

AUTO EVOLUTION

Park a modern car next to a century-old antique, and it's hard to see how one evolved into the other. So follow along, and watch how exterior body features were gradually absorbed into a unified whole. And learn why car bodies rapidly evolved for 50 years—then stopped.

BY TOM TORTORICI



Innovation often starts with what's familiar; Henry's 1903 Ford was just beginning to evolve from the horse buggies that had been around for centuries. **Many early autos** were closer to the size and shape of today's golf carts than today's cars. ▶



Despite the Depression, automobile evolution hit a growth spurt that produced the protective exterior shell and interior cocoon that we associate with modern cars. **Manufacturing innovations** opened up new styling possibilities that made car design a true art form.



When the factories started back up after WWII, cars were built lower and wider. With running boards no longer needed as a step, that real estate was absorbed for roomier cabin space. **The change** also re-imagined grilles as horizontal instead of vertical.



Attempts to combine sedan comfort and style with SUV utility led to the minivan, then the crossover. **With hood, windshield and roof** merging for an egg-like form factor, personal cars have mutated far from the gangly assembly of parts they started as. *No one back then could foresee how cars would evolve—and neither can we.*



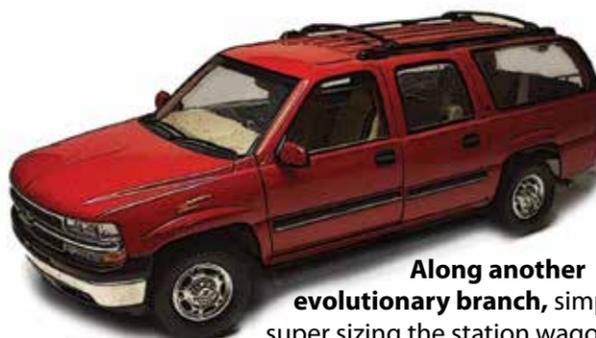
The engine soon migrated from under the seat to the front, under a small metal hood to reduce noise. This popular innovation made cars longer. **As with horse carriages,** seats were still perched high up, though drivers no longer needed to see over the tops of horses.



This 1937 Lincoln appears to be the missing link between the old carriage-inspired lineage (*right*), and the unibody look that defined autos forever more (*left*). **Fenders, headlights and the 'trunk'** are now integrated into the body, rather than being bolted-on accessories.



In a fashionable variation, the roof was lopped off for an open riding experience reminiscent of the first cars. **The V-shaped hood** and rounded front fenders were also remnants of earlier autos – soon to be fused together as a unified front end (*right*).



Along another evolutionary branch, simply super sizing the station wagon concept bred the SUV. **This car/truck mix** suited road-warrior suburban families with lots of stuff, and began to redefine the idea of a *family car*.



In a key evolutionary step after 1910, seats that had been sitting on *top* of the body were lowered *into* the body. **Riders were** at least partially protected from the elements, with enclosing walls (originally wood) and a windshield (that folded down when it got too dirty).



By the '30s, the hood had widened to merge with the rest of the body, sporting stylishly smooth lines known as the *torpedo* look. **For cargo space,** an ordinary traveling trunk is mounted on a platform in the back – an area that will always be known as the *trunk*.



Extending the interior to the back bumper offered extra space for trips with kids in the '50s. **At this point** in car history, though, an interesting thing happened. Auto bodies, having matured to a classic form that perfectly fit a mobile society, essentially *stopped evolving*.



Since then, cars have become more streamlined for fuel efficiency. Styling has sure changed. But today's sedans still retain the same layout and proportions as sedans from the mid-1950s. **Those shiny** chrome bumpers didn't survive, however, as they too got swallowed into the body.

**We drive here, we drive there.
We take our easy mobility for granted.
And forget just how lucky we are.**



FRESH PERSPECTIVES ON CAR OWNERSHIP

BY TOM TORTORICI

Peeved that your car doesn't have enough cup holders? Let's look back at what people in the past had to endure to get from here to there. You may be surprised how many *still* get by without the self-propelled miracles that our time, place, and means entitle us to.



You're cruising along in the fast lane, reclining in comfort, surrounded by music. GPS points the way, as LEDs light up the night. You're warm and dry, despite the freezing sleet. Personal travel has *not* always been this easy.

Freedom's just another word for... having your own car.

Imagine if a modern SUV suddenly showed up in ancient Greece, inviting locals to climb in for a speedy, air-conditioned ride home. Could they even wrap their heads around the experience?

For the first sixty years of automobile ownership, people went for Sunday rides, thrilled with the power to simply sail through the countryside.

When's the last time you backed out of the garage with no destination or mission in mind?

The thing is, once we manage to outrun the traffic, our well-worn routes, and our mental chatter, driving is actually *fun*.

Sometimes it takes a curvy two-lane road on a sunny spring day to appreciate what we possess.

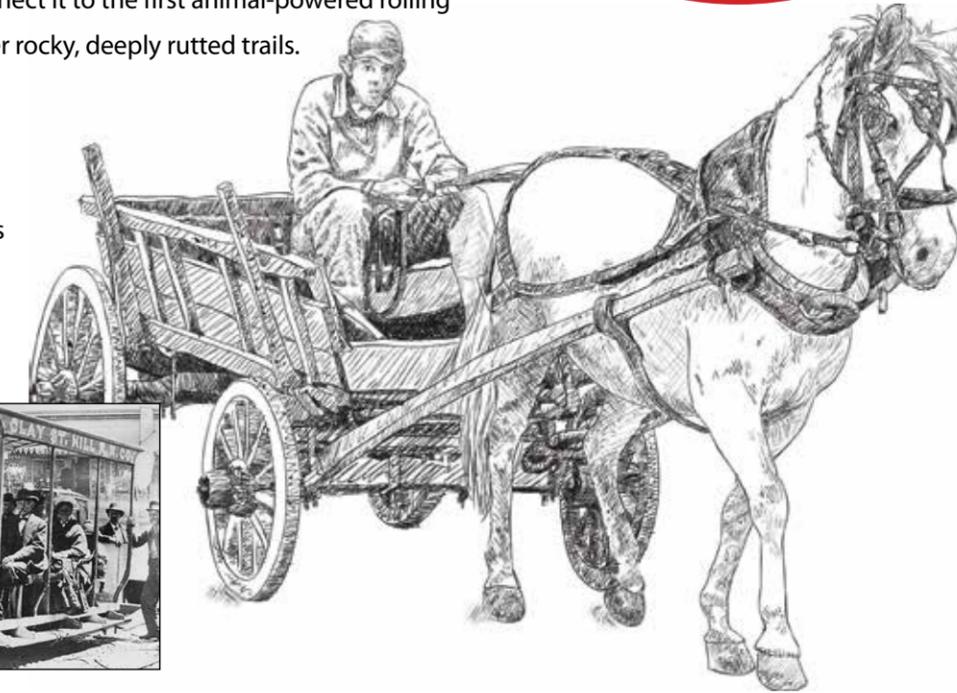
Because in our cozy sealed cocoon and protective outer shell, there's no territory we fear to tread.

The taming of the beasts.

Humans were riding horses, camels, donkeys and other 4-leggers by 3000 BCE, finally giving our feet some relief. We trained the creatures not to throw us off, and trained ourselves not to fall off. The wheel had been invented, but was useless until early entrepreneurs devised the *axle* to connect it to the first animal-powered rolling carts. Rides were bone-shaking though, over rocky, deeply rutted trails.

Sorry, the train just left.

Great Britain pioneered motorized transport in the 1800s, with public railroads and steam-powered buses. San Francisco followed with electric streetcars for commuters. These conveyances reliably got you there, but only if you adapted to *their* routes and schedules. And as far as getting to and from the station, you were on your own.



Out of about 7.5 billion in the globe there are only about 1 billion car owners.

The always-ready, go-anywhere machines.

In U.S., car ownership gained traction in the 1920s for the lucky, growing middle class here. In Europe, though, personal motor vehicles were mainly reserved for the elite until the early 1950s, when car ownership worldwide skyrocketed. A one-car garage was originally sufficient, until everyone in the family over 16 demanded a set of wheels to head out in their own direction.



Automobile addiction.

Sure, city dwellers all over the world today get around perfectly fine with public transport and yes, walking. But the rest of us get the heebie-jeebies when stranded for a day with our car in the shop.

Our past is their present.

From the vast deserts of North Africa to the isolated mountains of China, animals are still the engines of daily mobility for many. People here don't even dare aspire to a new Jeep Cherokee, though they might covet a more modest upgrade...



Everybody just pile on.

In plenty of other places, folks take advantage of transportation technology, but with a motorbike as a perfectly acceptable family car. From the primitive to the privileged, whatever we're born into, apparently, we consider 'normal.'



FOR 200,000 YEARS, WE WALKED EVERYWHERE (SLOW & TIRING)



FOR 5,000 YEARS, WE RODE CARTS AND ANIMALS (SLOW & SMELLY)



