

Forgotten genius

Brian Palmer talks to Albert K. Richter Dipl.-Eng about his idol Hans Ledwinka 'the forgotten engineering genius' and the incredible Tatra cars.

MANY magazine articles have been written about car design and industrial revolution which we know and love, but often, when analysed properly, many of these diagrams have merely adapted the work of others or have become well-known simply for one successful model. Very few work in a total vacuum untouched by others' ideas — though some might like to leave this impression.

The truly innovative engineers are few and far between, in Great Britain certainly so, and only become known in this way by continuing to make a clever package of previously used ideas and Dr Frederick Lanchester starting to bring the refinement of aerodynamic work. Though it's hard to believe, it seems that for Britain has never really been in the vanguard of innovative engineering.

The reason is partly accidental: the engineer has never enjoyed the status of the courtier or the statesman in this country. But for the most part it is a matter of the mind set which we have produced cars suitable for largely well-travelled roads over short distances and it is for weather. When circumstances demanded a more extensive network in the late Thirties, Great Britain could only boast about the Kingston bypass, so high speed road was never much of a British trade and well into the forties.

The history of European automotive engineering around the turn of the century was undoubtedly the old Austro-Hungarian Empire, with the seeds of invention sown to be nurtured, particularly of the technical high school in Vienna with its own automotive engineering faculty — and the resultant harvest of engineering talent is still to be seen today. Among their number were two contemporaries: Dr Ferdinand Porsche, probably one of the best known and most respected names in automotive history, and one Hans Ledwinka. When the recipient from many, he studied, and barely mentioned apart from it is explained that he was the guiding light behind some of the most starting and original ideas cars of the pre-Second World War period. Tatra, to most the work is almost completely unknown, but that it has been for a lack of history, the help of an 'Iron Curtain' between east and west in Europe. His right now been the forgotten name and not Porsche's.

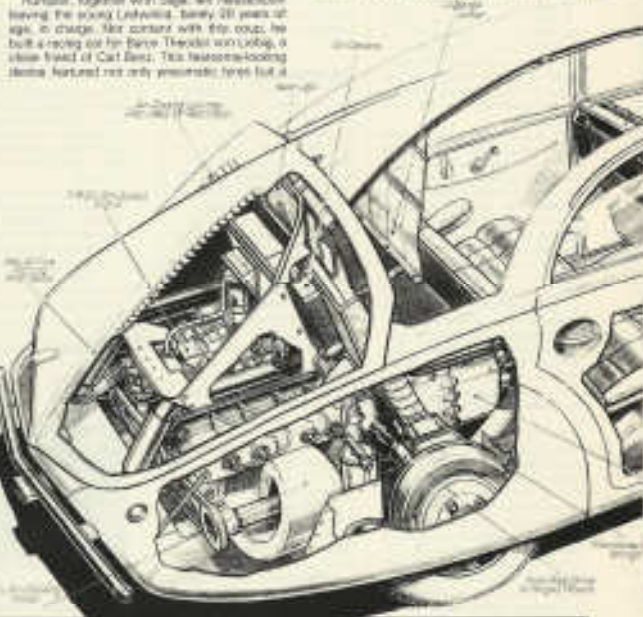
Hans Ledwinka was born in 1894 near Vienna in a town called Bludenzburg. Following his formal education he commenced his first work

in a typical technical school. Offered a job at a moment at the Waggonfabrik Ignaz Schickels in Neapelof in Mlada Boleslav (now called Kopřivnice) to work on a big Benz flat four-powered prototype motor car in 1917, he promptly resigned the position which had been the responsibility of the chief design engineer Edmund Humper. This first car, called Prototyp, was substantially drawn from the factory's plans for an exhibit — a distance of 27% miles — achieved in 142 hours.

Porsche, together with Selye, left Neapelof leaving the young Ledwinka, barely 28 years of age, in charge. Not content with this, he built a racing car for Franz Theodor von Lobkowitz, friend of Carl Benz. This two-seater-looking design featured not only pneumatic tyres but a

water pump and a water-cooled soft-roller anti-race gear for 7000rpm. Clearly the young Ledwinka was showing his mood.

