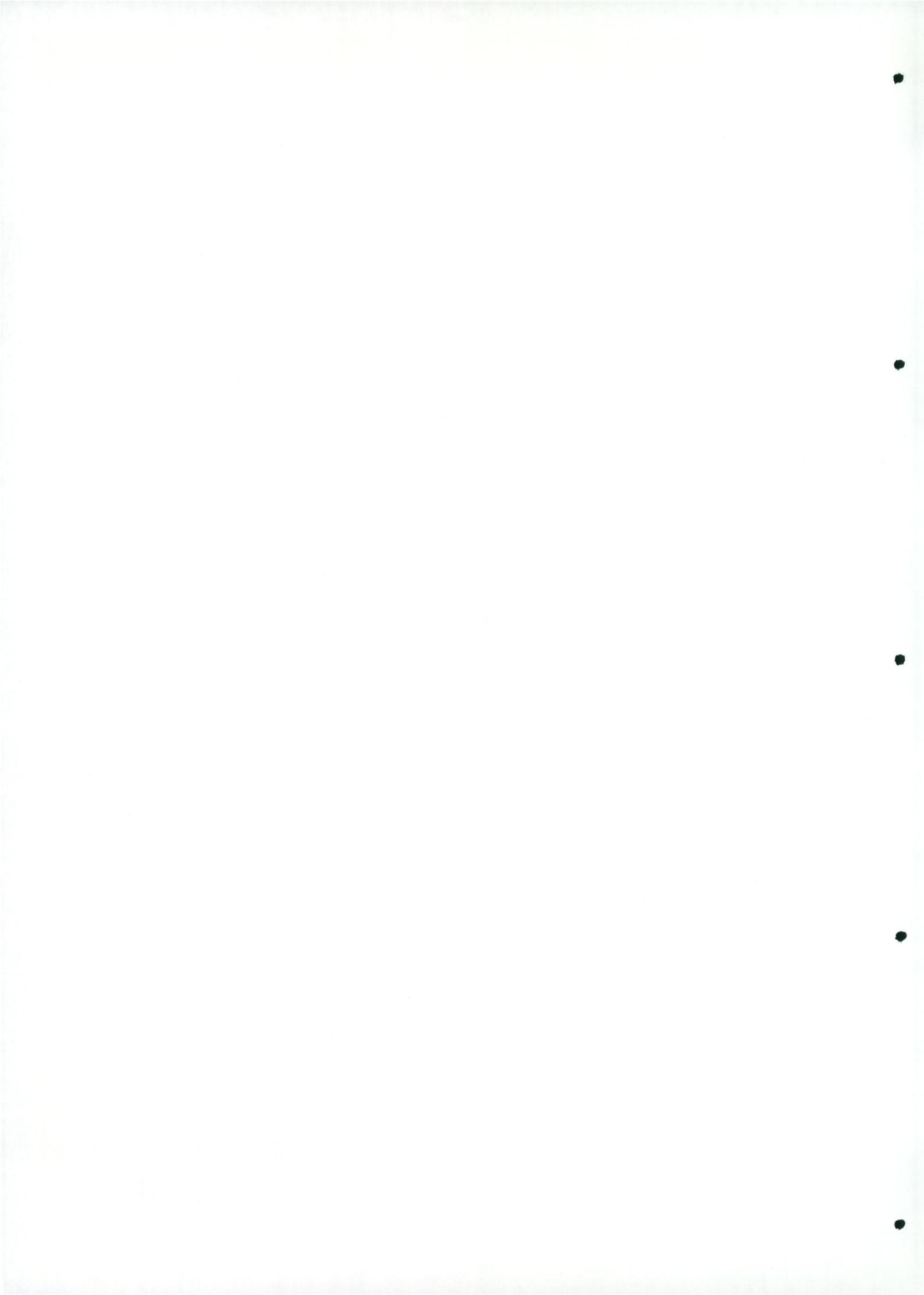
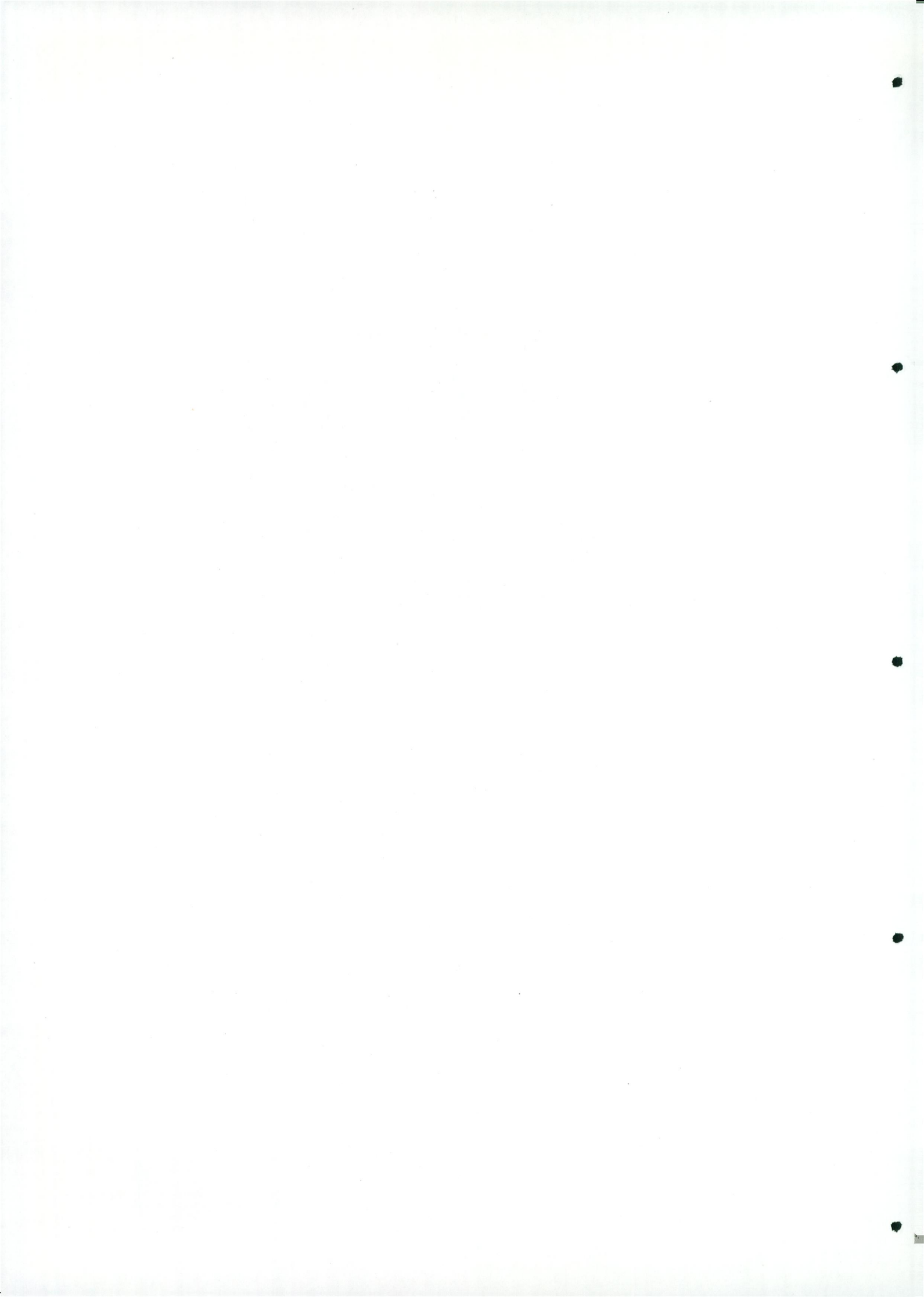




Fig. 4.6: Porsche C88.



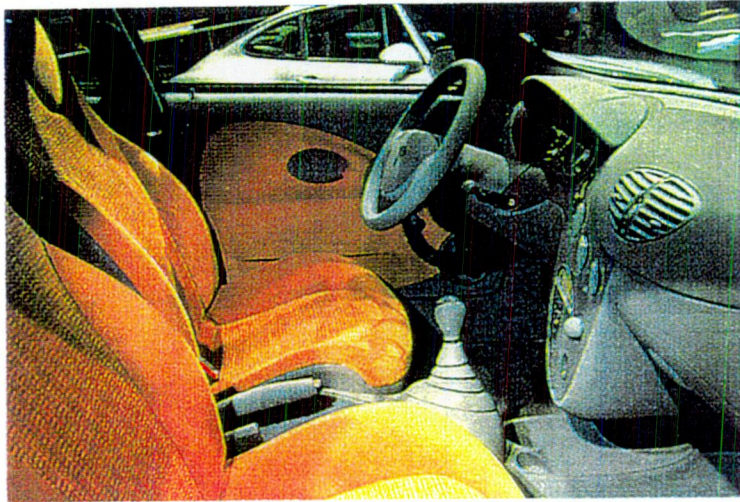


Fig. 4.7: Interior of Porsche C88.