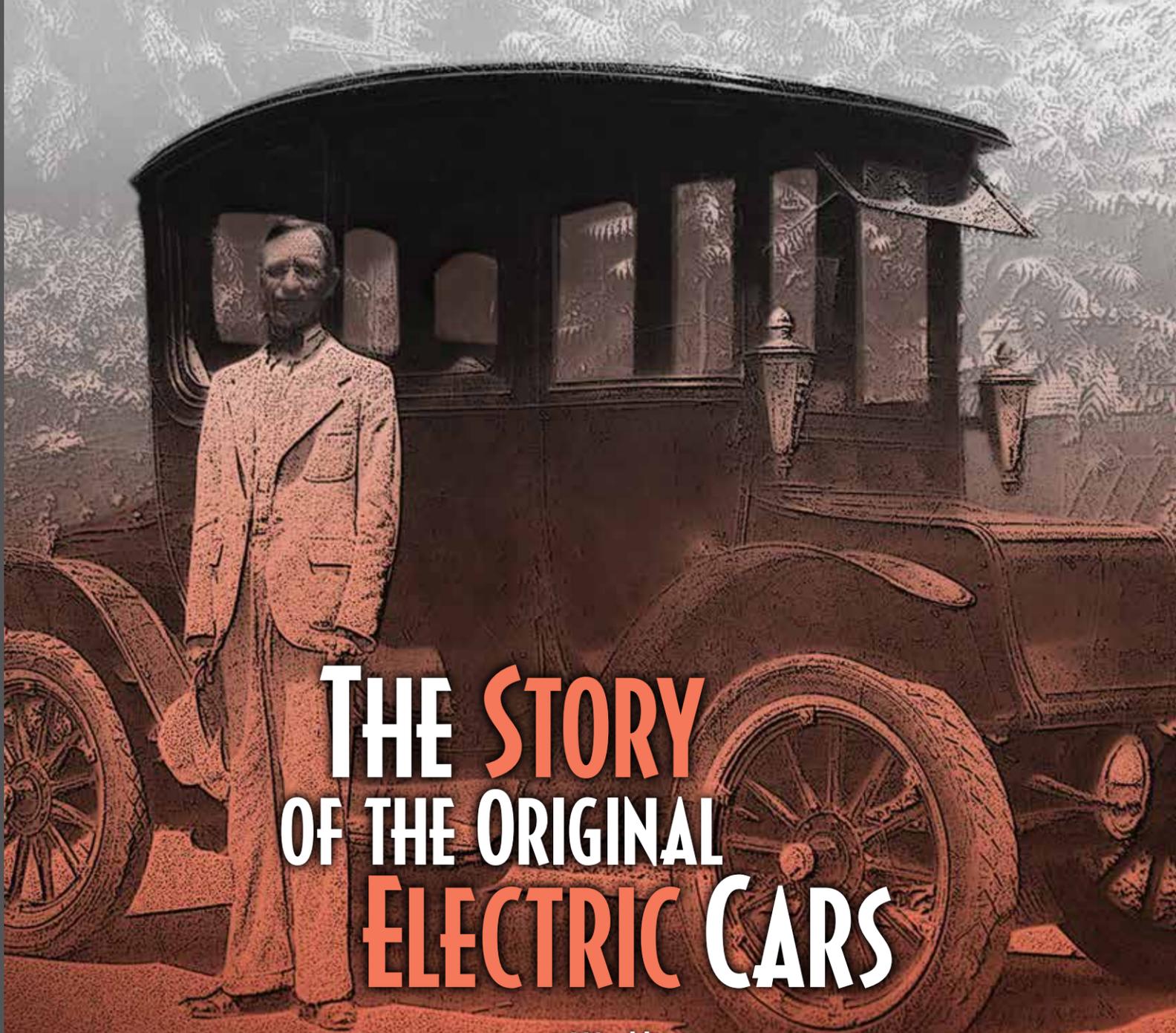
FOR JUST 120 YEARS, (THAT LAST TINY SLIVER) WE'VE ZIPPED AROUND IN OUR PERSONAL TRANSPORT PODS



Let's walk there.

For almost all of human history, foot power was our only travel option. Before agriculture, nomadic clans had to walk far over steep terrain to find what they needed to survive. Once they gobbled up an area's resources, they went back to the slog, hauling kids and possessions, shoeless, in the most extreme weather conditions.





THE STORY OF THE ORIGINAL ELECTRIC CARS



BY TOM TORTORICI

Well over a century ago, battery-powered autos weren't just functional transportation. They were status symbols among early-adopter social elites. How did they get there, and why didn't they last? Those innovative machines offer an insightful backstory for today's resurgence of electric-powered cruising.

THE RISE

It was a horse-and-buggy world when early entrepreneurs first bolted an electric motor onto a wheeled cart.

Those electric car prototypes only covered a mile or two at 4 mph before needing new batteries. Not impressive, but the idea worked.

The invention of lead-acid rechargeable batteries in 1859 made electric vehicles a lot more practical. One of the first commercially produced EVs were the 1896 Electrobat. These could go an exhilarating 20 mph for 25 miles, hauling 1600 pounds of power storage.

Electrobat sold the first electric taxis to New York and other cities to compete with horse-drawn cabs. As with those old-school versions, the rider stayed cozy while the driver sat exposed to freezing rain and broiling sun.

In 1908, Denver electrical engineer Oliver Fritchle upped the ante by building cars he claimed had a 100-mile range. For publicity, he drove from Lincoln, Nebraska to New York over unpaved and barely-there roads, with overnight charging at electric central stations. A trip that now takes 20 hours took him 20 days.

Though popular, electrics weren't the only game in town. The fortunate few who could afford to upgrade from horse to horseless carriage could also opt for steam-driven and gas-driven automobile technologies.

Steamers were strong competitors. But some families got antsy waiting a half hour for enough steam to get moving.



Early electric vehicles evolved into a handy variety of body styles, including trucks.



Electric taxi in New York City, c1910.

Previous page: Ambitious electric car maker Oliver Fritchle with one of his posh sedans.

Gasoline-powered cars at the time came in at last place, marred by noisy engines, teeth-rattling vibration, and plumes of smelly, oily exhaust. They were also hard to drive, requiring skill and concentration just to change gears.

Early electric cars had a competitive edge in cities, where their limited range wasn't as much of an issue. Plus there was less social resistance to cars that ran quiet, didn't pollute, and didn't scare the horses like those shuddering gas-powered autos.

Though with its own stinky form of pollution, horse transport was on its way out.

Selling such a high-ticket product, EV builders naturally tried to appeal to wealthier car buyers. One advertiser pointed out that "Every member of your family can drive it – no chauffeur needed."

Those companies especially targeted ladies of a certain class, promoting their cars' ease of operation and smooth ride. This approach was so successful that they later had to wrangle with the perception of electrics as 'women's cars.'

THE FALL

Ironically, it was electricity that helped gas-driven cars overcome a negative – and reclaim the female market. The push-button *electric starter* first appeared in the 1912 Cadillacs. This relieved wives from the unladylike effort of heaving the front crank to start the engine.

As more paved roads were built, folks were tempted to take longer trips.

And that development put electrics at a disadvantage. Carrying extra cans of gas was easy; carrying extra batteries was not. And with the discovery of Texas crude oil, cheap gas became available at the filling stations popping up on every corner.

There were also some electric-charging stations, but mostly in affluent shopping districts. The bigger problem was the half a century it took for electric service itself to spread from the city to the country. An EV wasn't much use to you until your home was on the grid.

Mr. Ransom Olds was one of the hopeful early experimenters with battery-powered mobility. But when he couldn't resolve cost and dependability issues, he turned to gas motors. Success came in 1901 with Oldsmobile runabouts so beloved, a popular song was written about them.

Henry Ford also gave up on his early EV efforts before turning to internal combustion engines.

But it was Henry's mass-produced Model T that really sounded the death knell for electric cars. It originally cost \$825 in 1909, half the price of comparable battery-powered autos. By 1924, those iconic Fords went below \$300, *one tenth* the price of many of that year's electrics.

Gas-powered car companies innovated, improved, and increased their options. Electric and steam vehicle builders just couldn't compete, even among the rich. By 1930, they had either switched to gas or shuttered their showrooms.

Internal combustion engines had won the technology race. And no one even thought about electric automobiles anymore.

THE RESURGENCE

To the surprise of many, General Motors in 1996 decided to pick up electric car technology and start moving it forward, with its pioneering EV1.



Since then, sustainability issues and the environmental impact of burning petroleum have only grown more critical. An eye on the future is driving improvements in electric vehicle range, cost and recharging. What next-gen innovations will smart people conjure up?

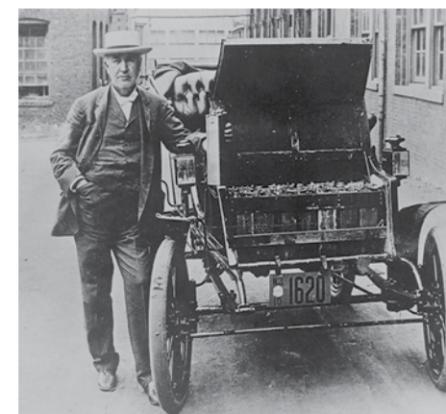
A mobile technology once abandoned by history may yet become the only way to run our errands. An upgraded revival of horse buggies, though, appears much less likely.



Gas, steam and electric powered cars competed side by side at the nation's first major auto show in 1900.



Car builders advertised how easy it was for ladies to recharge their very own electric car.



Thomas Edison with his personal Baker electric car, showing off the nickel-iron batteries he designed.

Early electric cars had a competitive edge in cities. They ran quiet, didn't pollute, and didn't scare the horses like those shuddering gas-powered autos.



**WHEN THE
RULES OF
THE ROAD
WERE WRITTEN**

BY TOM TORTORICI

The first autos didn't have to follow traffic laws, because there weren't any yet. But soon, chaotic traffic jams, erratic speeders, and mowed-down pedestrians made cars the new urban menace. Something had to be done, but what?



Chaos on every corner. Imagine every busy intersection as an automotive free-for-all, with no agreement – only constant quarrels – over who has the right-of-way. Welcome to the early days of motoring.

The first traffic cops only added to the yelling and confusion, pointing and waving in a frantic ad-hoc effort to keep the traffic moving. It hadn't occurred to anyone yet to let the north-south lanes proceed while holding back the east-west lanes, then switching.

Stop and go. The alternating method finally caught on, along with the idea in 1914 of using different colored electric lights to signal drivers whether to stop or go. However those lights didn't cycle by themselves; they had to be manually switched back and forth all day by a presumably bored officer of the law.

The tallest officers were assigned to the traffic beat in order to see over the tops of cars, trucks and trolleys. When that didn't work, cops were stationed in tall traffic towers in some cities, where they could see, and coordinate with, adjacent intersections.

Houston boasted the first street-corner traffic lights with automated switching in 1922. Soon, just about every town in America installed at least one traffic light, whether they needed it or not, as a status symbol of civic progress and importance. White-gloved officers, with their shrill whistles, mostly faded away as the standard unit of traffic control.

There oughta be a law. For a few decades, automobiles and horse carriages shared the road, with the former nimbly weaving in and out among the latter. There were, after all, no lanes. Drunks and kids had as much right to drive as anyone else. New Yorkers crossing the street to the ice cream parlor risked being added to the *Times'* daily tally of run-over pedestrians.

These were new problems, so no one had any experience solving them. Early efforts at rulemaking resulted in a spotty patchwork of laws that varied from one place to the next. Signal lights meant different things in different cities, so each approaching driver might think they had the right of way...just before the crash.

Getting traffic under control. Finally, a sharp New Yorker named William Eno observed, and pondered, and published his *Rules of the Road* as a guide for standard driver behavior. His clever effort eventually became the foundation for the traffic laws in many cities.

