

The driver in the machine: changing interiors of the car

This article is based on a curious observation, namely that automobile historians have paid much more attention to the exterior of the car than to the interior. The technology of the car as a whole and the design of the body shell have been extensively researched,¹ whereas the passenger compartment has received little attention.² This seems inappropriate, since the interior is as highly designed as the exterior, but has some more significant features and functions. Explaining the development of the interior helps us to understand the attraction of motor vehicles as part of the road transport system. Moreover, a history of the interior helps to explain the history of the antisystemic image of cars which was important for the diffusion of individual road vehicles.

The automobile can be understood on the one hand as a part of the complex system of road transport, and on the other hand as an 'individual machine', which comprises several subsystems. The functions of the transport system and the images of their functions differ considerably, though. Driving a car in the traffic of today is to participate in a highly organised and regularised and therefore restricting system, whereas the ideas and desires of drivers mostly preserve an older image, derived from the European romantic movement, of 'lonely and free' driving. The interior of the car reflects clearly this discrepancy.

My approach tries to aim at functional development, not so much at the style and design of the interior. The dashboard and the 'cockpit', being part of the passenger's compartment, can be interpreted as a 'user surface' of a complex mobility machine. It is perhaps the most significant interface between man and a machine – certainly with a machine which is in the most widespread use and excites sentiments in a most extraordinary way. Unfortunately, the complete history of the interior and the 'sub-histories' of components and functional devices such as the gear sticks or the driver's seat have not been written yet. But I will attempt to outline briefly some significant changes in the interior of the car and in the relationship between driver, passenger and the 'speed machine'. I will concentrate my remarks on the German car culture, which in several respects is different from other European car cultures or from that in the United States. The German motoring culture caught on later and favoured different, generally smaller, types of cars.³ Motorcycles were more common until the 1930s. Many developments pioneered by American manufacturers

(e.g. powered windows) were adopted later, while some significant interior features were introduced in German models first.

It is obviously rather risky to span more than a century of development in a short text. This article should therefore be regarded as a summary of the issues to be explored in a future programme of scholarship. It could also be read as a sketch outlining the contents of an exhibition on the subject. Such a potential exhibition could offer a different view on automobiles. In most museums or exhibitions, these vehicles, representing the intersection in the relationship between the system of road transport and the user, are presented as integral objects like sculptures. Therefore the focus is on their exterior (and often on their technology). By concentrating on the interior of cars, a rather neglected but nevertheless significant element of car culture would come into view.

Two separate functions of the driver: working a machine and driving on the road

In the early car – up to about 1910 – the tasks of controlling a machine and of driving a vehicle were clearly separated (Figures 1–5).

*Figure 1 A typical 'workplace' of an early motor vehicle. Lubricators and pressure pumps to be actuated by the driver are prominent on the wooden dashboard. The equipment for producing acetylene for lighting purposes has to be watched. Levers for gear shifting and braking do not disguise their connection with the mechanical core of the driving machine. There is no windscreen. (Beaulieu)
Sedgwick, M, Early Cars (London: 1972)*

Figure 2 The workplace of a steam car, made by Schöche, c. 1900. Steering is not yet performed using a steering wheel. The reversing lever is prominent, as is the manual water feed pump. Another typical feature is that driver and passengers face each other, with the driver sitting in the rear. Frankenberg, R v and Matteucci, M, Geschichte des Automobils (Künzelsau: 1973), p45

Figure 3 Functional separation I: The driver's position has rudimentary protection from the weather, but it is mainly open. Passengers in this British Talbot car, c. 1910, are provided with a coach-like closed compartment. Sedgwick, M, Early Cars (London: 1972)

Touring and racing cars especially were strictly 'two-person affairs'. The mechanic had to watch the gauges in order to scan the state of the engine. He had to work the lubrication system, to control or even maintain the pressure in the petrol tank, and he had to have an eye on the temperature of the water cooling system. An early Austrian article refers to the driver being 'scared about the oilers which must be actuated, small holes having to be greased, carburettor levers having to be handled'.⁴ The necessary variation of the ignition timing, which had to be done by hand, was a task often shared between driver and co-driver. The co-driver's main task was maintenance and repairs. Even *Herrenfahrer*, gentlemen drivers, usually had a mechanic with them. When touring, his presence was often felt. Eugen Diesel, the son of the inventor, reported in his book⁵ *Autoreise 1905* the complete dependence of the touring party on the mechanical ability, as well as on the mood, of the paid mechanic with whom they had to share their journey.

The driver himself was considered to be overtaxed by performing both the functions of driving and of controlling the machine. Often he was neither qualified nor willing to act as his own mechanic. The early petrol car owners had to be wealthy persons who did not feel inclined to tinker with a complex, greasy and often dangerous mechanical device. The division of labour in the early motorcar is evident in the dashboard layout: the gauges were in the middle so they could be read by both persons (Figure 6).

In contrast, the rear part of the car interior was kept free of visible mechanics. This was space for the passengers who were supposed not to interfere with the mechanics or the driving at all. Here the 'creature comforts' such passengers would expect were fitted: upholstery was more opulent, fabrics prevailed instead of the more workmanlike leather, rugs were present and armrests were common. Since the bodywork of early cars was commissioned by coach makers, all the comfortable features which had been developed in the course of the nineteenth century were incorporated in the passenger compartments of motorcars too. To underestimate the standard of engineering in horse-drawn vehicles at the beginning of the twentieth century would be a mistake. State-of-the-art interiors of quality coaches were highly developed and gave their passengers a comfortable ride.