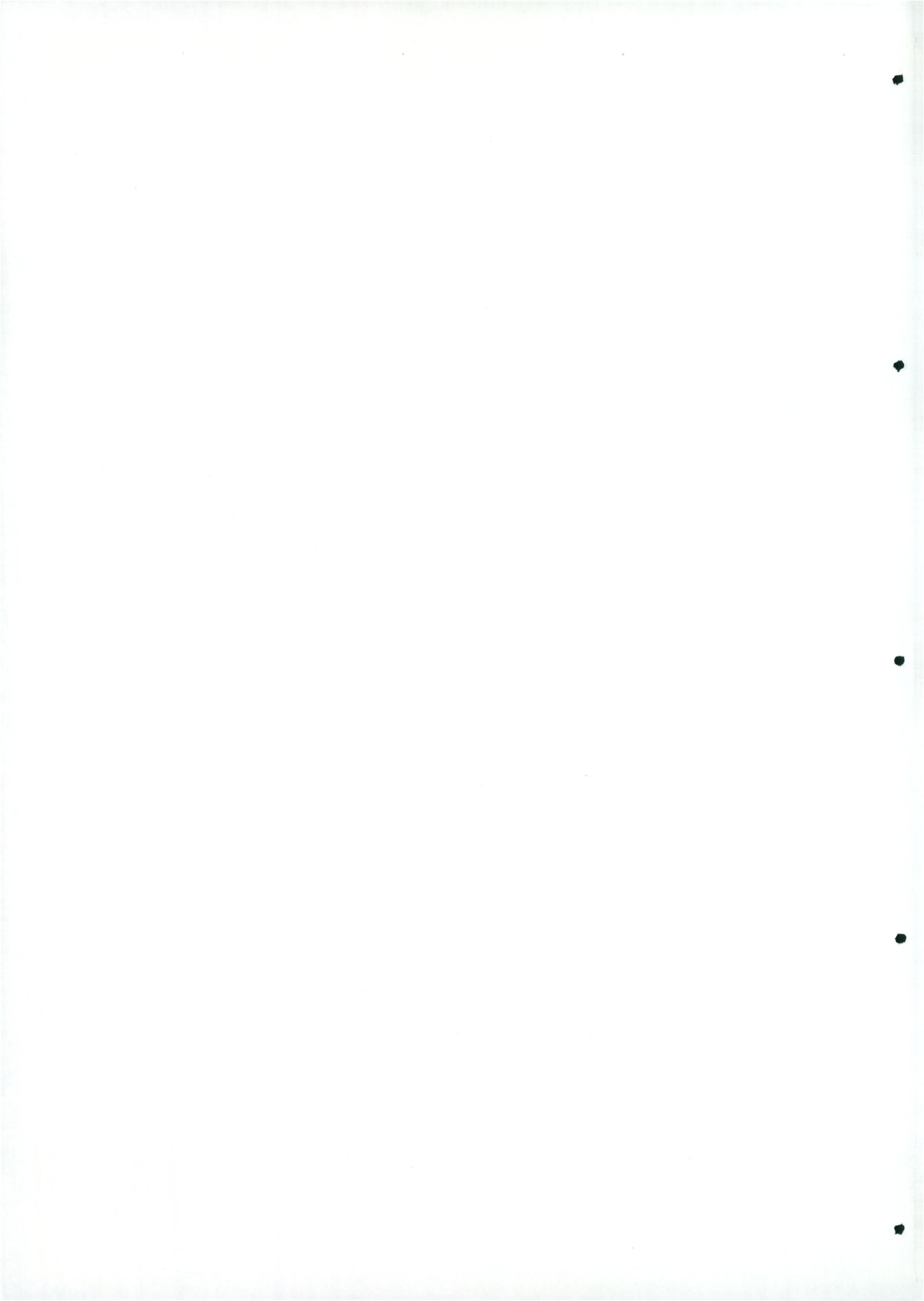


Fig. 4.7 shows the interior of this car and we see that the controls are the same as in standard cars. There is a steering wheel, three pedals and a gearstick. This is the same layout as the 1903 Mercedes and the modern BMW that it was compared to in chapter 2. To become a master at controlling this layout and mastering the art of driving takes some time, as this author can testify.

Why couldn't the car manufacturers use this opportunity to address even this factor? Automatic transmission technology has been available since the 1930s (see Scarlett, 1995:282). Fig. 4.8 shows a Mercedes project making use of 'drive by wire' joystick controls, whereby all the pedals and the steering wheel are amalgamated into one and the gear stick is disregarded. It is all controlled electronically. This not only makes the car safer in the event of a frontal crash, since the existing components are known to cause much injury (see *Crash 1998*), but it should also make the car cheaper since less components are used.

The implications of introducing such a system in the 'developed world' would be apparent since the controls differ so much from those that people are accustomed to using. However, in China, many of the car buyers will be first time owners so there would be nothing new to get used to. As mentioned previously, Nissan suggested that potentially this could be the world's biggest market in 20 years. Therefore this 'local' market could lead the way for the global market.

It could be said that implementing this novel approach could make China a 'guinea pig' for the rest of the world. But, by introducing a facility like this to help 'motorise

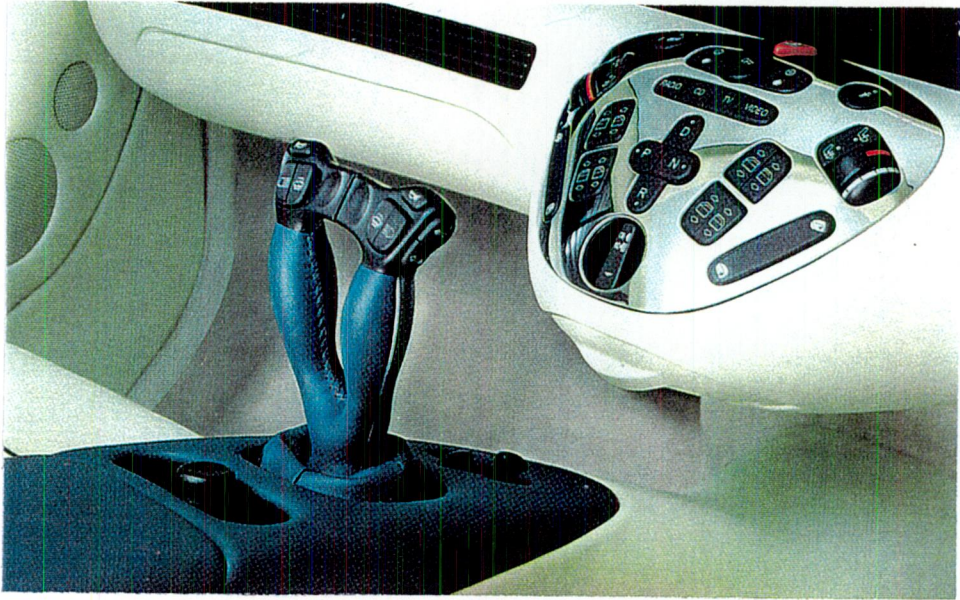
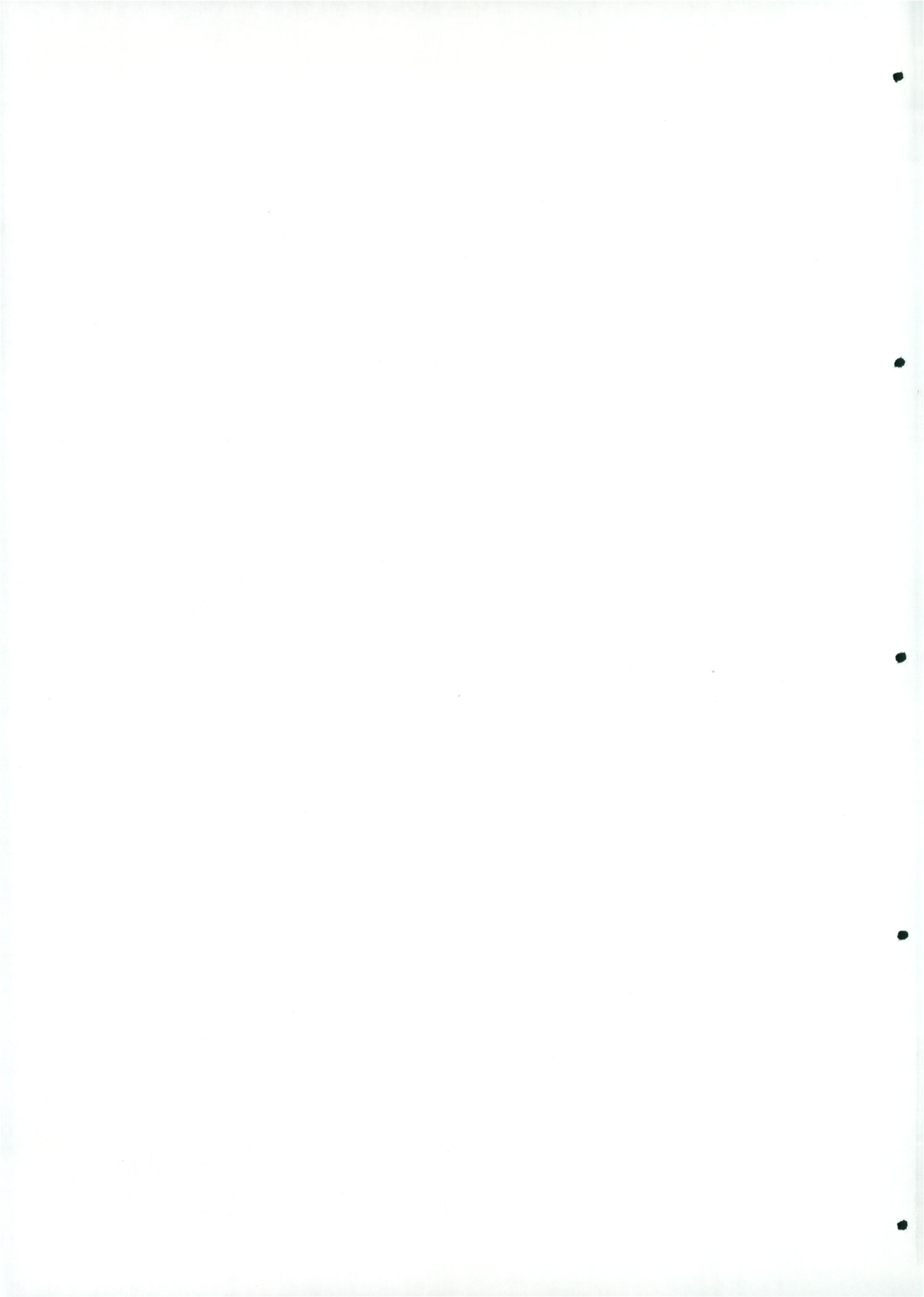


Fig. 4.8: Mercedes joystick concept.



a nation of non-motorists', when its benefits would be seen, this facility could be adopted in other parts of the world. This would be an 'ear to the ground' approach on the part of the manufacturers. They would 'think local' and then, if the idea was suitable, 'act global'.