Though traffic control was a complex problem, authorities realized they had to keep the rules simple and intuitive. The process took some trial and error, to calibrate for the limitations of human cognition and response time.

Right-of-way rules evolved, which basically came down to two principles: First, every vehicle has a right to a 'safety zone' immediately surrounding it. And second, drivers making a change must yield to those simply proceeding forward.

With consistently followed rules, drivers could predict the likely behavior of other vehicles, and proceed accordingly. This discovery turned out to be key.

Hey, slow down. Connecticut was the first state, in 1901, to impose a speed limit to try to stem the epidemic of road collisions: 12mph on city streets, and 15mph on country roads. Some citizens pushed back, though, as if being told how fast to drive was somehow an affront to the American spirit.

Laws naturally are meaningless unless they're backed up with the threat of punishment. Night courts popped up to handle traffic infractions, imposing fines that were paid with simmering resentment. The worst punishment for a driver was not the electric chair, but even more bitter, the loss of their license.

One for the road. The first drunk driving law was passed in 1910, but included no standard of intoxication. By the '30s, road patrols were making suspect drivers blow into a balloon. The new Drunkometer device displayed a color to show their level of inebriation.

As more excited new drivers took to the roads, the National Safety Council promoted public awareness that climbing behind the wheel implied a social and legal responsibility.

License and registration, please. As with other regulations, some states were slower to start issuing driver's licenses than others. In fact, South Dakota didn't license drivers until 1954. And despite all the clearly incompetent drivers, many states didn't impose the indignity of a driving test. People who actually learned to drive often received their instruction from the salesman who sold them their car.

New York was the first state to register automobiles, with a fee based on the car's horsepower. They issued no tags, however, expecting the driver to craft their own, usually using house numbers. When states did start distributing steel tags, they came in all shapes and sizes, not standardizing to the current size until 1956.

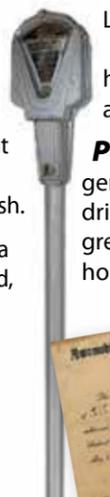
Give me a sign. First-time car owners were setting out all over America – and promptly getting lost. The first directional signs were planted not by local governments, but by drivers' clubs. Eventually, a highway numbering system, used on signs and maps, helped motorists navigate long trips with more than just guesswork.

The first stop sign, black-on-white, showed up in 1915 in Detroit. Standard shapes for each type of sign were soon set, since people could recognize the octagon before they were close enough to read the word.

Park it right here. More cars driving on Main Street meant more cars parking on Main Street. The first Park-O-Meters were installed in Oklahoma City in 1935 to discourage all-day parking in front of local stores. Aghast citizens showed up to protest, only after dropping in their nickel, since there was no place else to park.

Local governments soon became addicted to the revenue from parking meters, as well as from fines for all kinds of infractions. Counties with busy through-roads hid their black-and-whites at strategic spots. Why? To trap out-of-towners singing along with the radio who hadn't noticed the speed limit sign.

Policing ourselves. Since there couldn't be a watchful cop on every corner, a general agreement on street rules had to become psychologically internalized by drivers. To this day, we're still conditioned like mice in a lab to stop at red and go on green, when nothing is preventing us from doing the opposite – except maybe the honking wrath of the other mice. ●



What a Concept!

These quirky/cool old concept cars never got to cruise down Main Street.

But they did leave a legacy of innovations that pointed the way forward to today's production cars. Plus the visionaries who conjured up these prototypes got to have some creative fun.

BY TOM TORTORICI
Images: Michael Furman, Silodrome, Henry Ford Museum

QUIRKIER

1933 Dymaxion ▼

Prolific inventor/designer Buckminster Fuller imagined an all-in-one vehicle that could drive, float, and fly – *when* the technology became available. With its rear-wheel steering and whale-like form, though, it was a clumsy beast on the road. **Legacy Features:** Fuel-efficiency technology; human-centric design.



1969 Toyota EX-II ◀

This 3-wheel, 2-seat electric runabout was designed for cheap commuting. Just lift the bubble canopy from the front and climb on in. **Legacy Features:** 100% electric powered; single-curve profile.



1932 Stout Scarab ►

Apparently an early ancestor of the minivan. At the time, people couldn't decide if it was an art deco masterpiece, or just plain ugly. **Legacy Features:** Unibody construction; independent suspension; reconfigurable seating.



COOLER

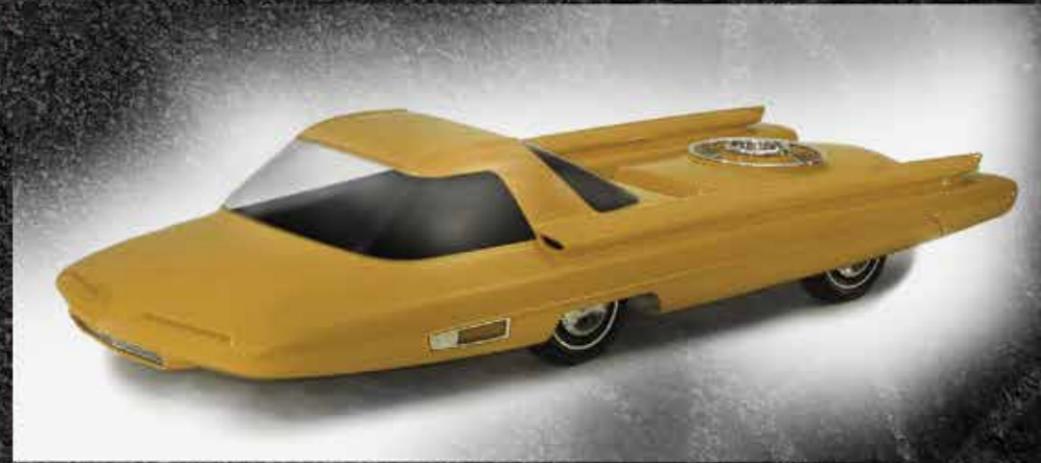
1955 Chrysler Ghia Streamline X ►

With a gas turbine and an aerodynamic body that countered crosswind resistance, this Italian-designed vision could have zoomed you to the mall at 160mph. **Legacy Features:** Light aluminum body panels; advanced streamlining.



1958 Ford Nucleon ◀

In an audacious plan, this concept car would have been powered by a small on-board nuclear reactor. 5000 miles without refueling! **Legacy Features:** Torque converter; adjustable modes for sports or economy driving.



1958 GM Firebird III ▲

No relation to Pontiac's pony car, this one was jet-powered, offering a jet-pilot experience. Its *wings* inspired Cadillac's *fins*. **Legacy Features:** Anti-lock brakes; cruise control; keyless remote door opener; collision-avoidance system.



1955 Lincoln Futura ▲

Swimming sharks inspired its design. A decade later, it was customized to morph into TV's original Batmobile – with a rear 'rocket booster' made from a 5-gallon paint can. **Legacy Features:** Center console; door-ajar warning.



1939 Phantom Corsair ▲

This sleek beauty was created by Rust Heinz, who preferred designing cars to helping out at his family ketchup business. **Legacy Features:** Hydraulic impact bumpers; interior crash padding; climate control system.



Think you know a lot about cars?

by Tom Tortorici

Here are some highlights (and lowlights) of early automobile history that may surprise you.

Drive back where you came from

A horse-drawn world in 1900 surely must have welcomed the zippy new age of the automobile, right? Apparently not everyone was quite so enthusiastic. Well-to-do families in the early years would set out on weekend car trips into the countryside, only to find rocks and bricks hurled at them by the locals! Cars in those days were loud, oily-smelling beasts that kicked up clouds of dust from the dry dirt roads. Apparently these intrusions of progress jarred the traditional sensibilities of rural folk. Worst of all, the odd, jerking machines scared the horses, who would sometimes careen off the road, carrying their carts and riders on an unexpectedly wild ride.

Look at me while you're driving

The front seat/back seat arrangement seems to make perfect sense for cars, but in the early days, it appears to have taken a while to arrive at that configuration. The French 1890 Panhard-Levassor had a back seat all right, but it faced backward. In a presumable response to the difficulties of group conversation, cars like the 1896 Peugeot had its back passenger seat placed in *front* of the driver's seat, in a

'vis-a-vis' or face-to-face arrangement. Finally realizing that the driver's ability to see the road trumped conversational courtesy, passengers soon got moved back to the back, but at least now they could see where they were going instead of where they'd been.

Traveling to exciting new counties

Once back-country Americans got past their early, somewhat violent resentment, and as they noticed car prices dropping, they started to pick up on the possibilities. Now, with one of these newfangled contraptions, carrying their crops to market every week took half an hour instead of half a day. They could visit relatives in other towns who they otherwise might never see again. And, significantly, they had access for the first time to big-town medical care, education, libraries, media, sports and culture, as well as retailers hawking the latest consumer conveniences. In this way, the automobile probably had more overall impact on the lives of farm people than anyone else. Plus Henry Ford made sure that his Model T's engine could be adapted to run farm machinery. Not a big selling point today, but it certainly was at the time.



The engine must be here somewhere

In the earliest cars, the motor was generally mounted under and behind the driver's seat, near the real wheels that it powered. During the first decade of the 1900s, some car makers experimented with engines in the front, under a metal hood, a stylish modification that soon won popularity. Problem was, other manufacturers still hadn't figured out how to drive the rear wheels from a front-mounted engine. For example, the 1905 Yale Model E still kept its engine hidden low in the back, but to attract fashion-conscious buyers, it featured a *fake* hood in the front that held...nothing (except for maybe the water and oil tanks). Eventually, all automobile companies employed the engine-forward configuration, which allowed the entire car to sit lower to the ground. After all, unlike the carriages they had evolved from, cars no longer had to be built to allow the driver to see over the tops of horses.

Two dollars regular, please

The first gasoline providers for early cars were existing establishments like hardware stores. However since the pumps were simply placed in front of the store at the curb, cars that were gassing up tended to block the road. In busy areas, that led to continual traffic back-ups, driver rage, and more than a few accidents. When pumps were finally set back as part of proper 'service stations,' the accompanying structures initially tended to be cheap wood or corrugated metal sheds, creating dilapidated eyesores all along the road. This soon became a serious social, political and aesthetic issue. *Then* things swung the other way, with stations trying to outdo each other to gain architectural respectability. One gasoline company built their service stations to look like quaint English cottages, and another offered buildings that looked like Greek monuments, complete with classical columns.