The passengers in the rear of the car had a view similar to the passengers in coaches. It was a panoramic view, looking at the landscape as it unfolds.⁶ This view, which does not look directly onto the oncoming road, was sometimes aided by longitudinal or even backwards seating for the passengers. The interior arrangement of early cars thus allowed two types of views to be established: whereas the driver and co-driver looked straight onto the road and into the landscape, the passengers in the rear seats viewed the landscape in a sideways fashion, preserving the older type of view associated with

Figure 4 Functional separation II: The driver is wearing a worker's flat cap, but the passengers in the rear are clearly upper class. Neubauer, H-O, Die Chronik des Automobils (Gütersloh, Munich: 1994), p31

*Figure 5 Shared tasks:
The driver of this typical
two-person racing car
is Louis Renault at
the Paris–Madrid race
(1903). His mechanic
has a lower position,
literally as well as
socially. Frankenberg,
R v, Matteucci, M,
Geschichte des
Automobils (Künzelsau:
1973), p130*

journeys by rail or by horse-drawn coach. Moreover, the early car had clearly separated interior spaces: there was a front–rear separation between driver(s) and passengers, and the front driving position was also split longitudinally into a driver’s and a mechanic’s ‘workplace’.

One of the attractions of early electric cars, apart from their easy starting and driving, was the relative lack of the controls and mechanical devices which were so obtrusive in early petrol cars.⁷ A driver of an electric car was able to concentrate his attention on driving, instead of on minding a machine. A contemporary German science-fiction writer, intent on identifying the most advanced road vehicle, saw this as a main attraction of electric cars, securing their future: ‘It will only require a short span of time until the intelligent mechanic will come down from the box of his petrol coach and give space to the simpler coachman, who will be able to steer his electric vehicle through the dense street traffic careless of the car mechanism.’⁸

When taking a leap forward to the late-twentieth-century car, it is evident that Hans Dominik’s early vision of ‘de-mechanised’, simple driving has come true – but in the form of the petrol car. One of the functions of early driving has more or less disappeared. Most of the engine’s systems are now fully automatically actuated and require hardly any attention by the driver. She or he does not have to deal with ignition timing, lubrication or fuel-supply pressure any more.

The driver has been relieved of the machinist's tasks and the driving function has properly been 'liberated'. A motorcar is no longer 'served' – it is driven.

This development is typified by changes in the types of gauges fitted to cars (Figure 6). In general, two groups of gauges, serving different purposes, are evident: gauges for monitoring the 'driving machine', and gauges supporting proper driving. The car of the 1920s had many of the former – voltmeters and ammeters, oil pressure gauges and water thermometers. Experience and technical knowledge were required to interpret the gauges in order to judge the state of the engine and its auxiliary systems. Instruments to aid driving were almost non-existent until the 1920s: even speedometers were non-standard.

The grouping of these instruments was not standardised at first; indeed even today designers have a certain amount of freedom. Whereas the speedometer is commonly placed in a central position, some sports-car manufacturers, such as Porsche, place the revolution counter in this most prominent position, thus highlighting the dominant engine function of their cars.

But the common positioning of gauges on or in the dashboard is a later feature. In very early cars there were often only switches or oil-drip sight glasses directly connected with the innards of the engine,

Figure 6 Until about 1935, gauges were commonly positioned in the middle of the dashboard so they could be read by driver and co-driver alike. Stöwer automobile, late 1920s. Appenzeller, O, Polizeirat Keller, Kraftfahrer und Kraftfahrzeug. Für Studium und Praxis (Stuttgart: 1928)

and pumps for maintaining pressure on the fuel tank. Speedometers found their place on the running boards, whereas temperature gauges were placed directly on top of the radiator, far in front of the driver but close to the mechanical components they were monitoring. This evidently is 'MS-DOS' compared with the 'Windows' of later dashboards, where there is an additional level of 'user-friendly' but indirect instrumentation.

Today there is a significant trend towards abolishing gauges altogether, or substituting them with warning lights. The trend towards digital monitoring which began in the late 1950s – for example in the Citroen DS – can be interpreted only as an interlude. It has been put forward by various designers that digital gauges cannot compete with analogue instruments where ergonomics are concerned. The latter seem to be much more readable at a glance, whereas the driver has to 'convert' digital information. Today, the typical analogue meters, which had to be interpreted by experience and knowledge, have been supplanted by warning lights. These operate with a zero/one logic, i.e. they indicate 'normal status' or 'crisis'. Knowledge of how to interpret changes is no longer essential. If a crisis is shown – for example if the oil warning light shows – the driver is supposed to stop and bring in support systems. In several types of car built in the 1990s this was even taken one step further. The warning lights themselves were hidden in a darkened dashboard, showing only very briefly when the key was turned and the ignition switched on. Such hidden information on the status of the machine is brought to light only in an emergency, in the 'crisis' mode. Often the driver will only become aware of the existence of a warning system in such a situation. Because of the potential invisibility of malfunctions in modern cars, several new types of control and warning lights have been introduced in recent years, such as warning lights for the function of air bags or the lambda function for catalytic converters.