Taking into account the previous chapter, the attitude of the representatives from the car companies regarding this project was predictable. Jurgen Hubbert of Mercedes said the following: "In the beginning, no-one will earn big money in China. But that will change. The costs of building in Europe go from bad to worse" (Kacher 1995:17). Wayne Booker of Ford made the following predictions for the Chinese market: "Small and medium cars will be popular. But it's only a matter of time before the Chinese discover real comfort and big performance" (Kacher 1995:19).

These quotes, together with the example of the Porsche C88 concept, again depict the power brokers of the car world as having their visions firmly set in the past. What is needed within the car industry is some fresh vision. Together with the previous chapters, this chapter has shown that there is little by the way of fresh thinking amongst the car manufacturers as they continue to reclothe a stale product and present it to their customers. What this chapter outlines is that even when there is an opportunity to introduce change, no matter how small, such as dispensing with the gear changing procedure, little initiative, if any, is shown. The next chapter will explore the sort of innovative focus car manufacturers could adopt.

Chapter 5

A POSSIBLE SOLUTION

So far in this discussion, the highlighted inadequacies of the motor car have been attributed, at least in part, to an apparent reluctance of car manufacturers to overhaul their product designs. However, while criticism has its place, what about solutions? The case of the 'drive by wire' joystick controls mentioned in the previous chapter would be a relatively simple implementation compared to some of the more complex deficiencies of car design highlighted in chapter 2. John Gilmore is an environmental engineering lecturer at Dundalk Regional Technical College, Co. Louth, Ireland. Here, he takes a holistic view of the motor car as part of an overall transport system and offers the following pointers on how our traffic problems might be addressed.

Firstly he outlines how inefficient the car is with regard to its space usage and power.

Motorways 50m wide are built to carry people who measure less than 50 centimetres across and most of the goods they consume are less than 50 millimetres wide . . . a 250cc go-kart can sprint from 0-60 mph in three seconds while a [3487cc] Porsche 911 takes 50% longer. The kart weighs less than 100 kilos, the Porsche almost 1.5 tonnes (Gilmore 1997:20).

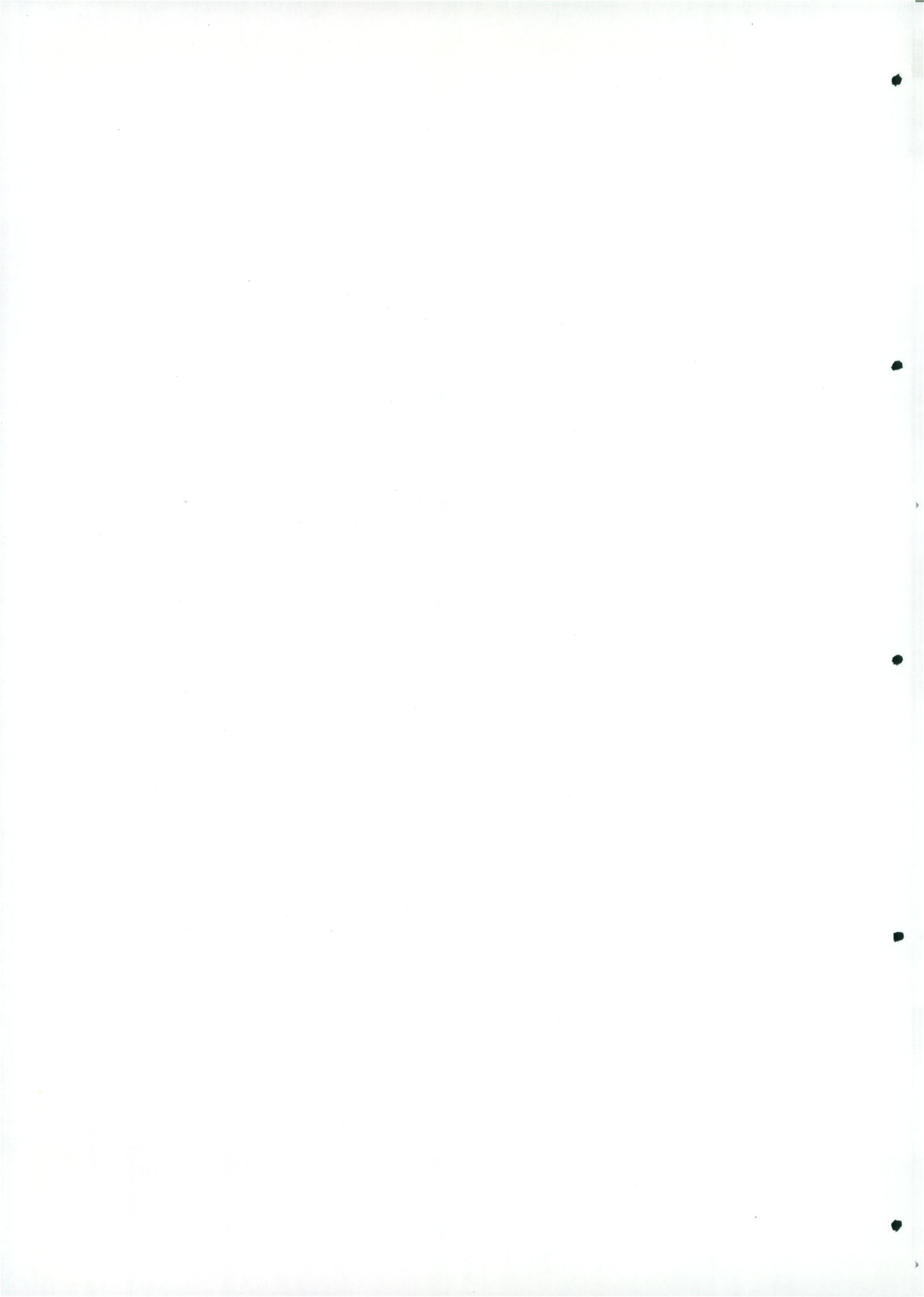
The space consideration is highlighted very well in fig. 5.1 as it shows how space efficient a bicycle is compared to a car.

Gilmore suggests that what is needed is a guided freight system. He argues that the human body's blood circulation system is an interesting example of such a system:





Fig. 5.1: Demonstrators highlighting the car's inefficacy.



billions of blood cells carry their cargo of oxygen and protein to every extremity in a one-way system that never stops. There are no traffic lights, unless you count clots, and the 'vehicles' are all of the same size - no ego-trippers or juggernauts making arterial roads dangerous for bicycles. Can we mimic this ideal flow, where collisions happen but are harmless? (Gilmore 1997:21).

The following outlines his suggestions for a systematic approach to transport.

Gilmore argues that . . .

Millions are spent in transport laboratories to see what happens 'in the event of a crash' occurring, and tonnes of steel are put into crash barriers which are 'useful' only when someone crashes into them. We are nearing the point of putting black box technology into cars to measure the last few milliseconds of people's lives (Gilmore 1997:20).

As an alternative, Gilmore suggests putting cars on a guided system such as a track, rail or channel. Thus, the technology needed becomes simpler and more elegant. In addition, a guided system means that the thousands of parts currently used in cars for cornering, damping and steering are no longer necessary.

Safety is another consideration of Gilmore's system as, once roads and vehicles fit each other, the human element which often causes accidents is eliminated. He observes that . . .

Anyone who's experienced the exhilaration of a roller-coaster will have experienced a transportation system that offers almost complete safety, yet using ultra-light cars, without street lights, brake- and indicator lights, wing and rear-view mirrors, crumple zones, side impact bars, air bags, seat belts, cats eyes, rumble strips, road markings, warning signs, breathalysers or 'crash test dummies'. Alternatively, we could take the existing approach to its ludicrous conclusions and all drive Sherman tanks (Gilmore 1997:20).