Meet your car's great-granddaddy

America's first gas-powered vehicle may have been a remarkable technological leap in 1895. But it looked like what it was: a humble 2-seater horse buggy. It had been purchased, used, by the entrepreneurial Duryea brothers in Springfield, Mass. Peeking under this particular buggy, though, would reveal a one-cylinder internal combustion engine, bolted on and hooked up to propel two bicycle-like chain drives. At the first street test, curious onlookers gathered. After an initial human-powered push, the chugging 4HP motor sputtered to life and nudged the buggy along for 200 feet. At that point, a large bump in the road proved enough to entirely thwart its momentum. Still, Charles and Frank Duryea scored it as a win. Tweaks and tests continued, yielding an upgraded, slightly more purpose-built 2-cylinder model for the fledgling Duryea Motor Wagon Company to put into production. But even adventurous buyers were put off by the \$1000+ sticker price. Then the brothers

started quarrelling over who got credit for what, and soon let their differences get the best of them. Still, the modest run of 13 hand-built cars nonetheless marked the establishment of the American automobile manufacturing industry.

Women's Right of Way

In the earliest days of the twentieth century, motoring was a man's world. Throughout the late teens and the twenties, though, the lady of the house increasingly found that 'a woman's place' was behind a steering wheel. Three developments helped move this trend along. First, the option of an electric ignition freed the fairer sex from having to crank up the car from the handle in the front, a difficult and often dangerous procedure even for men. Second, cars became more reliable, which made it less likely for a young wife to be stranded on the road. And third, hardtop models began to outsell convertibles, protecting ladies and their children from questionable neighborhoods and unpredictable weather. The sense of freedom and empowerment that females gained by their new mobility surely was a factor in the growing women's rights movement at the time.

And we have a winner

At the turn of the twentieth century, electric cars, steam-driven cars, and gasoline-powered cars all competed for market share, and it was far from certain at that point which would prevail. Electric cars, like even today's models, were limited in range, and apparently that was a deal-killer for new owners who might want to jump in and drive to the horizon. Steam cars were powerful enough to cover longer distances, but waiting up to a half hour to get enough steam up was ultimately too tiresome for on-the-go drivers. Early internal combustion engines may have made for a smoky, noisy, vibrating ride, but ultimately they won the newly-mobile hearts of car buyers by default. The fact that they start right up and ride forever made gasoline-fueled cars the driver's exclusive choice for the next hundred years.

Obstacles to Progress

Beginning in the 1880s, France and Germany made great, rapid strides in developing and popularizing the self-propelled vehicle. England? Not so much. Steam carriages were actually quite successful as public buses in the later part of the nineteenth century. But their competitors, the railroad and horse-carriage industries, had better lobbyists; Parliament was persuaded to levy a tax on the steamers so burdensome it put them out of business. A few years later, British officials were so fearful of the response to personal gas-driven vehicles on public streets, they ruled that every automobile must be preceded by a man on foot, waving a red flag to warn villagers of the 4-wheeled monster coming down the road.

A History of Automotive Amenities

Think your commute is tough? Try it without the comfortable conveniences that have evolved over the years.

1912 First Electric Starter

Starting early automobiles from the crank in front wasn't just strenuous. It was dangerous.

A Detroit gentleman who stopped to help a female motorist in 1910 was killed when the crank violently kicked back. His friend happened to be Henry Leland, head of the Cadillac Motor Car Company. Shaken, Leland told engineer Charles F. Kettering that if Kettering could develop a self-starting device for cars, it would be used in the following year's Caddys.

However, a small electric motor with the required voltage to turn a heavy engine would burn out in minutes. But Kettering developed a motor that could put out large bursts of power for just a few seconds.

One day, Kettering offered to pick up Thomas J. Watson, later head of IBM, at the train station. As they got in the car, Watson peered at his friend who apparently had forgotten to crank the car up. Then his mouth fell open when the engine came to life at the push of a button.

It worked, and Leland kept his word. Suddenly, guys standing out in the rain heaving the engine crank seemed quite unfashionable, and by 1920, electric push-button starters were the norm.



1914 First Turn Signals

Unlike impolite drivers today, people before 1914 had an excuse for not using their turn signals: they didn't exist.

That year, silent movie starlet (and automobile enthusiast) Florence Lawrence decided that we should know each other's navigational intentions. She developed a mechanism called an Auto Signalling Arm: buttons on the dashboard would lower a single pointer on the back of the car to either the left or the right. She also invented a "stopping" sign which automatically swiveled upward when the footbrake was pressed.



It wasn't until 1938 that Buick introduced the first electric turn signals. But since it didn't seem to occur to some people to turn off the signal after the turn, the 1940 model came with a self-cancelling mechanism.

Of course, people could always use hand signals to indicate intended turns and stops. Problem was, you couldn't see that hand at night. Which led to something called the *Illuminated Glove*, which in 1918 was a reflective mitt for the left hand. Today, it's standard equipment for nocturnal bicyclists.

1927 First Car Radio

Even to people rushing home to catch their favorite radio show, the very notion of a radio in the car once seemed like a silly and far-fetched idea.

But not for long. The earliest mobile radios were home-brew affairs, crudely adapted from household radios. Then in 1927, Philco released its *Transitone* as an after-market item. But the electrical systems in cars created static that competed aggressively with the music.

In 1930, the Galvin Manufacturing Company introduced two things: the first truly practical car radio, and their new company name, Motorola. Too broke to afford a booth at an Atlantic City trade show, Paul Galvin parked his Studebaker outside the hall, cranking up the volume so passing conventioners could hear it. His plan worked — he received enough orders to put his radio into production.

By 1933, Ford was installing radios at the factory. The idea had caught on, satisfying the growing hunger for constant entertainment, and forever freeing riders from the chore of ongoing conversation during long trips.



What were once luxuries are now necessities...

1929 First Car Heater

In the early days of winter motoring, car heating meant heavy coats, scarves and lap blankets. Since most cars were open to the elements, the chilling wind still made for a miserable ride.

As more enclosed cars were sold, people started using portable gas lamps and burners for warmth, as they had for centuries with horse carriages. But these were inherently dangerous.

By 1917, engineers realized that exhaust fumes could be circulated around the cabin in pipes, to offer faint warmth. The first real heaters appeared in the 1929 Ford Model A, using heat from the engine. But people



complained that the system didn't fully heat up until they were a block away from their destination. The following year, GM came out with the now-standard heating core, with fan-powered circulation. From then on, we've stayed toasty, more or less, during winter holiday trips to grandma's.

Except for truck drivers, who waited much longer for effective heating systems to become standard. Apparently, even Northern trucking companies felt that cabin heaters were a frivolous luxury that would only eat into their profits.

1951 First Power Steering

Before power steering, maneuvering a car around city streets was the equivalent of a stiff workout. But that was nothing compared to tooling around in an eight-ton armored car during World War II.

Engineer Francis Davis at Pierce Arrow actually demonstrated the first hydraulic power steering system way back in 1926. Later, as a GM employee, he was disappointed when the bean-counters there deemed it too expensive to produce. But when Davis signed up with parts manufacturer Bendix, his design eventually found its place in wartime battle vehicles.

Finally ready for prime time, *Hydraguide* power steering was featured on the 1951 Chrysler Imperial. Autos of that time were big, bulky and almost as weighty as their military cousins, and folks didn't want to work up a visible sweat on their way to church.



But since the design was based on expired patents, Davis didn't get a penny. However he did get the last laugh, eventually ending up back at GM, with a chunk of change for every power-steered car that rolled off the assembly line.

By Tom Tortorici

Tom writes about the social and cultural aspects of car history.



1953 First Air Conditioning

A long ride during a Southern summer used to feel like a pizza oven with a steering wheel. People got so overheated and cranky that a smiling couple on their honeymoon trip soon found their budding marriage put to a scowling, seething test.

An early version of automobile air conditioning had been first tried in the early '40s. But the noisy units in the old Packards took up half the trunk, and had a price tag that was more impressive than their cooling power.

The first air conditioning as we know it was the *Airtemp* option on the ever-innovative Chrysler Imperial. Not only was it silently refreshing, but it cleared the air from four adults exhaling smoke rings from their Chesterfields.



By 1960, 20% of U.S. cars buyers were springing for the extra cost of A.C., which bumped up resale value. In the hot, dry Southwest though, the figure was 80%, presumably with a more immediate benefit in mind.

First Speedometer

1901 Oldsmobile Runabout



First Power Windows

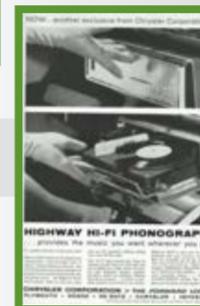
1940 Packard 180

First Seat Belts

1949 Nash

First Dashboard Phonograph (!)

1956 Chrysler



First Intermittent Windshield Wipers

1969 Ford Mercury

First Antilock Brakes

1978 Mercedes Benz



First GPS Navigation

1993 Oldsmobile 88

First Remote Control Key Fob

1993 Chevrolet Corvette





The Drive to Compete:

Forgotten Heroes of Racing History

The First American Racer

Frank Duryea



The bustling spectators don't notice the light snow falling on their shoulders. Riveted with curiosity and anticipation, they stare at the six noisy, shuddering cars at the starting line. It's Thanksgiving Day, 1895 in Chicago's Jackson Park, and the first automobile race in America is about to start.

The first gangly vehicle to gain momentum—hardly at breakneck speed—is driven by a hopeful Frank Duryea of Springfield Massachusetts. Two years ago, Frank and his brother landed themselves a place in the history books by building the first gas-powered car in the U.S. It was actually a second-hand horse carriage they had outfitted with a recently-invented internal combustion engine, and a bicycle-like chain drive.

The machine that Duryea is steering through the park today is an improved, relatively souped-up model that doubles the number of cylinders from one to two. A race Umpire sits beside him to keep things on the up and up.

Already behind Duryea are the other entrants, three gas-powered Benz machines from Germany, and two electric cars. Early carmakers see today's popular event as a exciting chance to showcase their vehicles and prove their endurance. However the overnight snow has created rough conditions.

The race course has been charted along 27 miles of coastal parkland and public streets to Evanston, Illinois,



Frank Duryea, his Umpire, and his car at the 1895 Chicago race

followed by a return trip to Chicago. Since there's never been an organized automobile race before, no one is quite sure what to expect.