In contrast to the trend towards fewer gauges, new types of information-giving devices that support driving itself have become more common. Examples include trip computers informing the driver about fuel consumption, average speed or the external temperature. This trend began with the clock on the dashboard. Widespread use of electronic devices took on a new significance with the introduction of satellite-based global positioning systems (GPS) providing cars with navigation systems. So far the 'battle of the systems' has not led to a standard for car-based navigation systems; nearly every large manufacturer uses its own version. In general, though, a small screen in the middle of the dashboard has become a common feature in more expensive cars, and communication technology is now firmly established as a driver's support system. Such technology will certainly acquire more importance in the future, helping to combat some of the serious problems of contemporary driving: systemic difficulties which

dominate the driving experience, such as congestion, can be detected, warnings issued and traffic rerouted.

In addition to these new guidance networks, private communication devices or cellular phones compete with specific in-car accessories as car mountings and open microphones are becoming more and more common. These communication sets tend to complement the transport function. Increasingly they are used to compensate for problems encountered while driving, for example to communicate that the user is stuck in a traffic jam and will be late. Communication devices have therefore established themselves as an indispensable part and as a necessary element of today's road transport. The consequence for the interior of the car is that it tends to acquire an 'office' character, becoming a new type of mobile workplace. New forms of crossovers between the 'work' of driving and other types of work have been established: truck drivers watch TV on tiny LCD screens, company car drivers receive fax messages, and the use of cellular phones has become ubiquitous.

All this began, of course, with car radios, which were introduced in the United States in 1926.⁹ In Europe they have been in use since the 1930s, although here they met resistance because it was claimed that the necessary concentration of the driver would be at risk. This seems to be a general observation: the introduction of nearly every new feature which enhances the 'living-room' character of the car interior is opposed by persons trying to defend 'pure' driving. But the defenders could soon point at the new feature of 'traffic news', introduced in the United States in the 1950s, which broadcast information about traffic jams and other hazards to drivers, thus making the radio an element of improving road safety. This 'utilitarian' aspect of car radios has gradually been supplanted by their entertainment value, allowing drivers to create and enjoy their own artificial and private sound environment. Sound quality was greatly improved by the introduction of the FM band, and today's stereo in-car entertainment systems, integrating cassette and CD players with complex speaker set-ups, have become very elaborate. Yet another car-based subculture has been established.

Back to the aspect of working a machine: there are significant relics of this task left in modern cars. Obviously, there are more traces of it in sports cars than in family cars, and more in European cars than in American cars. Gear shifting is probably the most significant relic of the activity of machine operation, requiring considerable skill when shifting with a non-synchronised gearbox. To avoid the driver being distracted, this had to be done 'automatically', without thinking. From very early times, driving education attempted to teach this by making learners avoid looking at the gear-shift lever and instead shift by hearing. But since the 1930s, technical means to facilitate this task (e.g. synchronisation) have been introduced, even in Europe.

The trend towards automatic activation of all components – not only those of the engine – received a boost in the 1990s.¹⁰ Electrically operated windows, mirrors, door locks and seats have become a feature of even lower-priced cars. This stresses the tendency towards concentration on driving. The shift from working a driving machine to driving proper has often been explained by the fact that cars and their engines and subsystems have become more reliable. But this is only part of the picture.

Slow development of the interior: from open to enclosed car

Early cars were completely open – more or less. Even ‘enclosed’ bodies were open to the elements, and there were no side glass panels.

The windscreen was not commonplace until 1905. From then on it was usually fitted as a standard feature, but it was either foldable or made in such a way that the top part could be tilted so the driver could peep through a slit. These ways of folding or tilting the windscreen were not only a necessary measure against the all-pervading road dust with which the windscreen quickly became coated (Figure 7). They were also a safety feature – there was no safety glass and in case of an accident the windscreen (or any glass) had better be safely out of the way of a passenger impact. Windscreen wipers to keep the glass clean when in place were introduced before the First World War; a patent (DRP 204343) on them had been taken by the Prussian Crown Prince Heinrich in 1908.¹¹

Brake levers and gear sticks were outside and had to be operated by moving one’s arm out of the interior. This was rather cumbersome

Figure 7 An illustration by Pierre Dumont accompanying an article on dust – a ubiquitous problem in the early motor era of the 1920s. The separation of the driver and passenger compartments is evident. (© ADAPGR, Paris and DACS, London 2003) Frankenberg, R v, foreword to Guichard, A, Die Pionierzeit der Automobilisten (Bern, Munich: 1965), p94

when fixed body sides were present. In consequence, the gear-shift lever and brake moved in from the outside and into the middle of the driver's compartment. This seemed at first to be a reversal of the general trend towards keeping 'machine gear' out of the interior, but on the other hand it was consistent with the tendency to integrate all components in the driver's compartment (Figure 8).