The Sherman tank hypothesis might not be too far away since in North America the best selling vehicle at the moment is the Ford Y series pickup truck (fig. 5.2). In

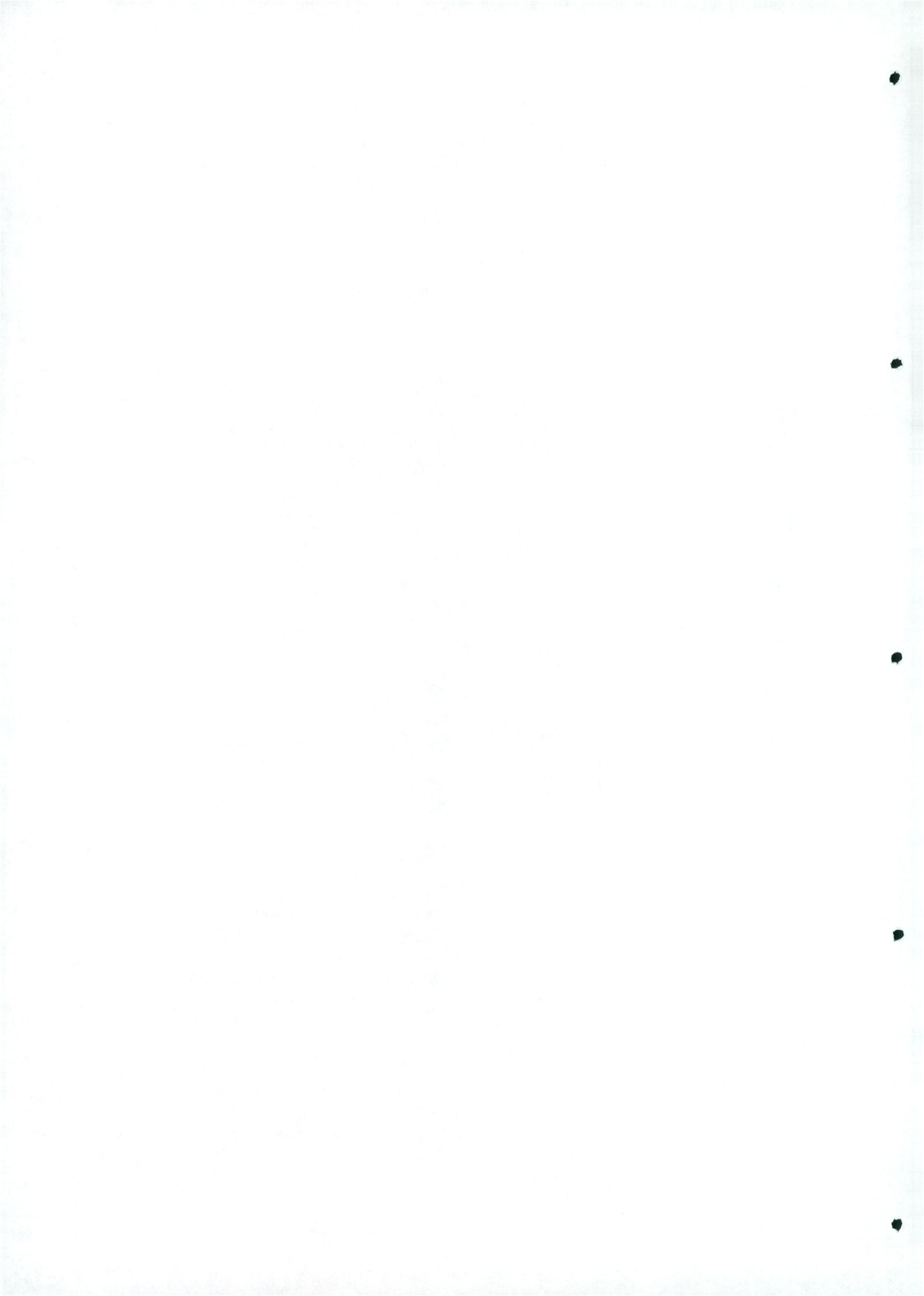
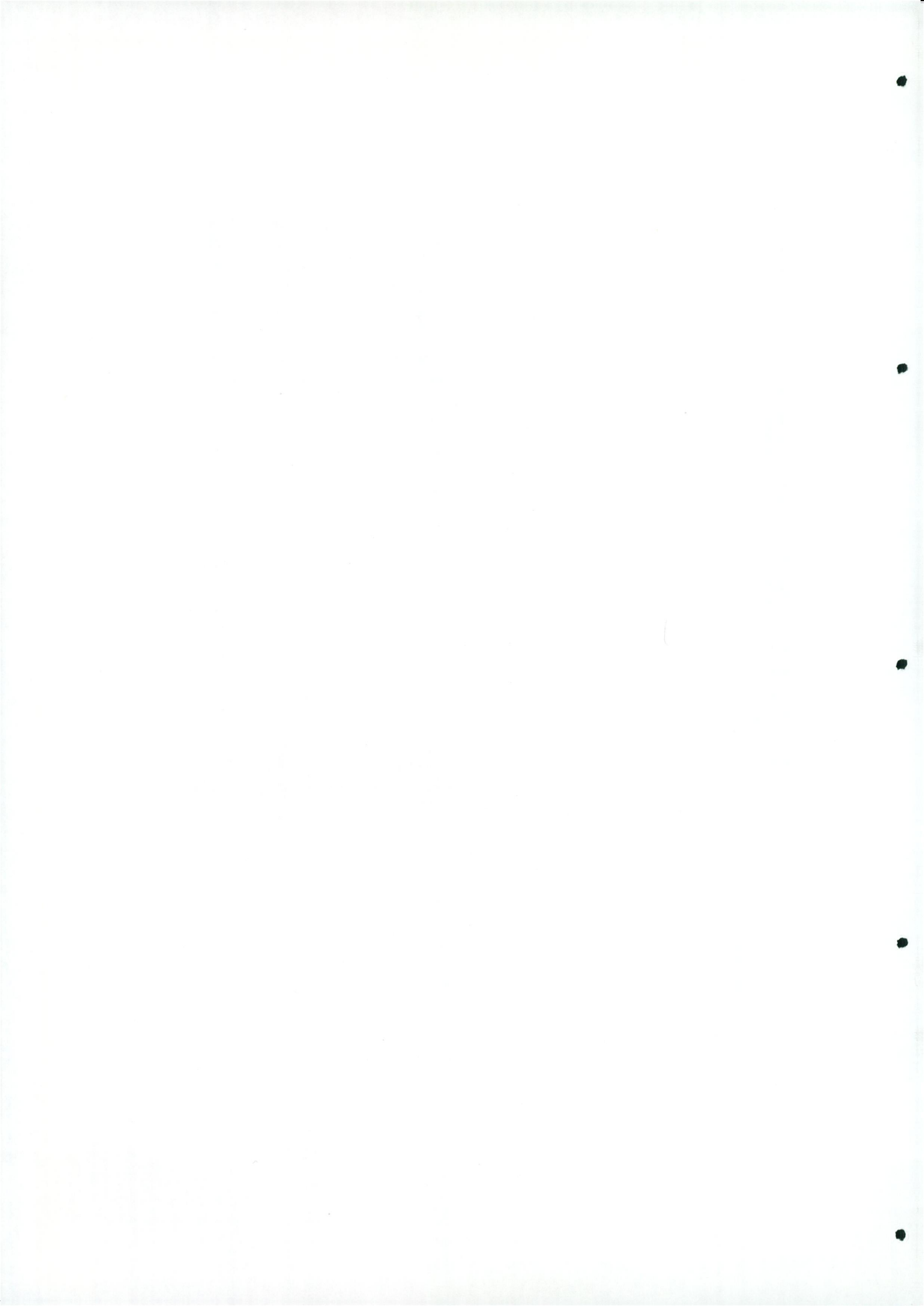




Fig. 5.2: Ford Y series pick-up truck.



1995, there were 691,452 sold and only 40% were bought for use as work vehicles with the remaining 60% being used as private cars (Kacher 1996:127).

In conclusion, Gilmore gives a basic outline of an idealistic vehicle for Ireland which he endearingly refers to as the 'Paddy Wagon':

To rise to the transportation challenge we need only design a little Paddy Wagon, with two seats (one each front and back), driver-controlled at speeds below 15 mph, and guided on tracks (like trams) at speeds above that limit (Gilmore 1997:21).

So, what Gilmore is suggesting here is that in order for transport to be effective it must work more efficiently and it must operate within a systematic framework.

Perhaps he is suggesting that we tackle the transport problems in a similar fashion to the way that Henry Ford tackled the problems with the car's production. Ford rethought the problems and made the production as efficient as possible. The next chapter examines how he went about this.