After a smooth start through the park's unpacked snow, trouble begins for Frank Duryea when he hits the bumpy, rutted city streets. His wagon-wheeled auto starts shaking alarmingly from side to side. Jolted by one of the more cavernous ruts, Duryea is distraught when the steering arm he uses for turning suddenly breaks off in his hand.

With no way to maneuver, the driver must head out on foot to find a local blacksmith. Then he watches impatiently while the iron steering arm is carefully re-forged and re-threaded...all while the 'race' remains in progress.

In fact, one of the Benz cars has taken advantage of the situation to chug into the lead.

Chilled but determined, Duryea manages to regain that lead at the race's half-way point. He also regains his confidence...until disaster strikes again.

Now one of the two cylinders stubbornly refuses to fire. Again, the racer somehow manages to find willing

assistance. An hour later, both cylinders are doing their job, and Frank Duryea and his Umpire are back underway.

Then, as Duryea later recalled, "after a stop for gasoline, and a four-minute wait for a passing train at a railroad crossing, we continued."

Under wintry gray clouds, with the chugga-chugga of the engine in his ears, the weary driver winds his way around horse carts plodding along icy roads.

With all the delays, Duryea quietly worries that other cars have made their way ahead of him. But now as the course takes him through a local park's untouched snow, it dawns on Duryea that his competitors must be behind him after all! Probably, he imagines, suffering mechanical woes of their own.

A grueling ten hours after he started, Duryea is thrilled to be the first to cross the finish line, cheered by the few remaining fans. Average speed? A big seven miles an hour—but enough to give pioneering automakers Frank and Charles Duryea bragging rights for the fastest car in America.

Along with making headlines across the country, they also win the race's \$2,000 prize, about \$50,000 in today's money. Not bad for a couple of innovative bicycle mechanics—the profession, incidentally, of another pair of brothers who are about to take to the skies.

Hours later, in darkness, one of the Benz automobiles finally nudges its own way across the finish line. Except it's being driven by the Umpire, with the original driver slumped in the passenger seat, collapsed of exhaustion. ●

America's First Lady of Racing

Louise Smith



The sights and sounds of the cars racing around the track made an instant impact on Louise Smith. It was the dusty summer of 1943, and it was her first time in the stands.

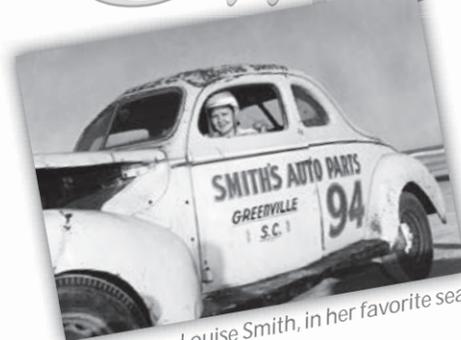
With her own heart racing in sync with the whining engines, she decided she couldn't simply sit there.

So on the spot, she climbed down and signed up for the next race, driving the car she had arrived in.

As she sped around the dirt track, Louise experienced the same thrill she had felt when outrunning the cops in her hometown of Barnesville, Georgia. Turns out she was in good company: a lot of the other drivers were sons of Southern bootleggers, who had also honed their racing skills being pursued by cherry-topped black-and-whites.

The Georgia girl proved she could compete with the good ol' boys by coming in third in that race. Problem was, she didn't know that a checkered flag signalled the end of the race, so she just kept running around the oval.

"They told me if I saw a red flag to stop," she said later. "They didn't say



Louise Smith, in her favorite seat

anything about a checkered flag."

Someone finally figured it out, and threw out the red flag. But by that time, Smith was smitten with racing fever.

Some time later, she asked her husband to borrow his new maroon Ford for a little vacation. She neglected to mention that her destination was Daytona Beach, Florida, where she entered the car in another race. This time, she wasn't as lucky; half way through, she managed to wreck the car in a pile-up.

On the bus ride home, she made up a lie about the car breaking down in Augusta. But when she tried it on her husband Noah, he pulled out a local newspaper that showed her wreck on the front page. Busted.

"I was just born to be wild," Smith told an interviewer years later. "I tried to be a nurse, a pilot and a beautician and

couldn't make it in any of them. But from the moment I hit the race track, it was exactly what I wanted."

Enter Bill France Sr., the owner of a local track in South Carolina. He had his eye out for a woman driver who might attract more females to his racing events. Someone told him about Louise Smith, who had already developed a bit of a reputation as a fearless racer. France first used Smith as a novelty act, but she again showed she could be a real competitor.

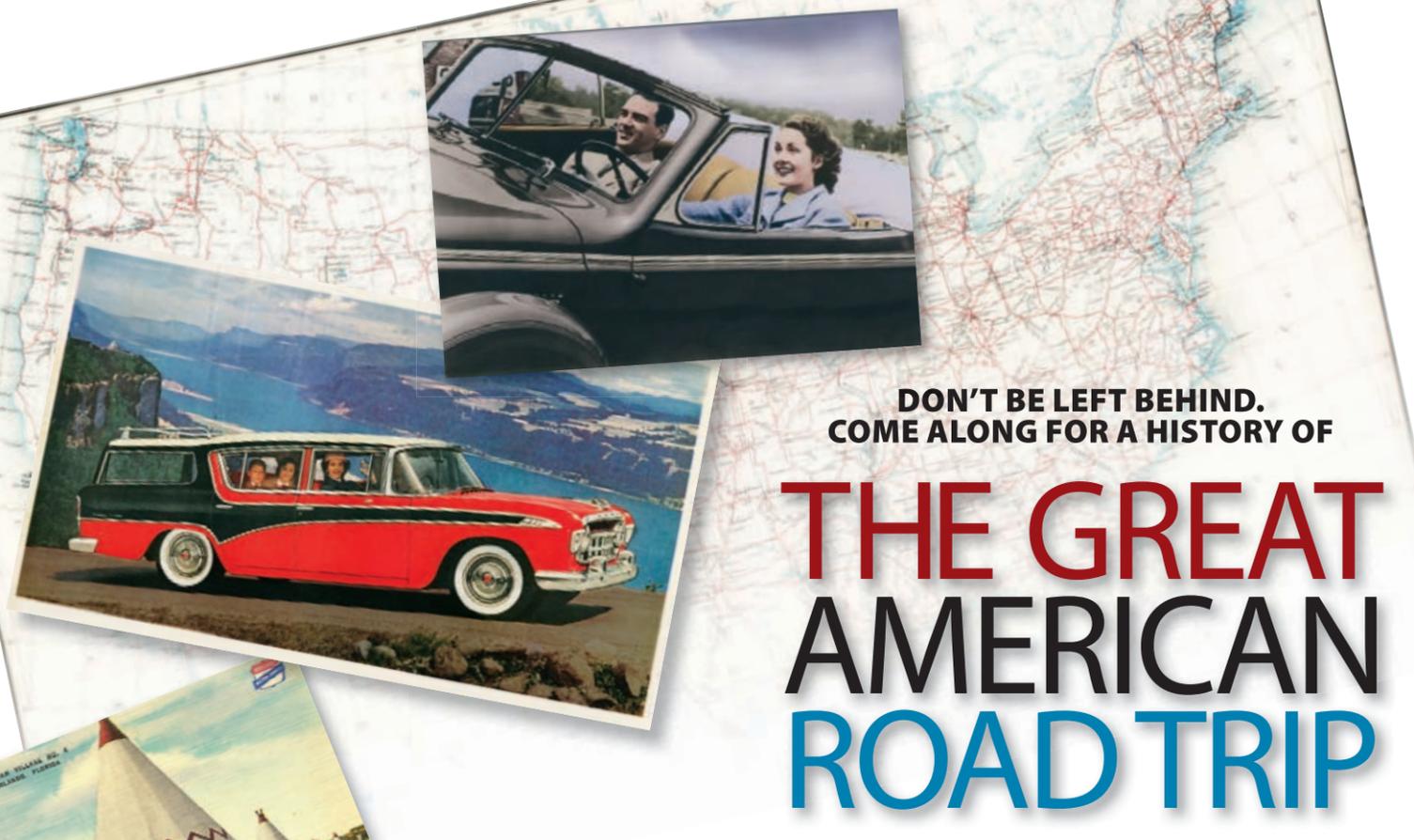
So when Bill France Sr. developed the NASCAR racing series, Louise helped to promote it as its first woman driver—even though "We didn't think [NASCAR] was going anywhere."

Being the lone female wasn't easy. "Them men were not liking it to start with, and they wouldn't give you an inch."

Yet throughout her career, Smith went on to win 38 times in Midgets, Modifieds and Sportsman cars.

She retired from racing in 1956. In 1999, Louise Smith became the first woman to be inducted into the International Motorsports Hall of Fame.

"I won a lot, crashed a lot, and broke just about every bone in my body," she said, "but I gave it everything I had." ●



**DON'T BE LEFT BEHIND.
COME ALONG FOR A HISTORY OF**

THE GREAT AMERICAN ROAD TRIP

Monday through Friday, your car is a commuting machine. For weekend rides to Target and Home Depot, it's a light duty truck. But when friends or family pile in at dawn to begin a vacation road trip, well, then your car turns into a magic carpet.

Before the automobile, there was no such thing as vacation travel — unless you were rich. Farm families never packed up the wagon for a week at a beach rental. But when car ownership rose after WWI, and in even greater numbers after WWII, dads could now load up the wife and kids, and drive, literally, to anywhere in the country (at least until 1959, when Hawaii became a state).

The Great American Road Trip. Sure, there were trains and ships for long journeys, but neither could compare with the sheer, limitless freedom of having your own personal vehicle. It was a rolling adventure, ready when you were, for any whim of a destination. Funny how we now take that easy mobility for granted, on a planet where, even today, most people would be thrilled to own even a motor scooter.

By Tom Tortorici

Tom is a web & marketing writer who's fascinated by the social history of the automobile. Reach him through TomTortorici.com.

Catching Road Trip Fever

The first coast-to-coast car journey was an ambitious undertaking in 1908 by two mechanics and a dog named Bud. It took them 63 days. Not to be outdone, a Miss Alice Ramsey and three gal pals made the journey a year later. Roads were mostly unpaved, shelter rare, and directional signs pretty much nonexistent. From muddy ruts to mountain snowbanks, the open road wasn't ready yet for the typical family.

That started turning around in the twenties when paved two-lane highways started criss-crossing the country. At the same time, car prices came down within the range of more — but by no means most — households. Even if you didn't have the cash, you could now borrow against the future and climb in behind the wheel. Suddenly, visiting faraway places you'd read about in magazines was no longer an idle fantasy.