Open touring automobiles gradually became less common after the First World War, and there were several types of design before a proper 'interior' was developed. The last stage was the sedan, named *Innenlenker* (inner steerer) in Germany in the 1920s. Sometimes the driver would sit in the open, whereas his passengers enjoyed an enclosed body, as in the 'city cars' of the period. This idea had its counterpart in contemporary aeroplanes, e.g. the Junkers F13 of 1919. Thus the separation between 'operator' and 'passenger' compartments was actually strengthened. Theories were put forward to justify this arrangement: it was said that in order to fly a plane one has to feel the slipstream, and the pilots had to be in contact with the air. As late as the Second World War some pilots preferred to fly their enclosed planes with hoods pushed back for reasons of 'feeling'. In the case of road driving, similar claims have been made, but passengers, freed from all driving tasks requiring 'road contact', could enjoy an increasingly comfortable enclosed interior.

This process in which the car body became completely closed, which L.T.C. Rolt termed 'probably the most striking phenomenon in the history of the motor trade',¹² initiated a redefinition of the car. The comfort of these types of vehicles (which became a 'delightful living room on wheels', in the words of one 1920s commentator)¹³ defied the idea that cars were rugged adventurous playthings. By acquiring the comforts of a mobile home, cars progressed towards being a truly practical means of transport, keeping their passengers warm and dry. The advent of the market for closed cars, an important step on the route from 'adventure machine'¹⁴ to transport vehicle, thus brought to an end the earliest motorcar era.

Figure 8 Serving a machine: shifting gears and using the clutch. The individual steps comprise: 'free accelerator', 'activate clutch', 'operate gear lever', 'release clutch' and 'depress accelerator'. From an Austrian study book for learner drivers, 1922. Schmal, A, Die Kunst des Fahrens (Vienna: 1922), p51

This leads to the question of the agents of change for the trends described. The reasons for the introduction of enclosed bodies – the ‘most significant design invention’, as Virginia Scharff termed it¹⁵ – are complex. There are certainly technical reasons, caused by the tendency to use pressed steel and monocoque bodies in order to facilitate mass production. Abolishing the use of wood, which was one of the factors limiting production on fast-moving assembly lines, played a part as well.

But more significant were the changing car culture and the changing demands of buyers and drivers. First regarded by contemporary engineers as typically being for women, closed bodies were soon bought by men too. There is a controversy about the gender issue of closed cars.¹⁶ It has been argued that men declared closed cars to be ‘women’s cars’, but nevertheless enjoyed the comfort they provided, while still upholding the older ‘sporty’ and ‘virile’ image of open tourers. The result was clear: coupés, saloons and other closed-body styles soon took over the main share of the automobile market. But it has to be pointed out that open cars were and are coded in different ways in different car cultures. The US car culture was pioneering the trend, as it did in other features of car culture, but drivers in countries like Britain did favour open cars for a longer period.

With the introduction of fully-enclosed bodywork, a discussion arose about the dangers and merits of this feature. Similar theories as in the case of aeroplanes were debated: open bodies were obviously regarded as more ‘sportsman-like’. In addition, it was assumed that they prevented the driver from becoming tired, gave a better view of the road and were much more safe. This last feature was important, since closed bodies not only cut drivers off from the surrounding traffic but also presented a danger in the case of an accident of splintering. Moreover, they induced ‘limousine illness’, defined as slow poisoning by carbon monoxide owing to exhaust gases being drawn in. A German textbook for gentlemen drivers of 1922 sums up:

It would be sad if our weatherproof open air drivers gradually degenerated into limousine people as one only has the true sporty enjoyment of car driving in an open automobile. But the car is not only a sports vehicle, it also serves serious practical needs.... An argument that can be brought forward against [the inner steerer] is that the driver is separated from the outside world in such a vehicle. But this has little meaning. If one drives a little slower with an inner steerer than in an open air car ... then, as I can conclude from my own experience, accidents will be as rare as with an open car.¹⁷

The 1920s was the most significant period not only for the development of the closed-body car but also in terms of creating its social acceptance. There was no longer any need for specialised travel clothing, hoods or goggles for eye protection, which confirmed the transformation of the car from an item of sports equipment to a practical transport machine. By abolishing the need for specialised

travel clothing and headgear, which was regarded by many as cumbersome and even disfiguring (goggled drivers were a staple feature for caricaturists), cars could be integrated into everyday life. The rule was: the more domesticated and bourgeois the user, the more closed the car.

But even the open car had its attractions as a self-contained travel capsule. Eugen Diesel describes the cluttered but comfortable interior of an open NAG (*Neue Automobil Gesellschaft*) during a journey to Italy in 1905: baskets, umbrellas, travel coats and food baskets filled the available space completely, making their car an untidy 'home from home'.

Finally, the tendency of enclosing and creating a 'mobile living room' extended even to two- and three-wheelers. This might seem rather unlikely, but the popularity of sidecars, which in the interwar period in Germany could even be enclosed with folding hoods, is symptomatic. The success of the scooter after the Second World War was partially a result of its 'civilised', partially enclosed character.

A significant trend: towards an artificial environment

The introduction and increasing dominance of the fully enclosed body had several consequences. One was that elements of the car exterior ceased to form any part of the interior (Colour plate 5). On the majority of models the inner fairings of passenger doors are now completely concealed. Visual traces of the enamelled exterior panels of the car body, which were common until the late 1980s, are substituted today by plush interior fairings (Colour plate 6). Carpets are common even in the cheapest models.