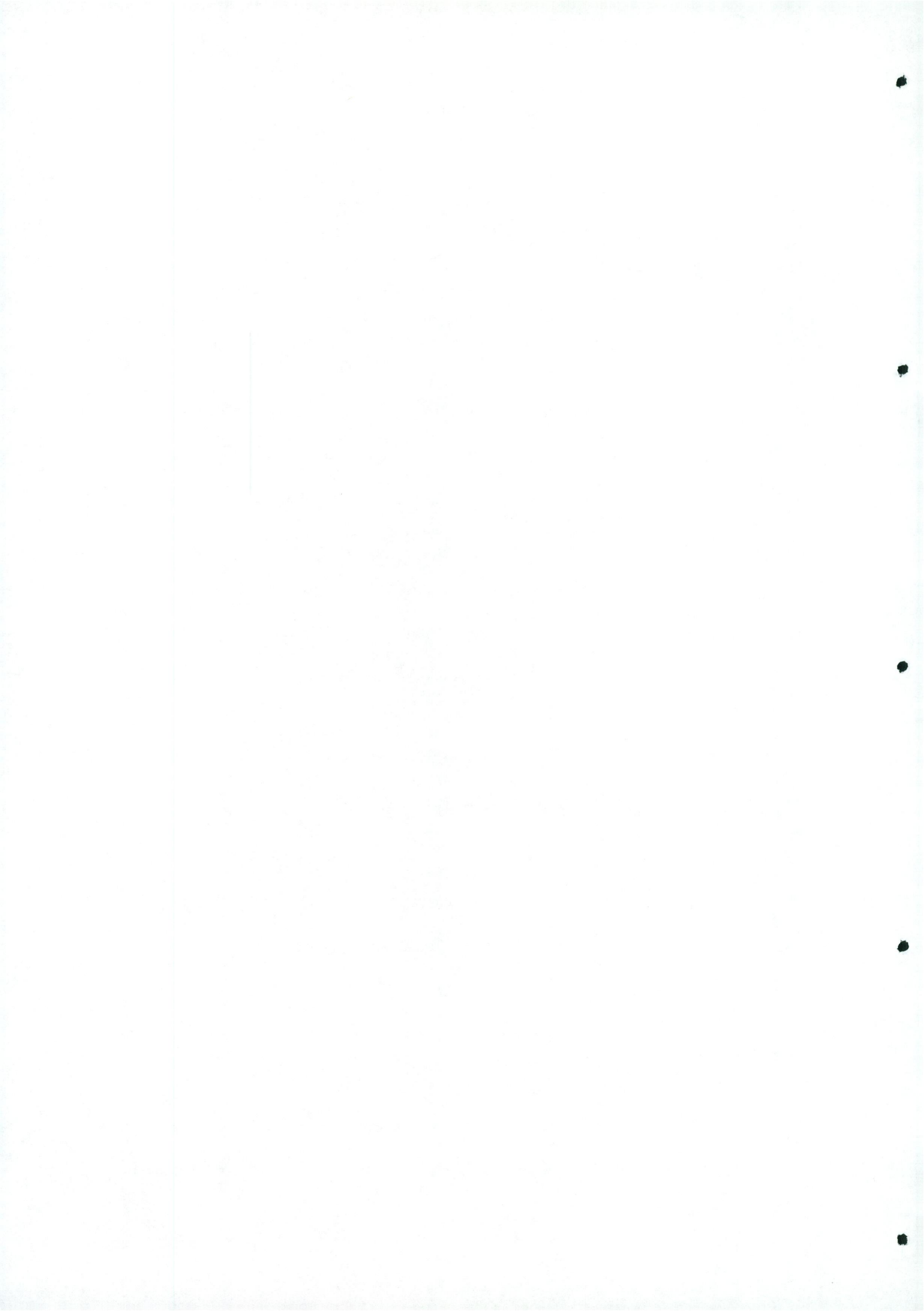
Chapter 6

IMPLEMENTING CHANGE

‘History is more or less bunk. It’s tradition. We don’t want tradition. We want to live in the present, and the only history that is worth a tinker’s damn is the history we make today’. (quoted in Batchelor 1994:238)

These are the famous words of Henry Ford (fig. 6.1), the man who changed the course of the car’s future in 1908 by rethinking the manufacture of the machine. We have come to the conclusion, through the examination of the car in the 1990s, that it has evolved little since its pioneering ancestors at the turn of the century. The *Model T* brought about a social revolution in America by mobilising the masses. It was the product of a vision Henry Ford had whereby he could liberate rural America from the harsh life that was the lot of most people in the US when the car was launched in 1908.

Its success was as a result of good design and planning, feats both undertaken and led by Ford himself. Henry had little formal education and his utterance above of ‘history is bunk!’ was thought of by many of his generation as typical of the man’s ignorance. It was probably this ‘ignorance’ that allowed him design the *Model T* by his observance and interaction with his ‘ignorant’ customers in his varied work roles before successfully starting, on the third attempt, the Ford motor company that still exists today. He was in his mid forties at this stage and previous jobs included mending neighbour’s clocks as a teenager, then serving as an apprentice at the Flower brother’s machine shop. He worked for the Edison illuminating company and when



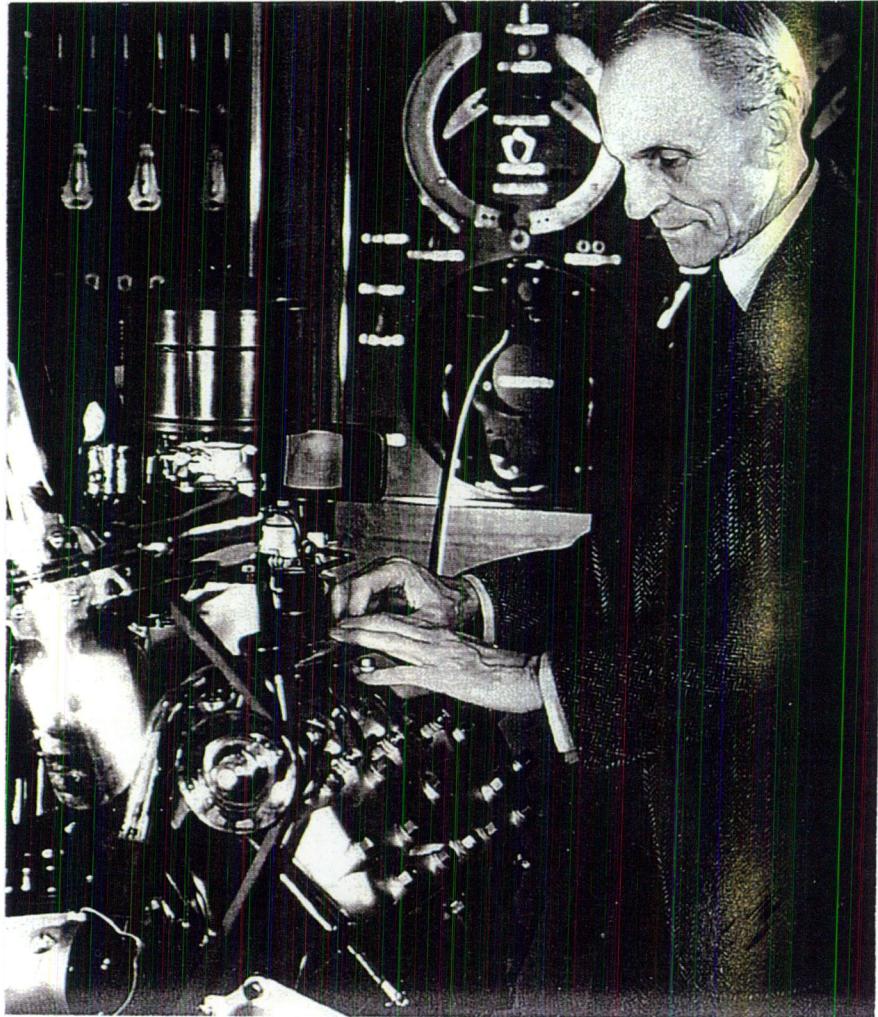
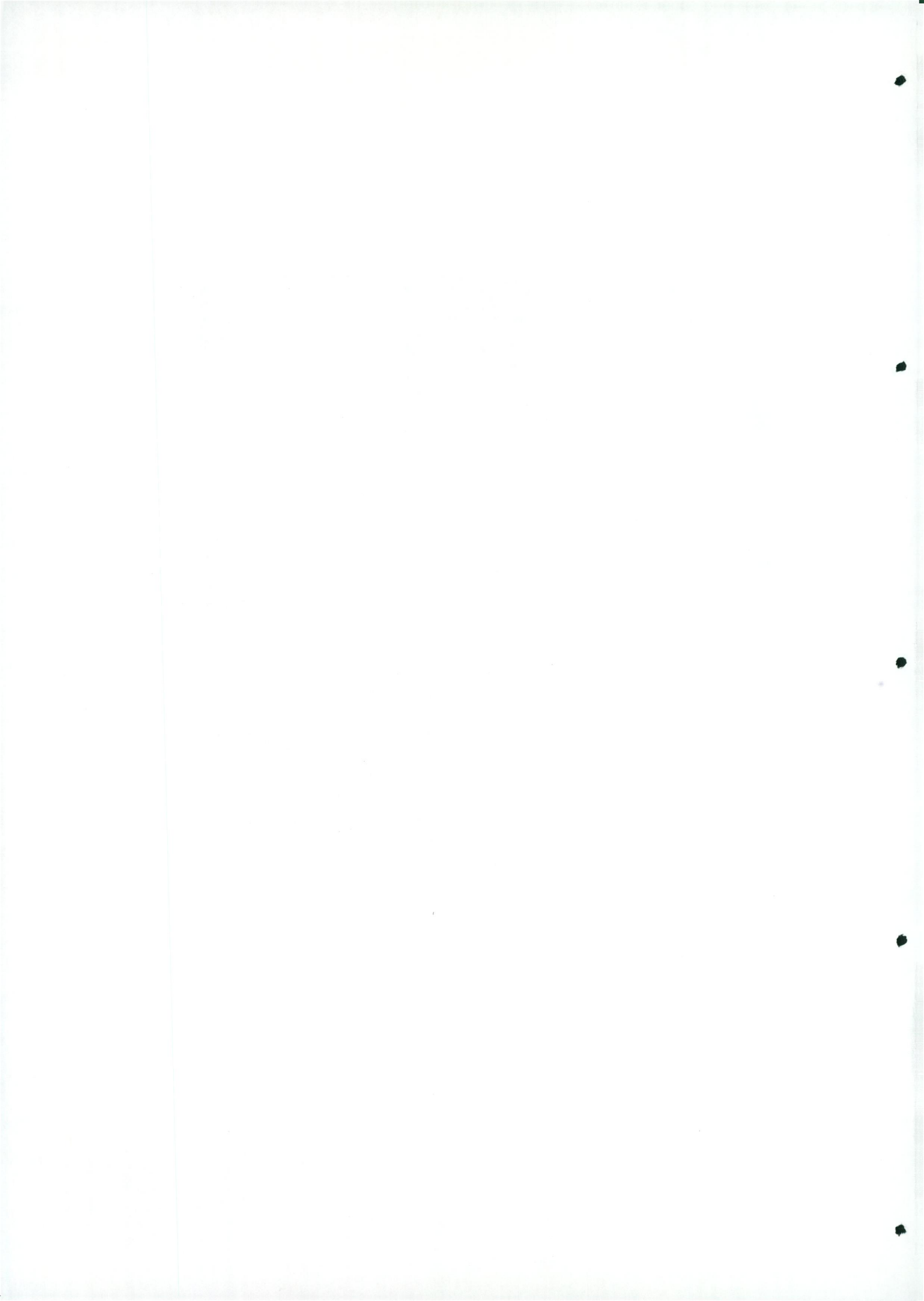


Fig. 6.1: Henry Ford.



he first married, he and his wife Clara ran a small farm together, selling the produce and Henry did odd-jobs for other local farmers, using steam powered machines.