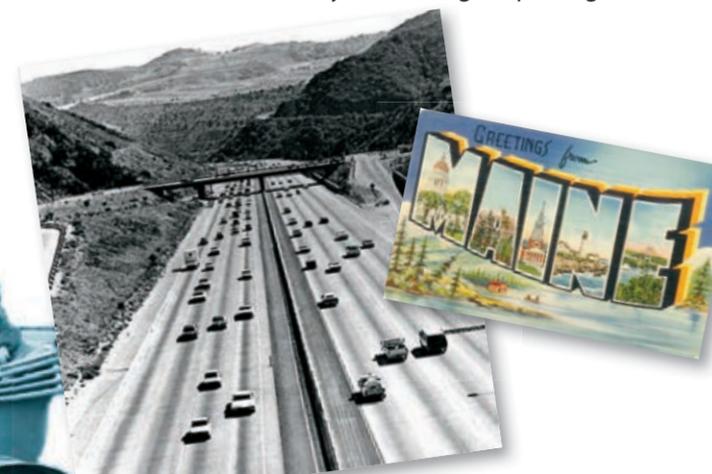
Most autos were still open to the elements, and tires blew out a lot. But it was a sweet perk for the growing American middle class, since in Europe at the time, car ownership was still mainly reserved for the elite.

What used to take days now takes hours.

With an internal combustion engine, air-filled rubber tires, and smooth roads, you could now blast through the U.S. countryside at what must have seemed like dizzying speeds. Four thousand years ago the Sumerians invented the first wheeled, horse-drawn vehicles. The average speed of 5 miles an hour for personal travel, finally, and almost all at once, increased tenfold.

Starting in the late '40s, more folks took to the road when companies started offering paid vacations. With an end to wartime gas rationing, overnight car journeys became an easy and cheap escape for growing families on a budget. In fact, the more bodies you squeezed into the station wagon, the more cost-effective it was.

Service stations even gave away maps for free, beckoning drivers with carefully marked routes to new horizons. Let's see...California? Why not? Let's gas up and go!



The Rise of Roadside America

As more vacation travelers passed each other on the way to new adventure, real estate along the roads became long ribbons of economic opportunity. The travelers' trinity of gas, food and lodging birthed local family businesses where every relative had a role. Countless signs and billboards alerted approaching tourists, with 'Clean Bathrooms' being among the most popular enticements.

Okay, let's start looking for a place to stay.

Campgrounds, the earliest option for overnight travelers, evolved into tourist camps, where honeymooners or college buddies could get a wooden cabin with a bare mattress for a dollar a night. These in turn evolved into proper 'cottage courts,' with homey touches like picket fences and window flowerboxes.

As demand increased, it was cheaper to build rooms that were connected side by side, around a central courtyard. This arrangement became known as the Motor Hotel, or Motel. In fierce competition with each other, these facilities would lure families with swing sets and swimming pools, plus radios (and of course later, TVs) in every room. Could life get any better? Actually it could: lay down on the vibrating Magic Fingers bed, 15 minutes of total relaxation for a quarter.

Since anything Western themed was all the rage, mom, pop and the little ones could even spend the night in a (concrete) Indian teepee at a 'Wigwam Village.' Send a postcard, the other kids at school will be sooo jealous.

Ma, I'm hungry.

Early road warriors had to stop sometime, usually at local diners and cafes. That is, until Howard Johnson perfected his clean, familiar formula for roadside dining. The McDonald brothers accommodated go-go-go travelers with the first drive-thru windows. And uniquely American 'Programmatic Architecture,' such as a hot dog stand in the shape of a giant hot dog, lured drivers with an irresistibly novel eating experience.

Sadly, black families before WWII had a much harder time finding rooms or restaurants on the road to accommodate them. Often they resigned themselves to eating, and sleeping, in their cars. In some parts of the South, even that wasn't safe.

[More Great American Road Trip >](#)



Rolling Out the Roads

By 1925, plans were in place to build a coast-to-coast highway system. This included a previously unpaved string of east-west roads that became the legendary Route 66. A new highway numbering system enabled people who weren't locals to find their way around.

The Great Depression was bad news for everything except roadbuilding. To keep as many Americans as possible employed, the Work Projects Administration funded a web of road construction. This included the modern miracle of crafting graded highways over, around, and through the mighty Rocky Mountains.

We're done. Now let's start over.

After the Second World War, American cars were being built lower and wider, which meant they didn't fit too well on those old narrow two-lane roads. Neither did a creative variety of travel campers. These started out as home-made wooden shacks on the back of pickups or flatbeds, and evolved into the relative luxury of those distinctive silver Airstream trailers.



Hence another major round of roadbuilding. The highlight was President Dwight Eisenhower's ambitious vision in 1956 for a modern, limited-access U.S. Interstate highway system. Paid for chiefly by fuel taxes, it's still considered the greatest public works project in U.S. history.

Unfortunately, the new Interstates in the '50s and '60s weren't good news for small towns that had once thrived on serving and entertaining passing tourists. As vacationers now sped by, trying to make good time on the Interstate, roadside souvenir stands and even entire Main Streets only a mile or two away now withered.

Attractions Worth the Drive

Natural resources like Florida's Weeki Wachee Spring dressed themselves up to take advantage of the growing vacation trade. Other roadside wonders were totally fabricated to provide unique, but safe, forms of adventure to tourists with ready cash.

At Dinosaur Park in Rapid City, South Dakota, you could confront a full-size Tyrannosaurus Rex without fear. And don't miss the old Cawston's Ostrich Farm in Pasadena. Or the Atomic Tunnel, a refurbished nuclear fallout shelter turned into an aquarium. Maybe you'd prefer instead to take in a gunfight at a old-west town on the east coast. Or dig for fossils in an ancient sea bed in upstate New York. And if the kids are still bored, there's always miniature golf.



Delighting travelers becomes serious business.

Some attractions blossomed into theme parks to compete as the travelers' final destination. Lush, Polynesian-themed Tiki Gardens offered an exotic experience in the Sunshine State. At Bible Land in California, you could stand in awe before sand sculptures of Biblical scenes. And who knows what you might find at Kentucky's Hillbilly Garden? Of course, things ramped up a few notches when Walt and his team of creative professionals unveiled Disneyland in '55 as the ultimate family vacation destination. How could you tell your kids 'no'?

What entire city's enormous success grew from its accessibility to Chevys and Fords? The Las Vegas 'Strip' was built in the middle of nowhere, but then the roads came. Giant, colorful neon signs were a beacon for adult travelers seeking adult adventure; and the rest, as they say, is history.

European Oddities

Never imported. Probably best.

Over the years, European automakers have produced an impressive array of stylish, sporty, sophisticated vehicles. And they've also coughed up these curiosities.



It's a bird. It's a plane. It's my ride to the bierfest.
1955 Messerschmitt KR200
German

Now this would impress a parking valet. Let's see: clear canopy over cockpit seating, narrow 'fuselage,' and front fenders that jut out like clipped wings. It doesn't really fly, does it?

Only if it's rear-ended by a truck. This 3-wheel 2-seat enclosed scooter is little, low to the ground, and so light that a buzzing 10hp one-cylinder engine pushes it to 60 mph. After WWII, Messerschmitt could no longer make planes for the Nazis, so they made cars...that looked like planes. The surprising popularity of this evolutionary dead-end seemed due to its classification as a motorcycle, which meant precious cost savings on tax and insurance. Plus no driver's license was needed, making this the perfect pick for elderly old dears who could no longer pass the driving test, as well as citizens who had lost their license for driving around drunk. You'd think that the prospect of being seen in public in one of these carnival rides would be motivation enough to obey the law. And sure, pedestrians were more likely to get knocked down by a blurry-eyed Messerschmitt driver. But at least they could get back up.



Let's just let the engineers do the styling.
1949 Citroën 2CV
French

Would any self-respecting American teenager pick up his girlfriend in a car like that? Yeah, I don't think so. If the aim was to make an uglier version of the VW bug, this was a success. By the way, is that what it competed with?

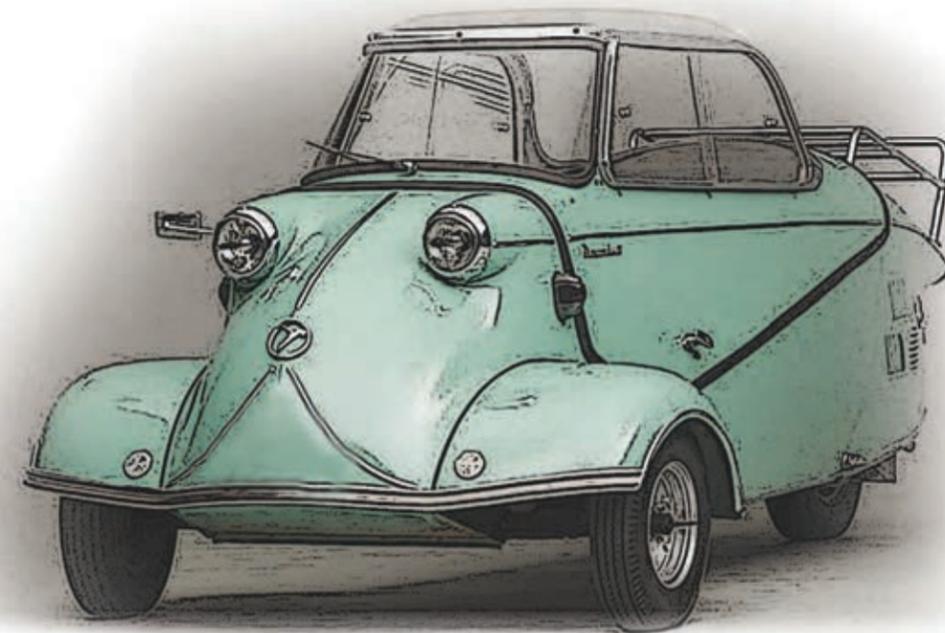
Well, in rural France in the 1950s, it originally competed with the horse and wagon, which is how folks there were still getting around. Soon generally popular enough to have a three-year waiting list, the 2CV almost single-handedly motorized the better part of a country. But don't let its homely design or hammock-like seats fool you; at the time, this baby was technically advanced, versatile, reliable and innovative in its simplicity. Plus it cost half as much as its German cousin. In addition to being a farm family's Sunday-drive car, it had a removable top for piling on farm products to take to market. Plus the production specs called for an extremely loose suspension that would allow it to carry fresh eggs over a plowed field without breaking. Can your car do that? Funny thing is, in the early 1970s, the iconic 2CV once again became highly popular, this time as a hip youth-culture status symbol. Go figure.