In addition, the bonnet and other exterior parts of the car are increasingly no longer visible from the interior. Sloping bonnets dictated by (symbolic) wind-tunnel design are often completely outside the driver's field of view. Drivers of contemporary cars are seldom able to see the corners of their vehicles, a fact often criticised by car sceptics. As a result, all drivers usually see from their own cars is the interior. In some cases they are unable to see a single square centimetre of the body shell, so cannot even see what the exterior colour of the vehicle is. Consequently, the 'surrounding machine' is played down for drivers and the interior becomes their visual world.

The complete enclosure of the passenger compartment was only the first step in the process of separation from the surrounding environment. Gradually, the closed car body came to be complemented by safe and well-controlled heating devices. Until the 1930s such devices were mostly simple 'add-ons': basic charcoal heaters or hot water bottles. Ways of using the waste warmth generated by the engine were later fitted as standard. These had to be incorporated into the design of the car, since the heat exchangers and the air ducts into the interior could hardly be added as an

afterthought. Later still, air conditioning and cooling systems became available. But the terminology remained uncertain at first: *Klimaanlage* (air conditioning) in a 1950s German car advertisement meant an 'automatic' heating system where additional fresh air could be led in to be mixed with warm air, and air ducts were integrated.

True compressor-operated cooling systems, which had been standard for decades in American cars, caught on rather late in Europe. Today, more than a third of new cars sold in Germany come factory equipped with an air-conditioning system. To take isolation from the surroundings a step further, many expensive cars are now equipped with a very fine mesh or even activated charcoal filter to effectively remove pollen and dust. The tendency towards seemingly total independence from the environment is obvious.

Glare is also blocked out: tinted glass, originally intended as a means of reflecting sunlight to keep the interior cool, has acquired the additional function of making the compartment invisible to onlookers from the outside. Cheap add-on tinting foils were popular for a time, but suffered from blistering and splitting. Since the 1980s, many manufacturers have supplied factory-fitted tinted glass. Complete tinting of glass panels, as popular in American car culture as it is in India, is illegal in Germany and other EU countries. But the add-on detail of light tinting of side and rear glass proved to be very popular in Europe in the 1990s.

Another step in the long trend of isolating the interior is soundproofing of the car. Insulating carpets, quality cloth covers, padded mats, padded bonnets and better sound-isolating glass panels all contributed to this. Double glazing, though, was a short-lived feature, introduced in the heavy S-class Mercedes of 1992 but omitted again in more recent models. Better sound isolation, and the introduction of more and more elaborate sound systems, has led to the aural environment also becoming increasingly private. Better wiping, cleaning and demisting systems for the windscreen have contributed to the feeling of drivers and passengers that they are not connected to the road, inhabiting an artificial environment with many of the domestic features drivers are used to in their homes. (In fact, his home might be equipped in a much less elaborate way.)

This becomes evident when inclement conditions prevail outside the vehicle. Modern motorists hardly seem to be affected by sleet, snow or fog. They inhabit private 'technoid cells', connected to the outside temperature only by an electronic thermometer. But this is evidently a false proposition: under these conditions the speeding private interior can fail spectacularly. To be cut off from 'natural' phenomena like ice on the road may prove fatal if the technology means they are noticed too late.

Not only is this interior now dominated by artificial temperature and sounds, but even the driver's sensitivity is affected. Better seats,

suspension systems and roadholding contribute to a completely different feel: the driver is less influenced by centrifugal and other dynamic forces and by the feel of road surfaces. Every driver of today's cars experiencing a 'classic' car is immediately aware of this: earlier cars seldom have this 'engineered' stability. Physical forces are much more evident, as there are closer connections with the road conditions.

However, one can find relics of the 'old paradigm' in some older car types still in use, such as the Citroen 2CV. In this car, with its anachronistic features, direct contact with the air outside is possible by opening a flap to allow in air directly under the windscreen. But, usually, modern cars also have fresh-air ducts in the dashboard. Folding and sliding roofs, often in addition to air conditioning, have become popular options. Ergonomics, a key word in interior design, is partly responsible for the introduction of electrical and automated elements. The ergonomic aim is to make drivers and passengers more comfortable in their speeding cells and to structure the machine according to the driver's needs.

The consequence is a trend towards a total 'uncoupling' of drivers and passengers from the elements, the surrounding landscape, the driving environment, and from other drivers in their cars. Therefore drivers are isolated in their machines and separated from the systemic transport environment. The development and the special structure of the interior heighten the image of 'lonely and free' driving. I would not go as far as to label the interior of the car as a skull, as Finch did ('In a sense, the shell of the automobile is a steel cranium, a protective enclosure.').¹⁸ but the isolation of drivers in their speeding cells had consequences for their feelings of protection and autistic isolation, and their attitude towards the task of driving.

Two conflicting functions of the interior: driver's workplace and living room

Tension between the two functions of the interior, which had been latent even in the open car, broke out when enclosed cars became standard. Two different ideas of the role of the interior are reflected in its design and functional elements, which illustrate this conflict clearly up to present times. Passengers enjoy the living-room quality to its full extent. But even the driver himself performs his tasks in an environment that has acquired a living-room quality.