Persons were following Ledwinka (developed) too; the car was the manufacturing process at Neapelof which had become such a hub of engineering activity due to the presence nearby of steel, iron and steel factories. However, the style early years of the factory soon became clouded by war; the Austro-Hungarian Empire was at the point of collapse and the directors of

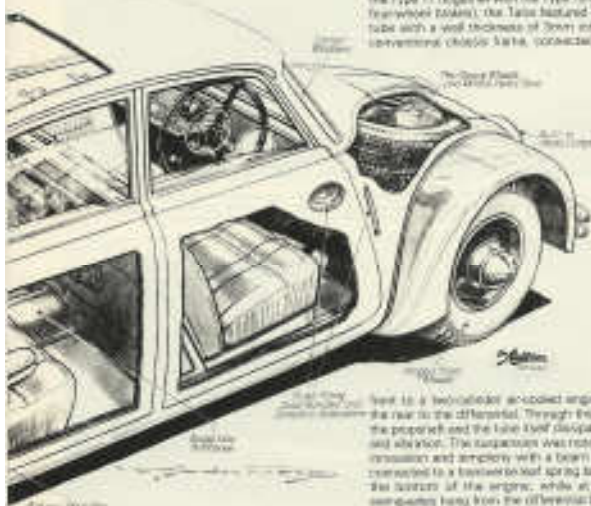


Neapelof spent money that Ledwinka wanted to produce about 1000 automobiles. After the war, he was offered a position as a motor car manufacturing plant at the war's end, though not approved Ledwinka to do it. He left for France in September 1917.

Although his first offering under the Opel brand was a development of the work at Neapelof, his six-cylinder inline engine had a tubular cylinder, an advanced that it became the model for students of engineering at German universities for many years. Further, the Type 2 car, 2 was turned out which appeared in 1920, proved his goal that it was possible to bring standard 10-horsepower engine and a vastly improved power output from its original 3.5-horsepower design. Ledwinka had achieved everything Selye had vowed him to do: he had set up a motor manufacturing base, his first design was a success and Selye's subsequent reputation was established on the legacy of Ledwinka's design and engineering. He also, among Ledwinka's ideas were a suspension, steering or body design (which proved over time) of engineering excellence and which saw form of his best engineering. It is said that Porsche took a job with Selye for a year merely to learn about their engineering suspension.

But a call from Neapelof company situated in the town valley at the foot of the Pilsener mountains proved too irresistible to Ledwinka. He returned in 1921 to start his own business in the Republic of Czechoslovakia. The factory gave birth to new name Tatra. Tatra, after the mountain range to the east that is so that country where the Alps are in Austria or Switzerland.

His new car for Tatra caused quite a stir when it was first shown in Prague in May 1923. Not a trace of existing mechanical orthodox ideas above, it soon had that created a classic design the experience of which would have a considerable influence on future trends. Front of the Type 11 (engine with the Type 12) ledwinka had a wheelbase of 1100mm; the Tatra featured a 1100mm wheelbase with a wheel thickness of 20mm instead of a conventional 40mm, connected rigidly to



Below: Tatra 777 exterior and details below left to right show components. Like the classic, rear has also rear vision, one Mast right hand drive and engine bay cover.



the rear 400rpm, was it not great idealism to target their powerful cost of the period.

This clever light car remained in production for over seven years, by which time some 20,000 had been built. Such was their strength, appearing cars, their reliability and longevity that the Type 12, nicknamed 'The Mast', could still be seen recently, still in some numbers in the roads of Czechoslovakia. A further Type 12 was developed as a light commercial vehicle.

Quite understandably, this road of all was reserved for the 1925 Tatra 1500. This was the only time Tatra went racing with Ledwinka's blessing. Even more understandably was the fact that the two cars drove all the way to Selye and gained first and second place in the 1926 race driven by Fritz Hubert and Karl Sponer. The cars were perfectly standard apart from having two rear wheels instead of six, and the front two were half-jumping replaced by swinging half-axes. The same year Carl Gustaf Bernström took the 1926 Tatra 1500 to Moscow via Paris, to Moscow in a Tatra.

Whether Ledwinka became bored with the situation is not known but in 1932 he built for Tatra a luxurious and sporting model that could match anything available in Europe. The T40 featured a water-cooled 60-horse, 1000cc V12 engine connected to a direct shaft chassis just like the T-12. On this model the wheelbase was set in and with the gearbox for additional strength. The car had all-independent suspension, by means of leaf bodies to a location on the front of the engine and at the rear by swing-axes and sprung quarter-elliptic leaf springs.

As Porsche was attracted from these big concepts, Ledwinka's brakes were standard, together with large front discs. The car made its debut at the 1930 Paris Salon which may account for the Tatra's debut during the Paris T400 as a sensational new-Ford car. Many of the factors listed to this machine were not very conceptually hard-core, though this could not be said of the body constructed by Carl D. Pfeiffer-Maurice (the UK importer based in St John's Wood) shown at the 1930 London Show and 1932 to show of the smaller, opposed four-cylinder six-cylinder model.