This lifestyle would appear to be at odds with a man who grew up in comfortable surroundings on a 700 acre farm. One could even go as far as depicting the man as an idiosyncratic drop out. However, this was Ford researching his market, if subconsciously doing so at the time. A notable feature of his was his ability to engage and enthuse with others: "Saturday nights we had quite a crowd. Henry had some sort of magnet. He could draw people to him: that was a funny thing about him" (quoted in Batchelor 1994:18).

From the above narrative it could be deduced that the Model T was the product of almost 30 years of observance and training. It was a product that recognised a market and developed it rather than taking the other option of competing or perhaps 'hanging on' in an existing limited market. Henry rethought the concept of the car so as to make it more affordable for the lower classes, instead of chasing the quick profit given by offering a plaything for the rich. This stood to him as, at one stage, he was reputed to have been the world's richest man.

Now however, Uncle Henry is probably turning in his grave. He was an innovator and did wonderful things for the progress of contemporary society in his day. Much of his vision was the result of idealistic notions and moral beliefs that he formulated during his long and varied career before he set up the multinational as we now know it. The very fact that he was an innovator is the reason for his perpetual sub-terranean



turbulence. As indicated previously, the 1993 Ford Mondeo, appears to be nothing but an evolutionary perfection of the Model T philosophy. The same comparisons could be made between this pair as was made between the 1903 Mercedes and the BMW in chapter 2. As shown, the problem with this consistent perfection has brought with it a narrow mindedness that has given to us a product that is unsuitable for this age.

Charles Handy (1994:49) commenting on the need for organisations to adapt to their changing external environmental context offers the following advice: "It is one of the paradoxes of success that the things and the ways that got you to where you are, are seldom the things to keep you there". Henry Ford changed direction and this led to a future for his customers who might otherwise have never owned a car. Since then we seem to have kept going the same way. Today, even though the above is evidence that the future is elusive, perhaps it is time for a new change of direction for the motor car. John Gilmore's ideas provide food for thought in fashioning a new future.

Ford spent much of his life (until his mid-forties) looking for a direction and it was time well spent. It is true that present day car manufacturers observe and interact with their customers, but they only see what they want to see, being constrained by the profit motive. As E. B. White said: "Not even a collapsing world looks dark to a man who is about to make his fortune" (quoted in Tripp, 1976:733).

For the future, somebody has to take a risk and address the 'real problems' with car design, some of which have been discussed in the course of this thesis. It is time for a



new 'Henry Ford' type figure to emerge and quite literally revolutionise the way cars are made.

Henry Ford's achievement was in revolutionising the way the car was manufactured, by making the manufacturing process more efficient and systematic. While John Gilmore's approach to apply efficiency and a systems theory to transport, as outlined in the previous chapter, has some merit, it disregards one main factor. It would appear that one of the main objectives of the individual motorist is the instinct to retain as much control as possible and this is highlighted by the 'Sherman tank' analogy he uses. This psychological need for control is also highlighted in the recent phenomena of 'road-rage' (see Ferguson 1997). So although Gilmore's theories may be efficient, the human needs factor has to be addressed. Chapter 1 also highlighted Alfred P. Sloan as a great man within the historical context of the car's evolution. He made the car enticing to buy and it is the selling aspect of a prospective transport system that is discussed in the following chapter.



Chapter 7

ENSURING SUCCESS

The reason that the Italians are such good designers is that they understand irrationality so well (Clarkson, 1995).

It has been suggested that car design is unenlightened and that the driving force behind this is embedded in capitalism. The ensuing trend towards inflexibility has been highlighted, using the example of China. A framework on which to base a revolutionary transport system has been outlined and it has been shown how it might be implemented successfully by examining how Henry Ford implemented his revolutionary manufacturing system.

However, as mentioned in chapter 1, one of Ford's failings, as the Model T neared the end of its life cycle in the late 1920s, was when main rival, General Motors eroded Ford's sales with the GM Art and Colour department headed by the famous Harley Earl.

Awareness at Ford that 'the motor car business is a fusion of 3 arts - the art of buying materials, the art of production, and the art of selling' existed before the Model T was even put into production. Yet in practice, Ford had focused on the first two, while the third relied - too much, perhaps - on the spectacular news stories generated around the car, its ever quote-worthy creator and his belief that lower prices would always equate with increasing sales. At General Motors, an alternative and more durable strategy was evolving (Batchelor 1994:57).

The *Model T* was a product of a vision Henry Ford had whereby he could liberate rural America from the harsh life that was the lot of most rural people in the US at

the turn of the century. The benefits of his product were immediately recognisable to his customers in that it offered a vastly improved lifestyle.

The main consideration with a revolutionary transport system (or a revolutionary product in general), such as that proposed by Gilmore, is to recognise that people will not switch over to a new system from the one they were used to unless there is a strong motive for so doing. At the moment there is evidence to suggest that the ozone layer is depleting and the polar ice-caps are melting. However, in this fast moving society in which we live, things that happen over time are difficult to recognise. People rely on what they are told about these issues which are regularly highlighted in the 'media' in the form of news coverage from the likes of the Kyoto summit in Japan and the Rio de Janeiro summit which preceded it.

From the Batchelor quotation above, we see that Ford himself recognised the power of the media back in the 1920s but it is now becoming increasingly difficult for people to recognise the difference between fiction and non-fiction in the 'media'. People in the 1990s would appear to have become immune to sensationalism which mixes up irrelevant stories with the relevant in order to maintain a 'hype' that keeps the media interesting. The 'hype' Ford tried to maintain surrounding the Model T could only last so long.

The following is a good description of the modern media. It is an extract from a reply to a question about scepticism of the media, when Lewis Lapham (editor of *Harper's* magazine) was addressing Public Radio News Directors in Minneapolis in August 1995.



The formula works like this: The evening news - you start with some bodies being brought out in a body bag - and this is the New York local news. You know, five people have been killed in Harlem, there's a train wreck, there's a fire, there's war in Bosnia, there's the O.J. Simpson trial and that's the first five minutes, and then we go to the commercial . . . and the commercial is "American Airlines is going to take you to paradise" or you're going to ride to heaven on the American Express card . . . (Finlay 1998:22).

Currently, car manufacturers are successfully avoiding their responsibilities. Using the environment as a case and point, they are exploiting this climate of mixed up messages in the media to their own advantage. For example, there is a massive increase lately to promote bicycles as accessories to cars. Car manufacturers are sponsoring mountain bike teams such as the BMW / Proflex professional mountain bike team (fig. 7.1) or the Volvo / Cannondale team. In order to further their own interests, car manufacturers have hijacked the exhortation of the environmental lobby to take up cycling. Thus . . .

A bike is no longer a bike, it is a fatuous political statement" ... [Now that bicycles] "are a *lifestyle accessories* they are more likely to be strapped to a recreational vehicle, driven 100 miles into the country and then ridden five miles down a leafy lane in the name of ecological awareness (May 1997:53).

Many other situations such as that outlined above, whereby messages are successfully misconstrued so as to pretend problems do not exist, are realities which are difficult to change, as Lapham's quotation outlines. This is the way the world works at the moment. If it is to be implemented, change in transport will have to be brought about in a practical manner whereby the existing real concerns are addressed. The existing 'system' will have to be worked in the interests of beneficial change. At the moment the existing system is being exploited in the interests of the car manufacturers.