In the 1920s and 1930s there were two firmly established car paradigms: the adventurous sports car, which was basically an open car that could be closed, and the functional sedan (or family car), which was closed but could be opened (*Cabriolimousine* in Germany). These two paradigms tended to merge in the 1960s and 1970s. Even in 'sporty' types of cars, the amenities of closed cars – such as heating or sound systems – were included, whereas the family sedan acquired a more sporty character, not only from increased power output but

also from redesigned interiors. Some crossover types set trends, for example the Ford Mustang. Consequently, when cars as driving machines and cars as intimate transport vehicles took on similar shapes and configurations, the functions of the driver's workplace as a machine panel and as a piece of domestic interior converged. It was now possible to control the speeding machine and to enjoy the interior simultaneously, making the driving experience a highlight of everyday life.

A trend to include more and more features previously not found in the standard specifications confirms this. Most significant is the point where optional interior elements become standard, appearing in even the most basic models. Generally, the introduction of features in cars comes in a sequence: first, new features are sold by specialist shops, then they are made available by the manufacturers as optional extras, then these are incorporated in the 'upmarket' models, and finally they become standard equipment in basic models. This sequence can be exemplified with car heating. Until the 1930s there were several manufacturers of mobile heaters, employing different principles of generating heat. From the 1930s onwards, heat exchangers were available as expensive extras for more expensive cars. Only from the early 1960s did cheaper cars have heating systems that blew in heated or fresh air (this was called *Klimaanlagen*, air conditioning, in German car advertising, although it did not supply chilled air) as a standard feature.

One can trace influences from contemporary interior design on car interiors. Fitted carpets became a common feature at roughly the same time in homes and cars. Colour schemes, too, have been developed in close relation to each other. Wood panel inlays were a fashion in British homes and cars of the 1960s, but were not very popular in Germany. The 1970s saw an upsurge of bold colours invading the car interior. Today designers aim for a unity of appearance of all car elements. This striving for a unified appearance and these attempts to integrate every element that characterises car design have probably not yet come to an end.

Is this true in the opposite direction? Does contemporary interior car design influence interior decoration? It seems so. Car interiors are more avant-garde and could set trends. Drivers and passengers generally enjoy a 'better' – in the sense of better engineered, designed and coloured – environment in their cars than at home. Better materials and more convenient electrically operated features are present in their cars. If ergonomics or 'adaptability' of furniture is characteristic of modernism, as Sigfried Giedion argues,¹⁹ these features will probably move from cars into homes in the future.

The split between the two functions presents a problem for interior designers aiming at a unity of appearance. Today the 'machine' elements necessary for driving are functionally separated

but stylistically integrated. Since the 1950s, instruments have been concealed deep inside the dashboard. If they are boldly displayed, they are in harmony with the 'living-room' interior. A typical element that could cause functional or stylistic problems is the gear lever. To integrate it, this clearly technical component is given 'living-room design' by the same material being used for the knob as for the fairing or dashboard padding. A sack-like device conceals the lower end, which is the mechanical 'core' of this element, allowing it to move. In cars of the 1950s the gear lever often ended in a slotted frame, allowing a view of the gear-shifting mechanism.

But this stylistic concealment of technical elements seems not to be the end of the development process. The car industry is preparing for the realities of an overloaded road transport system where the act of driving may be played down even further. Development is moving beyond the navigation aids that are now options for buyers of more expensive cars. Automatically guided systems which substitute the act of driving with various means of electronic control are now beyond the experimental stage.²⁰

Vehicles themselves are being adapted to the realities of car travel today: designers are increasingly regarding child passengers as important. They restructure the interior to meet the specific needs of children, integrating special seats, window shades, pouches, tables and lockers. The 'jam car' concept produced by Volkswagen specialises as a mobile family living room, complete with refrigerator and front seats that can be turned around to reunite the family circle. This vehicle significantly plays down its role as driving machine. Here the balance is shifted yet again towards the 'living-room' character.

Safety and the interior²¹

Emphasis on the 'living-room' function will probably continue to increase. The history of the introduction of seat belts makes an interesting case study of the conflicting roles of car interiors. Since the 1960s, seat belts have been broadly recognised as a major contribution to car safety. Their technology was transferred from civil aviation. Hugh de Haven, an academic safety researcher at Cornell University, introduced two-point seat belts in the United States in 1955. The patent for the three-point belt common today was granted to Swedish engineer Nils Bohlin of Volvo.

But this safety feature was fiercely rejected by users at first. Early safety belts had a feature that made them uncomfortable to wear: they were fixed, which meant that a person using them was unable to move more than a few centimetres. Obviously this conflicted with the demands of 'sitting-room' comfort and explains the strict opposition to wearing safety belts at the outset. The long struggle to make them compulsory was helped by the introduction of 'automatic' seat belts, activated by inertial blocking of the mechanism, which allowed the

wearer much more movement. But still the very fact of being restricted produced – and to a certain extent still produces – opposition. The state's interference had to overcome the insistence of drivers on their 'living-room' comfort, even if their lives were at risk.