By now Ledwinka was poised to make his biggest impact on the automotive world. T40 apart, he was concerned in developing and building, along with others in this time that such engines were massive and would eventually be shown in water-cooled cars. No doubt the better vision of control Europe encouraged this, the of finding with Porsche to Tatra, no longer to look out as Porsche proposed. A better advantage is that the engine is visible to make — certainly do not have to be integrated in the block — and the whole engine set is lighter than 44 wheel-axle model. But it does need a fan to cool the engine and this generates a good deal of noise. Ledwinka, therefore, decided that he would place the engine at the back, so that once under

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way, which would be left behind. Furthermore, the last suspension-wheel drive setup provides excellent traction especially when climbing hills. It also detaches any need for long drive shafts, henceless a source of vibrations, and this arrangement is far, smooth underdrives. This had proved a desirable feature during extensive Citroën research into semi-tracks and Lada's Type 77, first displayed in Prague on March 3, 1934, proved to be the first commercial application. This driving concept a fully steered line is leading, while at the front with a long steering bar. The rear again ideal when used in conjunction with a rear-mounted engine.

Lada's Type 77 is ultimate and excellent road car, so we must study it again to imagine its impact nearly 50 years ago. For a start it was a very light car with a wheelbase of some 6m feet. Yet it had a top speed approaching 100mph from an expected 3.4-litre V8 engine (planned all of the way through with the chassis set directly to front, forward as it was as that it could easily be reversed by reversing — rather like the tractor used Citroën in France).

The suspension was by semi-axles front and rear, the chassis a traditional type (transverse front shafts). This light weight frame, used to left springing, resulted in a truly excellent car which could be achieved at high speed over long distances in central Europe. In fact it was all of the first car built expressly to take advantage of the growing network of motorways in Europe. However, it had one flaw — a fatal flaw — one might say — because, like many revolutionary designs of today (only more so) it was susceptible to sideways wind, particularly when, in the case of the Tatra, this was accompanied by a high resistance and high pole position of inertia this disturbed effect of that large massed mounted engine. A further disadvantage of the design was the reliance on rear vision.

Some of these deficiencies were eliminated in subsequent model developments. In 1937, Lada's Type 37, a smaller 1.7-litre engine with arranged four cylinder engine at the rear. The car was remarkably like another car being worked on in Germany, the Volkswagen. The 37 was Lada's last design however. On October 10, 1939, the Germans marched into Czechoslovakia occupying the Tatra works.

Idolised

This seems an appropriate place to break off and recount something of the interesting life of Albert Richter who has related to me so many fascinating stories about Tatra and the forgotten genius' Hans Ledwinka. Albert Richter was, in fact born in Bratislava in 1896, moved to Bratislava part of the Austro-Hungarian Empire which subsequently became Czechoslovakia. The father worked as a farmer (which he is an aristocratic family, a very good job in those days it would seem, judging by the photographs I was shown of his family and his father's garden, built a large table in a splendid dining room, the walls covered with the articles of various deer. Albert Richter did not want to follow in father's footsteps (which he did, through his father's contacts he entered the Tatra works in 1924 to gain practical experience). During his time at Tatra he worked in most of the departments including experimental and design. He never accompanied the team down to Gola (to the Tatra Flood, but the biggest impression that the episode left on the young Richter was how



Above, go-anywhere Tatra type T77/72. Adolf Hitler travelled across thousands of miles in the Tatravia in one of these cars and it is said to have convinced him that the VW should be developed. Below, 1934 Volkswagen Type 1, a sturdy and robust car with a powerful six-cylinder engine.



not it all was, he did, however, get in touch with Ledwinka, who he found a great personality, though capable of great stubbornness. Nonetheless it would appear that the Volkswagen almost did and would do almost anything for him.

After four years at Tatra, Albert Richter returned to university and in 1931 graduated Diploma of Engineering. Unfortunately for him this coincided with the general trade slump and he could find no manufacturers to take him on. So he joined a small workshop garage in Bratislava as the 'chief' fitter, to repair cars. He also had an agency for Pack, Bagn, Opel and Jawa motorcycles. Hans Ledwinka had a castle nearby and Albert Richter would go to service his cars which included an Alfa Romeo, a DeSoto, an all-cylinder Austin and various DeSoto and Buick models. Also ordered for was the Tatra of the wealthy Justice Court Justice who supplied him with the Tatra factory. When these enterprises fell hardy before he would often be left with the visitors and to attend to

However, the political situation in Czechoslovakia was becoming strained and Albert Richter, as a Jew, did not like the political situation. He applied for various jobs in Germany and secured a post in 1933 at Opel's commercial vehicle factory at Eisenberg on the river Elbe, about 40 miles from Berlin. Unfortunately, though administrative work, he did not receive his letter of appointment and the firm, he knew what it was when he received a frantic telephone call asking him where he was, and to report to the factory immediately. Of course the Nazis were already firmly in control in Germany at the time and a war had declared a good idea to point out. The factory had a motor, AA Albert Richter could do was to head a team immediately, leaving instructions with friends to sell his business for him and over which he relies, he suffered terrible financial loss. He arrived at the Opel factory, which was one of the most modern in Europe at the time, as Chief Inspector of Quality



Top, post-war Tatra's sports car. Left, last of the line 815. Above, Lada's 1933 model from 1933. Below, post-war Tatra's 815 was developed from the Type 87.