If a car and a motorcycle had a baby together...
1999 BMW C1
German

Whoa, if I spotted this riding in the next lane, I'd wreck for sure. Looks like they chopped the sides off a Smart Car just for fun. I'll bet a lot of people were surprised when this thing went from concept to production.

Shocked, I'd say. In the press kit, it was branded as the Urban Personal Commuter—a name that only a committee could come up with. BMW was hoping that Europeans who drove a motorcycle to work might want to cruise in just a little more comfort, but not too much more. The product without a category did benefit from solid BMW quality, boasting an interior reading light, heated seat and grips, and a sound system whose volume adjusted with the speed. But the core focus of the C1 was safety, with a roll cage for a car-like safety cell, plus a crumple zone for front-end collisions. Of course, if you were broadsided, all bets were off. BMW claimed that with all the protective features, a helmet was unnecessary. But stick-in-the-mud British officials didn't buy that story, thereby eliminating a major selling point. Plus the C1 was awkward at slow speeds. So in the end, BMW's quirky experiment rode the fast lane to nowhere.



Radio? Airbags? Cupholders? Ha!
1953 Iso Isetta
Italian

This little blob of transportation engineering looks like a family car for people with no family. Not a four-door. Not a two-door. But a one-door car that opens in the front like a refrigerator. Gee, why do you think that clever arrangement never caught on?

Hard to say. The original manufacturer, Iso SpA, tried their hand at carmaking after years of building—guess what—refrigerators. After WWII, Europeans needed cheap, basic transportation, and by delivering up to 70 mpg, the bubble-like Isetta was apparently worth parking one's pride at the curb. Licensed by BMW in Germany, the two-seater was fondly known there as the *Sargwagen*; this was roughly translated as "coffin on wheels," alluding to the fate of any riders unfortunate enough to partake in a head-on collision. The length of the Isetta was about the same as the width of American Buicks at the time, which means we could have almost carried one in the trunk as a spare, um, car. Eventually, as both families and income grew, folks in Europe would trade up to something much more roomy and practical—like a Mini Cooper.



The classic light, light, light delivery vehicle.
1953 Peugeot Trimoteur
French

As a kid, I had a bicycle with a basket in the front. I guess this was the next step up. But if you're delivering a heavy load of potatoes to the village market, you don't want to take those turns too fast, do you?

With a 15 mph max speed, I don't think that was much of a problem. But they certainly were clumsy little beasts to drive. Other than that, these business bikes actually were quite suited for light delivery on narrow, crowded city streets. Americans don't realize that in many parts of the world, motorcycles and scooters have been widely used as primary personal vehicles. Commercial vehicles too, apparently. In fact, the release of the Trimoteur was exciting news for small-time vendors who were understandably tired of trying to balance, say, 200 lbs. of lettuce on a bicycle. Plus the French, for some inexplicable reason, have always had a fondness for all kinds of three-wheeled vehicles, or *tripteurs*, both gasoline and foot-powered. In the wide-open U.S., of course, we tended to graduate from tricycles at about age 4, and it's never occurred to us to look back.



Seating for 4, 6, or heck, maybe 12.
1956 Fiat 600 Multipla
Italian

Is that the front? Or is that the back? Perhaps just step on the gas, and see which way it goes. Anyway, I thought the Plymouth Voyager was the first family minivan. But this must have been its granddaddy, right?

Sure looks like it. But if you were to stand next to one, you'd be surprised to see it's actually the size of a subcompact car. Enjoyed as urban taxis as well as family cars until the late '70s, the rear-engine Multipla came in a number of seating arrangements, but quite often squeezed in a lot more Italians than its official capacity. To keep prices affordable, Fiat designed the 600 with an absolute minimum of sheet metal. Safety, shmafety, right? So for just 24 installment payments, a big Roman family could own their first new auto, and escape all the other Multipla traffic for a spicy picnic in the countryside. An impressive 3 million of these distinctive little buggies were produced over the years, and sold in places as far away as Argentina. They were considered fun to drive, but I'm guessing only by people who had never been behind the wheel of a Ferrari.

More...

By Tom Tortorici

Tom is a car history buff who, by day, develops strategic marketing communications. For a free copy of "Selling to Stingy Buyers in a Stinky Economy" email tom@tortoriciinc.com.





Might be safer to just walk in the street.
1952 Felber Autoroller
Austrian

I think these would go over well in Texas. You could herd cattle with it, then dash to the mall.

Yep, Texans could hold their head high driving a Felber. Designed by a maker of motorcycle sidecars, it looks like they couldn't quite complete the transition to actual automobile. In an unusual arrangement, this three-wheeler's three seats were diagonally staggered. Plus the bodies were all painted a nice shade of industrial green, since that common paint was the cheapest. Inexplicably, when import restrictions were finally removed, Austrians ditched their domestic Autorollers in favor of "real" cars. And Felber went on to try their hand at washing machines.



Oh, no, here comes a speed bump, aaahhh!
2007 Piaggio Ape Calessino
Italian

I see it, but I'm not sure what I'm seeing. Is that a motorcycle under there pushing this thing?

Pretty much. The modernized, limited edition Ape (pronounced Ah-peh) pays homage to the open taxis that swept stylish tourists around southern Italy coastal resort towns in the 1950s and '60s. However these *Autorickshaws* have always been far more popular in India as well as throughout Southeast Asia. Many busy streets bustle with a colorful variety of both the personal and taxi versions, known as Tuk Tuks. But with several passengers and a motorcycle engine, trying to make it up a hill only provides amusement for onlookers.



Hey, with just 3 wheels, I'll save money on tires.
1970 Bond Bug
British

A wedge of cheese with wheels and headlights. At least it has the right number of headlights.

Don't laugh—with a top speed of 78 mph, this fiberglass-bodied automotive insect compared favorably with English 4-wheeled sports cars of the time. It was only available in Tangerine Orange, perhaps based on some questionable market research. The market, by the way, was 17-25 year olds, presumably color blind, who could drive it with only a motorcycle license. At the product launch, one proud company executive claimed that the Bug would "appeal to a much wider section of the market than we originally envisioned." Hmm, good luck with *that*.



A vision of the car of the future. Well, maybe not.
1922 Rumpler Tropfenwagen
Austrian

Is it an automobile shaped like a cigar? Or a cigar shaped like an automobile? Just not sure.

The Tropfenwagen foretold the future in one sense: it was the very first streamlined car. In fact, curious testing engineers just recently were astonished at its low drag coefficient. In lieu of fenders, its four distinct wings were designed to protect the body from splashed-up mud without creating forward resistance. The driver sat alone up front, like a no-nonsense pilot. The Rumpler originally caused a sensation at the 1921 Berlin Motor Show, but alas, it was just too advanced for the emerging carbuying market, which collectively looked at it, shook its head, and walked away.



We need you to deliver 6 refrigerators right away.
1948 Piaggio Cross Country
Italian

Cross country? I think this little tricycle truck should win a prize if it makes it cross-town.

Developed by the inventor of the Vespa (note front fender), these nubby little delivery vehicles were tougher than they looked—even if their drivers didn't look so tough. One-seaters steered with handlebars, they were designed to slowly nose their way through busy urban streetscapes. After WWII, the need for cheap transport included the commercial market. Six decades later, the CC's modern, squared-off descendants still roam Italian and Greek cities. Though I imagine Athens deliverymen daydreaming about nice big red Ford pickups as they toot around in their Piaggios.



Can I give you a lift in my...space ship?
1934 Tatra 77
Czechoslovakian

Isn't that the '34 Cadillac Fleetwood? No, I'm mistaken; the Caddy didn't have a dorsal fin.

Designed by a zeppelin aerodynamic engineer, the large, luxurious Tatra took the car streamlining craze to an obsessive new level. Innovative, fast, and nearly silent, it made extensive use of light magnesium alloys. The 77 looked so futuristic that a popular sci fi movie director ordered several for his upcoming film. Fourteen years later, many of the Tatra's unique features were borrowed by Preston Tucker for his own innovative machine. Fun fact: the steering wheel was placed in the middle of the front seat, perfect I suppose, for cruisin' with a pair of hot Czech babes.



Ransom Olds

A man stands in stunned silence as he watches the blazing fire. The founder of The Olds Motor Vehicle Company has arrived to see his only factory, his entire life's work, burn to the ground. Only one Oldsmobile is pulled from the inferno: the little runabout known as the 1901 Curved Dash Olds.

Young Ransom Olds was always fascinated by his father's machinery shop. It was there he began experimenting with steam engines, and later, gas engines, for creating self-propelled vehicles.

In 1897 he received enough help from investors to open his own automobile factory in Detroit. Unfortunately, buyers stayed away. His vehicles were complex, expensive, and not all that dependable. He tried electric cars, which had fewer problems, but were still too pricey.

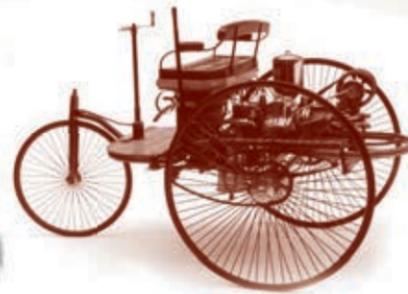
Undeterred, Olds began work on a new generation of smaller, lighter gas-powered cars. His two-seater, one-cylinder Curved Dash Olds got its name from its distinctively shaped dashboard.

That's when disaster struck. After the fire, contemplating his future, he noticed something surprising. Word had spread about the factory fire, and the rescue of the Curved Dash Olds. And Ransom Olds began receiving interest and inquiries on a scale he never had before.

Taking it as a sign, he decided to rebuild. But this time, he would abandon all the various previous models, and just focus on his curved-dash auto. His instincts paid off: orders poured in at \$650 per car, and production increased yearly. Olds had rescued his little runabout—and vice versa.

The Curved Dash Olds was the first mass-produced 'car of the people.' Olds used assembly line techniques to increase production fivefold, but not with the degree of automation and scale that Ford later introduced.

The public's affection for this versatile, economical car inspired the popular song "In My Merry Oldsmobile." And Olds' operation helped establish Detroit as the seat of the American car manufacturing industry.