The core of the safety discussion thus was the question of the function of the interior of the car. Persons opposing safety devices did not want to have the attractions of their mobile living room spoiled. They insisted on preserving the image of the car interior as a comfortable, seemingly indestructible and invulnerable shell. The very real risk involved in driving should not manifest itself as an object like the seat belt. The industry reacted to this attitude of their customers by attempting to develop other safety devices that did not restrict the enjoyment of the interior. Preferably, they would even be hidden out of sight until the point of crisis, i.e. the crash.

This was one important incentive for the development of the air bag.²² This device was intended to be used on its own, without having to rely on seat belts, therefore providing 'invisible' protection which did not get in the way of a comfortable interior. It did not fulfil the hopes of its designers, since it works properly only in combination with safety belts and head rests. These continue to be the reminder that the moving living room is driven in a very dangerous and potentially lethal environment.

Safety belts have now been accepted after being made compulsory for drivers and passengers. Since the automatic roll mechanism has made them more comfortable, there has been a tendency to adapt their appearance to their surroundings. Coloured seat belts, matching the colour scheme of the interior, are now quite common. More significant is the complete concealment of their mechanism. In today's passenger cars the roll mounted near the floor is completely invisible: the seat belt disappears into the interior fairings. This serves the purpose of integrating 'technical' elements and keeping the 'living-room' interior visually intact.

Another solution for making the car interior safer actually enhanced its 'living-room' quality: the trend of padding the dashboard and recessing switches and levers in order to 'defuse' hard edges and to soften their 'secondary impact' in case of a collision. Crash tests in the late 1950s had proved this measure to be very efficient. It was slowly introduced by Mercedes Benz and by US manufacturers as an optional extra. A decade later nearly all cars had padded upper and lower dashboard edges and soft knobs, thus transforming the somewhat harsh-looking metal dashboards into integrated parts of an interior dominated by fabrics, plastics, fairings and coverings. 'Naked' enamelled sheet metal later disappeared from the instrument panel, and finally from doors as well.

At the other end of the spectrum, apparently moving away from the integrated 'living-room' image, sports cars seem to display more

of their 'technical' interior elements – from a prouder design of their gauges to 'racing' or 'rallye' gear-lever knobs and pedal surfaces. Even four-point or 'garter' belts, as used in racing, are found in sports cars. But even these cars, intended or sold as 'pure driving machines', such as the Porsche 911SC with its reduced interior padding and fairing, kept a minimum of 'living-room' comforts. Moreover, 'rallye' details in contemporary cars are seldom only functional elements. Mostly they are symbolic add-ons, transforming still comfortable interiors only visually into 'sporty' cockpits.

Even the tendency towards reintroduction of open roadsters and 'rag-top' cars, which occupied a growing share of late-twentieth-century car markets, is only superficially contrary to the growing intimacy of the car interior. Motivated by the opposition to and dissatisfaction with the described tendencies towards speeding living rooms, roadsters seem to offer the desired distinction quality by recreating the older image from the 1920s of pure driving machines. But even these open cars today share the amenities of enclosed bodies – for example two-layer tops, efficient heating and sound isolation – and they are driven more and more in enclosed mode. Therefore they could be labelled post-modern roadsters. The trend towards a closed, intimate and isolated interior is unbroken. The driving-machine image is not a substitution of the living-room image, but an addition with only a slight twist.

This has consequences for the attitudes of drivers. They feel detached from the environment and from the surrounding traffic in their private interior. In consequence they feel less part of a system and more a 'lonely-and-free' individual in an isolated vehicle. This goes far beyond the observation that 'the driving experience became easier, and at the same time somewhat passive'.²³ Recent developments in electronic devices aim at interfering with the autonomy of drivers from different directions: there is automatically activated braking when the distance to the vehicle in front decreases, or power-assisted emergency braking. These devices 'help' drivers to avoid a crash, but in fact take over central driving functions and make drivers more passive. Experiments with fully automated driving without active driver participation are much discussed now, but even below this level 'the system' will be able to interfere, for example by limiting the top speed when entering towns. The required technologies already exist – introducing them is the question. The trend towards telematics – 'dialogised' guiding or automated driving devices – fits into the history of automation of automobility: first the burden of 'serving' the machine was taken from the driver, and now driving in the traffic system and navigating is on the verge of being replaced by electronics.

It is remarkable that these modern electronic devices which alter the act of driving are quite unobtrusive in the interior. They hardly make their presence felt, but they influence the 'user surface' of the

car indirectly. Even so, passive drivers can be made to enjoy their isolation. A case in point is the traffic jam. This increasingly common event – which could be described as the maximum intrusion of the systemic into the illusion of the private, the denying of the ‘freedom of the road’ by the dreaded system – does nothing to destroy the myth of ‘lonely and free’ driving. On the contrary: in the traffic jam drivers, relieved from their driving tasks, are able to enjoy the ‘living-room’ features of the vehicle’s interior to its fullest extent. Comfortable interiors therefore tend to make the demands and systemic restrictions of modern traffic tolerable and even offer ample compensation.

To conclude, this article has pointed out that the negation of the systemic aspect of road transport and the stress on isolated, individualistic driving have been strong factors in the success of the car.²⁴ Of course the image of isolated driving and the consequent playing down of the system have complex causes. But the situation of modern drivers confined to their speeding living rooms has played its part in keeping alive this objectively obsolete image of antisystemic individual motor vehicles, even in the highly systemic mass transport systems of the late twentieth century.