Control. His boss at this time was Dr Hans Biedert who ordered the firm after the war to take over the VW factory. Richter remained that before the war Robert Ley, head of the German Labour Front, arrived at the Opel factory with a prototype Volkswagen to show the workers. They were encouraged to buy one (though it savings scheme whereby staffs in the value of five Reichsmarks were purchased and staff into a bank. The purchase price was to be 500, 3000 Reichsmarks. This was at a time when workers were already withdrawing one Reichsmark each month to finance production for the Fuhrer, and it is doubtful whether anyone ever received their 'People's Car' before the war finished. This had some impact on that day the whole idea was smothered as to provide money for the staff of the war effort, but it probably was some people at the time.

Final halt of course, being controlled by General Motors since the late Twenties and during the Thirties was General's biggest problem. During the war years, however, the factory was taken over and supervisory was made to ensure that all of the heavy production targets were met on time. As well as various tanks, personal cars and armoured vehicles were made other with four-wheel drive.

During the Russian campaign the factory contributed to Opel as the strongest possible tanks that were made by them (with a heavy-duty gear with gears and two-side drives). Albert Richter was called upon to solve the problem — otherwise tanks would not, including, probably to him. A crash programme was initiated which involved Richter in visiting Opel's Russian tank factory, checking the entire manufacturing process, adopting down endless number of vehicles and checking all the machinery and having that made the components. Everything approved carefully in order. Logically, therefore, according must be going with what the steel content of its manufacturing process. On a visit was made to the steel works in Banská, Epi-

stodlitz Werke. All the steel was analysed, the quality methods checked and nothing found to be wrong. When preparing tanks, the answer came to Albert Richter in a flash as he sat in an office high above the factory floor gazing down at all the activity below him and wondering how he would get the German High Command that he could find no reason for the mysterious failure coming from the steel. With typical German logic the various grades of steel were ranked and colour codes placed on their ends. On one line German tanks were painted left to right but on another line transport labour from steel to the Chinese border was painted left to right (both from right to left). They were resulting in the colour codes and consequently the wrong grade of steel were being used.

Albert Richter's knowledge and personal experience driving and working on Tatra and allowed him to be transferred to Czechoslovakia headquarters in Berlin. A number of high-ranking officials occupying Czechoslovakia were using the Tatra for official transport and at high speed, movements of the transport being one hundred to one hundred a number of them to drive to give. The army could not afford to lose its best men in the market and they began to visit Richter. The Tatra was the Czechoslovak export weapon against them. Richter argued that at modest speeds the Tatra was perfectly safe, in fact superior in many respects, to most vehicles then on the road. High Command was not convinced, however, and the order went out that Tatra were verboten.

Captured

Towards the end of the war, Richter had gone to this job was caught by the Germans (he was in England and Luxembourg in 1948) he was moved to England and Luxembourg in 1948. Later he was moved to Berlin and worked in Berlin's German Stock of the Royal Engineers at Berlin Court camp. Long before in a technical capacity. In 1952 he took advanced driver's test, had already received a school teacher and worked for many years with British Commercial vehicles. In 1961 he joined in a vehicle out of the German Highways and now lives quietly, alone, in a lovely rural in Luxembourg.

He reflects often on the time when he made the mistake Tatra and means that his partner is not spoken of in the same way that the Tatra case is revealed. Ledwinka indeed at the hands of the Russians when they reached the Germans as captives at Czechoslovakia — they stayed in prison for 10 years of collaborative charges. He would not have met by his post Dr Jozef Hlavinka and the last Tatra design conference to his day, made in small numbers for top-ranking Czechoslovak officials. The Tatra name is also recalled as a target of excessive rough trade which are featured in some of the more dramatic and geographically varied regions of the USSR.

After his imprisonment Hans Ledwinka was allowed out of Czechoslovakia with only three of his clothes he was wearing to take with him. He found some solace with his son Erich, and engineer at Tatra's Bratislava who had been responsible for the Tatra 815 and the H4144 four-cylinder vehicle. He became something of a celebrity among the engineering fraternity in Munich in his visiting years, which must have given him some comfort. The old Ledwinka friendship was revived somewhat by an act of court settlement made by VW with the western branch of Ringier's Tatra (Munich) West for abandonment of some Tatra developments. Also Ledwinka himself received no compensation and through his friend Felix Hlavinka offered to undertake the cost of an action, the way not taken up. Hans Ledwinka died quietly at Bratislava on March 3, 1980, just after his 84th birthday.