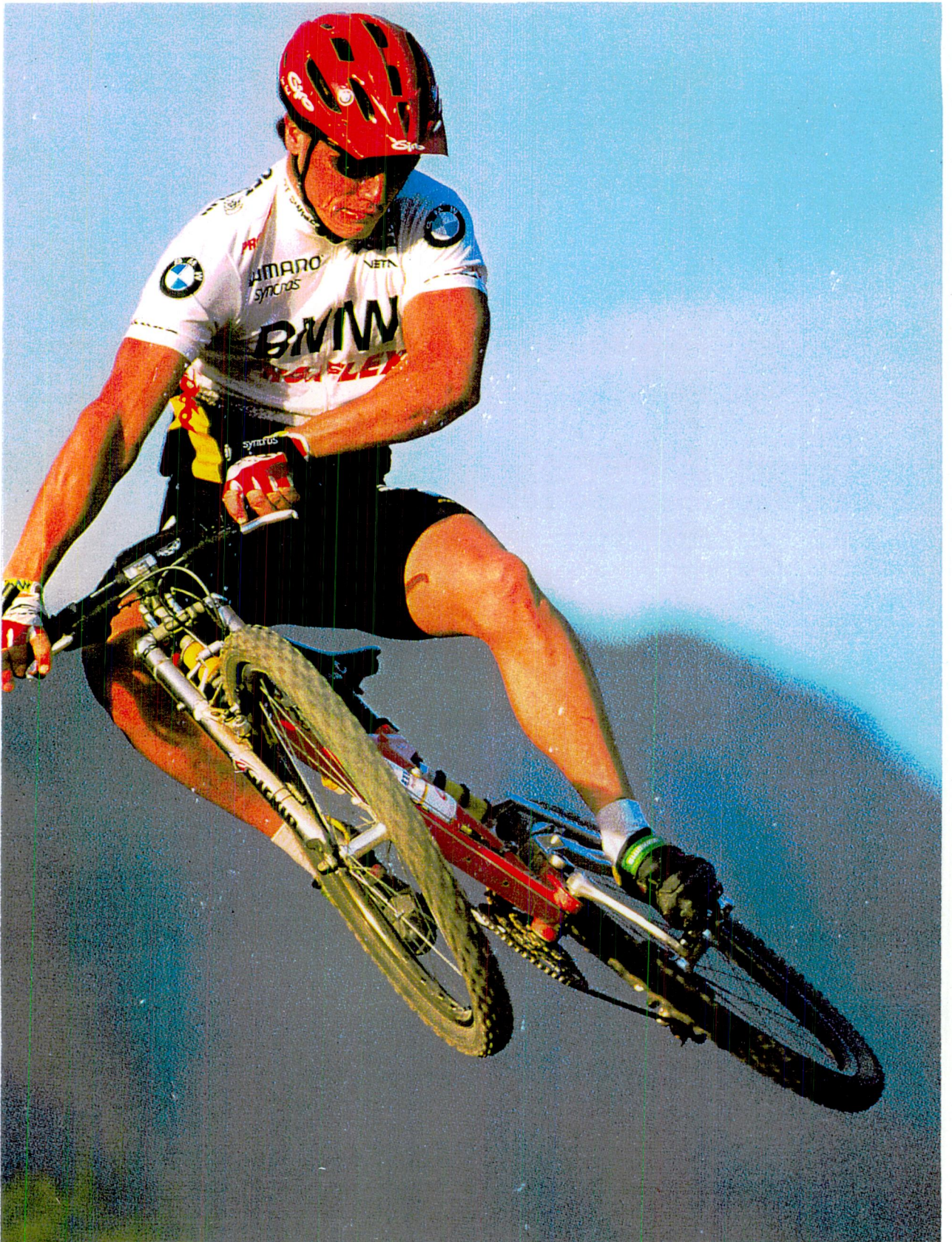
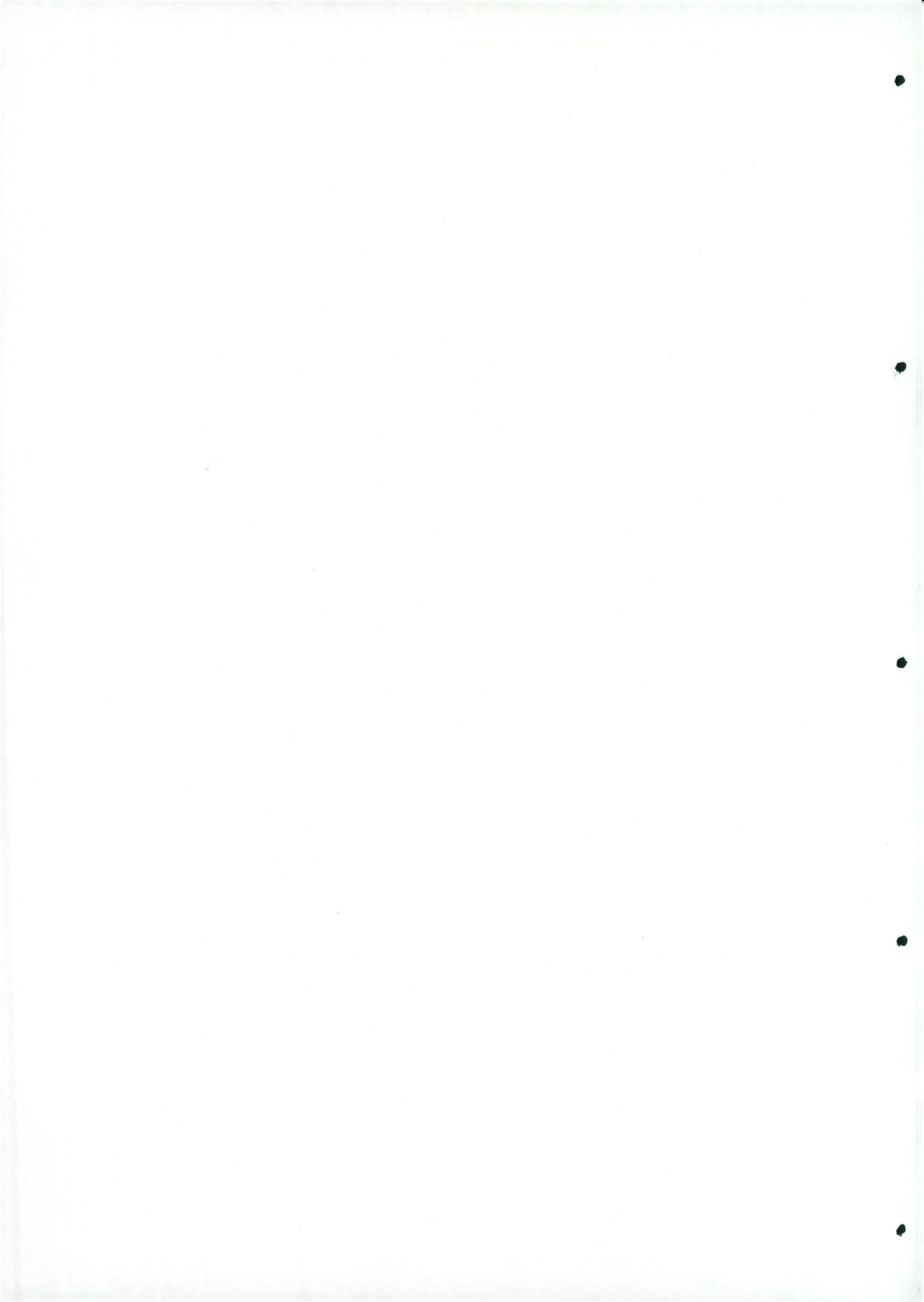


Fig. 7.1: A member of the BMW / Proflex professional mountain bike team.



This acceptance of the contemporary, while bringing about change, was recognised by pioneering industrial designers such as Raymond Lowey who designed in accordance with the MAYA (most advanced yet acceptable) principle. Richard Dreyfuss included an element in his design called 'survival form': "By embodying a familiar pattern in an otherwise wholly new and radical form, we can make the unusual acceptable to many people who would otherwise reject it" (Heskett 1993:178).

Environmental problems do not appear to be immediate concerns to the majority of car buying consumers. Consumers know that there is a problem somewhere within all the media messages they receive, but they are unable to relate to these messages. Car manufacturers have rearranged people's perception of the environmental situation in their own interests by working this media situation, as the mountain bike example highlights.

However, other things could be highlighted as immediate concerns to people and a style developed in accordance with that situation. As an example, rock band, U2 recently highlighted the saturation of commercialism to much of the world, with its POP Mart tour (fig. 7.2). They conveyed their message through the use of crude, explicit stage props and imagery projected onto a 120 foot high giant screen highlighting songs such as 'Last Night On Earth' with a chorus as follows:

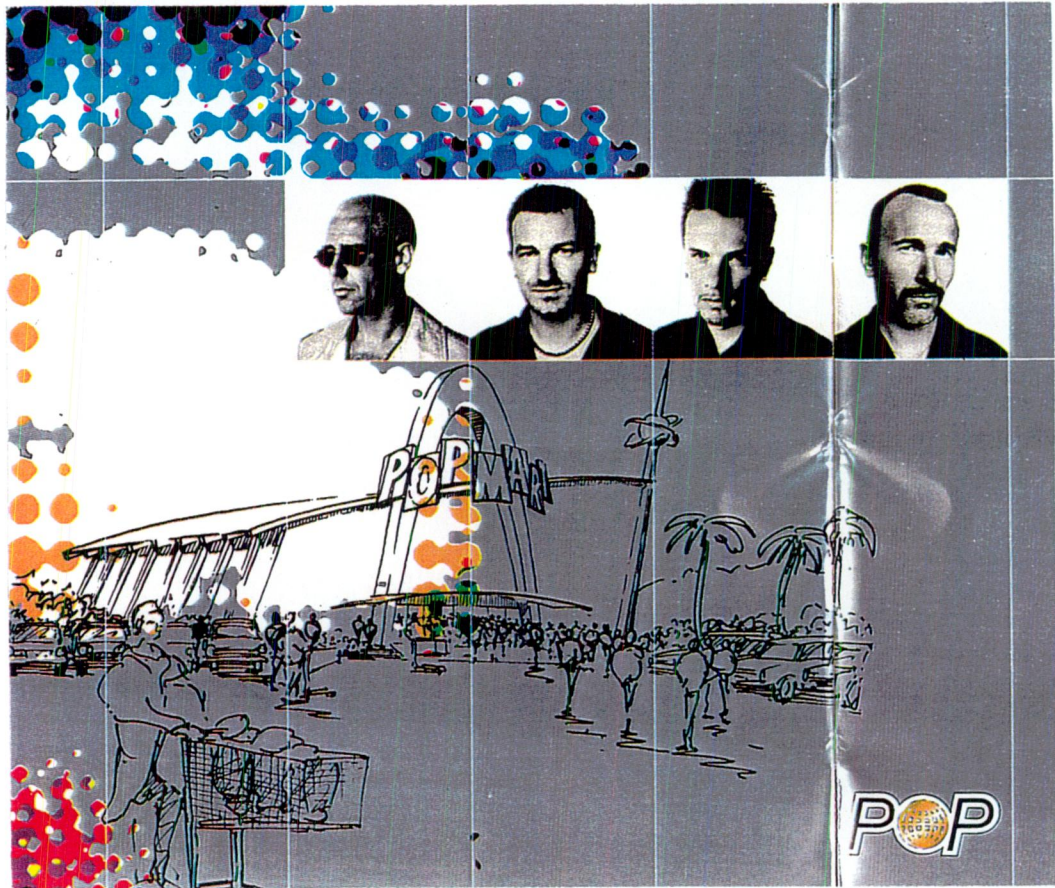
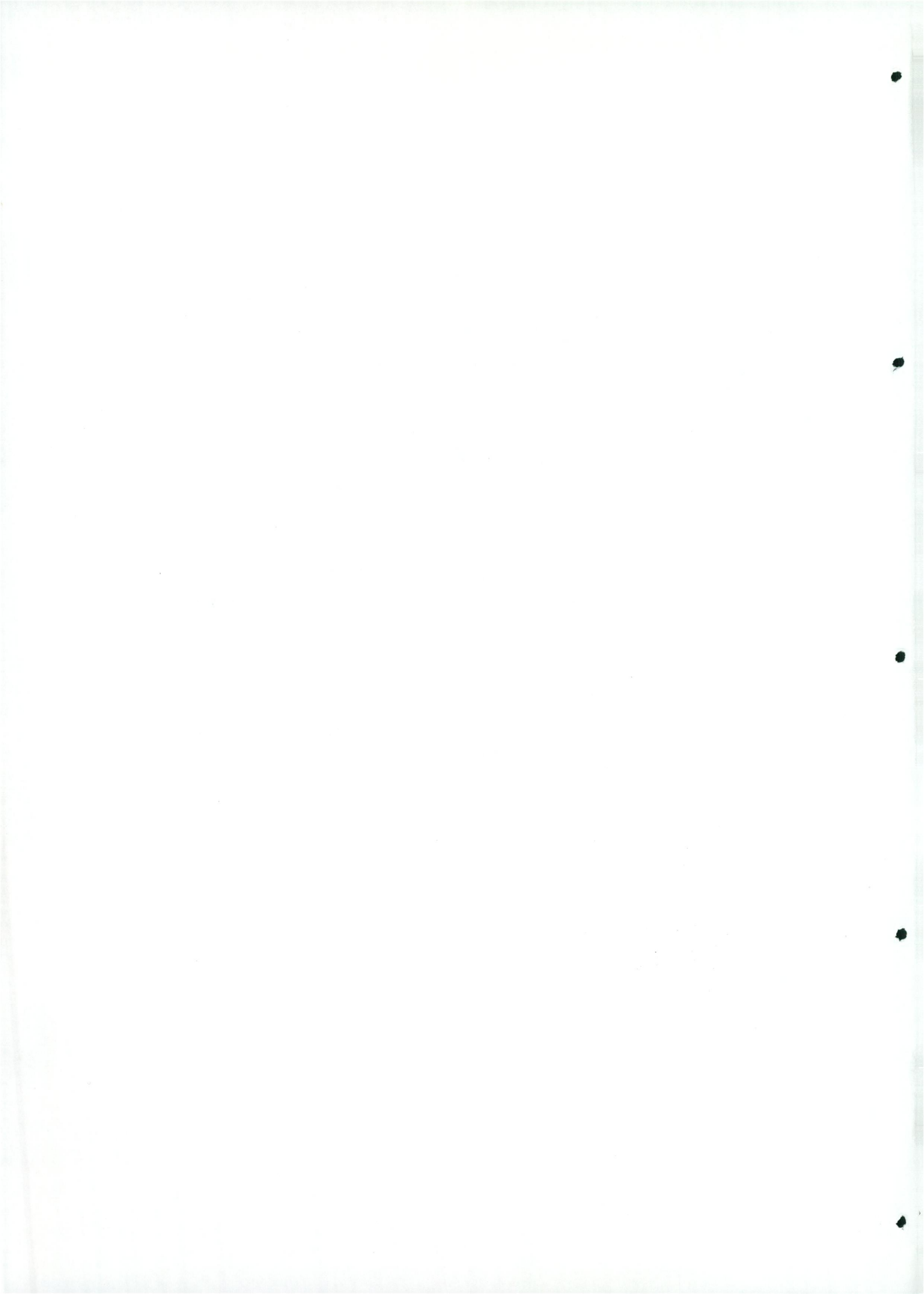


Fig 7.2: Page from the 'Pop' album sleeve showing U2.



“YOU GOT TO GIVE IT AWAY
YOU GOT TO GIVE IT AWAY
YOU GOT TO GIVE IT AWAY
YOU GOT TO GIVE IT AWAY
she DOESN'T CARE WHAT IT'S worth
SHE'S LIVING LIKE IT'S THE LAST NIGHT ON EARTH”
(U2 1997)

With such a powerful force (U2) conveying such a message, people could be educated as to the inadequacies of gross commercialism in its present state and this, in turn, could be a cogent reason for adopting a new transport system that makes sense, rather than continuing on with the car as it is today. A new 'style' could be developed along these lines in order to entice people to buy the new / improved transport system.

As outlined in chapter 1, Henry Ford had a functionally adequate product but Alfred P. Sloan's employment of Harley Earl to apply form to this product made it a more enticing product. In the 1990s, the functionality of this product has failed to evolve appropriately over the intervening years and hence we are faced with the many problems we have.

The car has consistently relied on styling for its evolution but now it is time for real structural change. This styling is a communication with the customer. Most of the problems associated with the car are boring within the context of the sensationalism of the modern media. 'Global emissions' do not affect the emotions as strongly as somebody being hacked to death since the former is technical and academic and not as graphic as the latter. So, a new transport system must communicate a message within its style in order that it sells itself. If the importance of styling is forgotten

when bringing about this change, the reasons behind the change will not be appreciated, as the style communicates the message.

CONCLUSION

This thesis began by establishing the importance of style in the car of the 1990s. It has examined the development of the car over time, concluding that the car of the 1990s still bears a strong resemblance to some of the earliest models which emerged at around the turn of the century. This suggests that there is now a strong argument for change in car design. It is suggested that a major emerging market for cars, such as China, where people have little by the way of pre-conceived notions of what a car should be, presents a good opportunity to toy with new ideas in car manufacture, However, there is no convincing evidence to suggest that this opportunity is being taken on board, rather, existing designs are merely being adapted to 'fit' the needs of this new market.

Again, building on the need for change, the thesis also described one radical solution to replace the existing concept of the car. However, it is recognising that radical change is very difficult to bring about. Yet, the success of Henry Ford in achieving a quantum change in the car manufacturing process established that change is possible. The outcome of Ford's success - a profitable company and many satisfied customers - must also be borne in mind. Profitability is of prime importance to any business organisations. Given this reality, car manufacturers can only afford to travel the route of radical change if customers are receptive to their new ideas. Otherwise the business will decline and shareholders who fund the operation will transfer their investments elsewhere.

The importance of style in the world of cars was highlighted at the outset of this work. Therefore, it has to be part of the equation in any change process. Just as car manufacturers rely on the media (e.g. television programmes, dedicated car journals, newspaper articles) to convey information about adaptations to current models, perhaps the media can also prepare the ground for more radical departures in car design, by highlighting customers awareness of the shortcomings in current car fashions.

The attendant problems of the car as it is currently constituted, with CO₂ emissions, traffic congestion and unacceptably high accident rates, were highlighted at the outset of this thesis. These suggest that a 'route to change' is necessary. If they face up to this challenge, car manufacturers can carve out a successful long-term future. on the other hand, if they fail to respond to the environmental demands, the road ahead, past the immediate comfortable bend, is set to be fraught with difficulties.

BIBLIOGRAPHY

Bahnsen, U., "The Courage Of Intuition", Stileindustria, Vol. 3, No. 9, March 1997, pp. 12-15.

Ballantine, R. & R. Grant, The Ultamite Bicycle Book, London: Dorling Kindersley, 1992.

Batchelor, R., Henry Ford Mass production, Modernism and Design, Manchester: Manchester University Press, 1994.

Bayley, S., Taste; The Secret Meaning of Things, London: Faber and Faber, 1991.

Bayley, S., "Brand Rover", Car, Issue 424, December 1997, p. 108.

Clarkson, J., Top Gear, BBC 2, November 9, 8.30 pm, 1995.

Crash, Channel 4, January 20, 9.00 pm, 1998.

Cropley S. & K. Howard, "The Next Century" Autocar, Vol. 206 No. 5, 1 November 1995, pp. 346-354.

Ferguson, A., "Road Rage", Time, Vol. 151 No. 2, January 12, 1998, pp. 36-40.

Finlay, F., "Leaving the Truth Behind" The Sunday Tribune, 18th January 1998.

Gilmore, J., "Traffic Could be Thrilling", Technology Ireland, October 1997, pp. 19-21.

Green, G., "The New Guv'nor", Car, Issue 402, February 1996, pp. 136-139.

Green, G. et al., "Detroit Winners", Car, Issue 415, March 1997, pp. 46-52.



Griffiths, J., "How Toyota Filters its Component Suppliers", Financial Times, April 10, 1991.

Handy, C., The Empty Raincoat, London: Hutchison, 1994.

Heskett, J., Industrial Design, London: Thames and Hudson, 1980.

Horrell, "Why this will be the World's Best Selling Car", Car, Issue 407, July 1996, pp. 86-91.

Kacher, G., "China Woos the Motor Industry", Car, Issue 390, February 1995, pp. 17-20.

Kacher, G., "Portrait of a Best Seller", Car, Issue 405, May 1996, pp. 127-131.

May, J., "Frontlines", Car, 1997, Issue 424, December 1997, p. 51.

Oracle, "Major Car Makers Vie for 'Biggest Prize in Motoring'", Car, Issue 389, January 1995, pp. 20-21.

Papanek, V., The Green Imperative, Singapore: Thames and Hudson, 1995.

Porter, G., Senior Physics, Dublin: Folens (1987).

Scarlett, M., "The 10 Laws of Creation" Autocar, Vol. 206 No. 5, November 1995, pp. 274-282.

Tripp, R T., The International Thesaurus of Quotations, Middlesex: Penguin 1976.

U2, POP, CD, UK, Island Records, 1997.

Wilson, P C., Chrome Dreams; Automobile Styling Since 1893, Pennsylvania: Chilton Book Company, 1976.