Summary

The development of the interior of passenger cars has reflected changing attitudes towards the act of driving and shows different concepts of the interaction between driver and vehicle. Therefore, the history of the motor-vehicle interior, its ergonomics and decoration, is significant for the most important man-machine relation that has been established so far. Interpreting the passenger compartment as a crossover between ‘cockpit’ and fast yet intimate living room helps us to understand the attraction of motor vehicles.

Notes and references

- 1 Recent texts have included: Gartmann, D, *Auto Opium: A Social History of American Automobile Design* (London, New York: 1994); Kieselbach, R, ‘Vom Torpedo-Phaeton zur Ganzstahl-Limousine: Zur Geschichte des Auto-Designs’, in Zeller, R (ed.), *Das Automobil in der Kunst 1886–1986*, exhibition catalogue (Munich: 1986), pp287–97; Möser, K, ‘Autodesigner und Autonutzer im Konflikt: der Fall des Spoiler’, in Schmid, G (ed.), *Technik und Gesellschaft. Jahrbuch 10: Automobil und Automobilismus* (Frankfurt am Main, New York: 1999), pp219–36.
- 2 See, for example, Ludvigsen, K E, ‘A century of automobile comfort and convenience’, *Automotive Engineering*, 103 (1995), pp27–34.
- 3 Möser, K, ‘The First World War and the creation of desire for cars in Germany’, in Strasser, S, McGovern, C and Judt, M (eds), *Getting and Spending: European and American Consumer Societies in the Twentieth Century* (Washington DC: 1998), pp195–222

- 4 Dr St, 'Kauf und Behandlung eines Automobils', *Der Stein der Weisen*, 28 (1902), p43
- 5 Diesel, E, *Autoreise 1905* (Stuttgart: 1941)
- 6 Schivelbusch, W, *Geschichte der Eisenbahnreise: Zur Industrialisierung von Raum und Zeit* (Frankfurt am Main: 1977)
- 7 Mom, G, *Geschiedenis van de Auto van Morgen: Cultuur en Techniek van de Elektrische Auto* (Deventer: 1997)
- 8 Hans Dominik in 1904, quoted by J Wachtel in the preface to *Querschnitt durch frühe Automobilzeitschriften* (Bern, Munich: n.d.), p11
- 9 Bussien, R (ed), *Automobiltechnisches Handbuch*, 14th edn (Berlin: 1941), p1231
- 10 Ludvigsen, K E, note 2
- 11 von Seherr-Thoss, H-C, *Die deutsche Automobilindustrie: Eine Dokumentation von 1886 bis 1979*, 2nd edn (Stuttgart: 1979), p37
- 12 Rolt, L T C, *Horseless Carriage: The Motor-car in England* (London: 1950), p113
- 13 Scharff, V, *Taking the Wheel: Women and the Coming of the Motor Age* (New York: 1991), p125
- 14 Mom, G, 'Das "Scheitern" des frühen Elektromobils (1895–1925): Versuch einer Neubewertung', *Technikgeschichte*, 64 (1997), p271
- 15 Scharff, V, note 13, p122
- 16 Scharff, V, note 13; Scharff, V, 'Gender, electricity, and automobility', in Wachs, M and Crawford, M (eds), *The Car and the City: The Automobile, the Built Environment, and Daily Urban Life* (Ann Arbor, MI: 1992), pp75–85
- 17 Filius (Schmal, A), *Die Kunst des Fahrens. Praktische Winke, ein Automobil oder Motorrad richtig zu lenken* (Vienna: 1922), p176f
- 18 Finch, C, *Highways to Heaven: The AUTObiography of America* (New York: 1991), p327
- 19 Giedion, S, *Die Herrschaft der Mechanisierung: Ein Beitrag zur anonymen Geschichte* (Frankfurt am Main: 1982), pp528–51
- 20 Schuh, H, 'Freie Fahrt in der Kolonne: Intelligente Elektronik koppelt Fahrzeuge aneinander', *Die Zeit* (17 June 1999), p27f. This trend was criticised by Wolfgang Zängl in *Der Telematik-Trick: Elektronische Autobahngebühren, Verkehrsleitsysteme und andere Milliardenengeschäfte* (Munich: 1995).
- 21 See new literature on safety technology: Gnadler, R, 'Sicherheitstechnik heute und morgen', in *Mobilität und Gesellschaft: 150 Jahre Carl Benz* (Stuttgart: Daimler-Benz AG, n.d. [1996]), pp53–66; Niemann, H and Hermann, A (eds), *Geschichte der Straßenverkehrssicherheit im Wechselspiel zwischen Fahrzeug, Fahrbahn und Mensch* (Bielefeld: 1999); Weishaupt, H, *Die Entwicklung der passiven Sicherheit im Automobilbau von den Anfängen bis 1980 unter besonderer Berücksichtigung der Daimler-Benz AG* (Bielefeld: 1999).
- 22 Möser, K, 'Lebensretter für Insassen: der Airbag', *Schweizerische Technische Zeitschrift*, 7–8 (1998), p128
- 23 Finch, C, note 18, pp327, 283
- 24 Möser, K, *Geschichte des Autos* (Frankfurt am Main, New York: 2002), chapter 18.