Karl Benz

The spindly 3-wheeler begins to move of its own power. The curious crowd gasps at the very idea of it. But as it gains momentum, the driver struggles to control it before noisily crashing into a stone wall. Standing among the terrified onlookers is the machine's distraught inventor.

As a mechanical engineering student in the 1860s, Karl Benz rode his bicycle to class daydreaming about horseless carriages. After graduating, with his vision and newfound skills, he established a business partnership in Mannheim, Germany to develop reliable 2-stroke engines.

The venture soon ran into money problems, saved only by the dowry of Benz's fiancée Bertha. But when the growing company was forced to reorganize by bank lenders, Karl Benz was left with just 5% of the shares, and a lower position where his ideas were no longer considered. Frustrated, he left.

Next, he joined with two bicycle mechanics to build the 1885 Benz Patent Motorwagen. It rode on three wheels; no one knew yet how to turn two front wheels in unison. Still, Benz was awarded a patent for the very first vehicle designed and built with a gas engine.

Karl Benz predicted that an upcoming public demonstration of his powered tricycle would be a seminal event in the new age of the automobile. It was all quite exciting—up until the crash, at least. Suddenly, the motorcar's future didn't look quite so bright.

Benz went back to work, obsessively tinkering with improvements. One day, Karl's wife Bertha took their sons on an unprecedented 66-mile car trip to visit her mother. With the resulting publicity, she proved the practicality of the auto for everyday travel. Business picked up, with an updated 1888 trike becoming the first commercially available motor vehicle.

Success with well-crafted four-wheelers continued until 1926. Then, amidst economic crisis in Germany, Benz & Co. merged with a competitor, the company begun by Gottlieb Daimler. The new models they produced were branded as Mercedes Benz.

FAILURE, DISASTER

... and the ...

UNLIKELY SUCCESS

... of our ...

Auto Industry PIONEERS

by
Tom Tortorici



Tom's collection of 1:18 scale model cars chronicles the entire evolution of the automobile.



Armand Peugeot



The family manufacturing business had survived for a century by making solid decisions and avoiding risk. Now the son who is next in line wants to chance it all on the emerging and unproven automobile business. His family is horrified, and gangs up against him. Can he really defy them?

The family of industrialists had always made farm equipment, kitchenware, and other practical items that they knew people needed. When bicycles became popular in France, Armand Peugeot and his cousin agreed to build 'Penny Farthing' bikes with their distinctively huge front wheels.

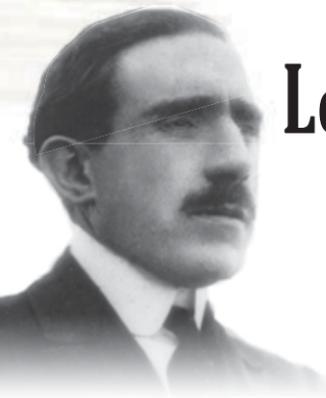
That led to the successful manufacture of motorcycles, and then, in 1891, a few early automobiles. Which was all fine, as long as those wheeled endeavors remained a small part of their large company. At the time, the idea that these self-propelled novelties might one day become commonplace didn't occur to most folks.

But it occurred to Armand Peugeot. He was convinced that the automobile represented the future, and wanted to shift the lion's share of the firm's resources in that direction. His cousin just as ferociously disagreed, and the rest of the family sided with the cousin.

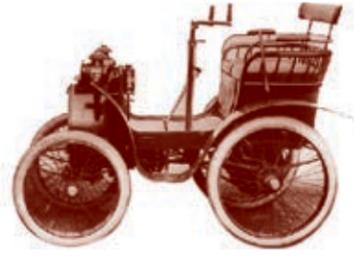
Alone, Armand was appalled that they'd miss this opportunity. The web of personal, professional and financial considerations made the family conflict all the more bitter. But he knew that the days were numbered for using horses as personal transport. He had one option left. He had to pursue his dream and see where it led.

Armand Peugeot broke away to establish one of the first dedicated carmaking companies in 1896. It lost money its first year, but became profitable soon after. As he extended his product line, sales continued to climb. When he stepped down in 1913, Peugeot was France's largest carmaker.

The family squabble eventually ended. But due to one member's vision, their company's legacy continued for another hundred years.



Louis Renault



The cars in the 1903 Paris-to-Madrid race are kicking up clouds of dust, causing drivers to lose their bearings. Dangerous conditions and alarming accidents force distressed officials to call the race off early. One of the racers now waits for another, his brother, who never shows up.

The Renault corporation was created in 1899 by an ambitious engineer who wanted to take his automobile prototypes to the next level. Louis Renault talked his brothers Marcel and Fernand into coming into business with him to handle business affairs.

Louis knew that the popularity and credibility of early automobile brands came from success on the race course. That's why both he and Marcel entered to drive Renault cars at the well-publicized Paris race. Early on, both managed to propel themselves into leading positions.

But over two hundred cars jostling for position on bumpy roads, combined with dense dust and enthusiastic spectators crowding onto the course, created a perfect storm. Blinded, exhausted drivers inadvertently plowed into people, trees and each other. Abandoned cars with broken axles and burning gas tanks added to the obstacles.

After the race was shut down in Bordeaux, Louis Renault waited there, wondering why his brother Marcel's car hadn't shown up yet. Finally, he heard that Marcel had crashed at Couhé Vêrac. Marcel died the next day from injuries. Devastated, Louis never raced again. Not long after, his other brother Fernand left the firm due to deteriorating health, then soon died too.

Now on his own, Louis threw himself into handling both the business side and the production side of the company. The result was Renault's growing reputation for quality and innovation, which helped sell entire fleets of cars as Paris and London taxis. The brand even became the most popular import in the U.S. During WWI, Renault supplied robust military vehicles for the French Army, earning the lone surviving brother a prestigious Legion of Honor award.



Henry Ford



It's after hours, and the only one still at the office is the company president. Solemnly, he looks at a stack of bills that he knows he cannot pay. After two failures in the carmaking business, he wonders if this will be the third strike that will take him out of the game for good.

Henry Ford's father was a farmer, but young Henry was more interested in building things than growing things. When internal combustion engines came along, he became yet another clever tinkerer trying to create a horseless carriage. The result was his one little Quadricycle, which he proudly tooted around in, with his wife at his side.

Ford was good at conveying his vision, and persuaded investors to set him up in business. But Henry didn't actually know anything about running a company. He learned, but not fast enough, and the firm was shut down. Strike one.

Henry kept experimenting, especially with cars he could race. The success he achieved with his 26-hp racer in 1901 helped rebuild his reputation. On the strength of that winning performance, investors were brought back together to establish a new carmaking firm, the Henry Ford Co.

This time, Ford was made Chief Engineer, and a professional manager was brought in named Henry Leland. But Ford didn't like answering to someone else, and the quarrels led him to abandon the company that bore his name. Strike 2. Leland stayed, and rebranded as The Cadillac Automobile Co.

Ford's third attempt was made in partnership with an old acquaintance. Ford & Malcomson was chartered to build affordable autos, but had trouble affording the components bought from suppliers such as the Dodge brothers.

Ford decided to take to the racetrack once again, and his ferocious '999' racer broke the land speed record at 91mph. A famous race driver took the car on tour, and the national publicity it generated gave Henry his momentum back.

With a new group of investors, including the Dodge brothers, Henry finally found success with his Model A. In just a few years he would rock the world with his iconic Model T.

AN IRONIC LOOK BACK AT THE WORLD'S Police Cars

For every law that's been made throughout history, some dang fool, somewhere, has broken it. Here are some of the novel ways law officers have taken to the road to track down the morally challenged.

c1962 German Isetta State Police Car

Would love to have seen this little one-cylinder bubble car try to catch a Porsche 911 on the Autobahn.



c1960 Scottish Pedal-Powered (!) Police Car

This motorless wonder probably struggled to apprehend a fast-walking jaywalker.



A CLASSIC: 1963 Ford Galaxie 500 Police Interceptor

Hard to sneak up on speeders and other hoodlums when they learned to spot a 'cherry top' light from a mile away.



c1880 Chicago Horse-Drawn Police Wagon

The windy city's finest, patiently waiting for the invention of motorized patrol cars.



1912 Ford Model T Paddy Wagon

Dedicated lawmen rounding up all the citizens they caught having fun on Sunday.



1924 Los Angeles Holding Cell Sidecar

Perhaps the punishment for moving violations was 30 days in a moving jail.

BY TOM TORTORICI

Tom writes about the fascinating social history of motor vehicles.



AN IRONIC LOOK BACK AT THE WORLD'S Fire Trucks

In the early days, a knocked-over kerosene lantern could set an entire neighborhood of wooden buildings ablaze. When the primitive fire rigs finally arrived, they squirted a little water as a token gesture, then waited for the inferno to burn itself out.



1937 Seagrave Safety Sedan Limousine

While some firefighters clung to the backs of swerving trucks, Detroit crews—and their hoses—preferred to arrive in comfort and style.



c1960 Japanese All-Terrain Water Tanker

If cars didn't get out of the way, well, it could always just roll over them.

A CLASSIC: 1955 Maxim Reserve Tanker

Some fire departments apparently decided a convertible would be nice for riding to fires on pleasant spring days.



c1875 Horse-Drawn Hook & Ladder

Trudging uphill with just 3 horsepower, firemen had to get out and run alongside – then were too exhausted to actually fight the fire.



c1903 Steam-Powered Pumper

Pausing to take a picture before rushing to the orphanage fire.

c1953 Italian Fire Supply Rig

Made to squeeze through narrow, crowded city streets, these tiny 3-wheelers toted gear and water – hopefully to a small fire.



MORE >

AN IRONIC LOOK BACK AT THE WORLD'S

Ambulances

These days, you always pull over to let a speeding ambulance go by. But in times past, you might be sitting at the curb for a while, waiting for some of these old rigs to plod past on their way to the infirmary.

c1885 Canadian Horse-Drawn Ambulance



Why was it painted black like a hearse? Plainly, after a long, slow ride, things could go either way.



1914 City Ambulance

This crew looks like it was sent out for a typhoid epidemic, but is afraid to get out of the ambulance.



c1928 French Motorcycle Sidecar Ambulance

With no suspension and cobblestone streets, patients arrived sicker than when they left.



c1939 City Ambulance

Who knows whether it was fast or reliable, because in the art deco era, of course, it was all about elegant design.



1917 WWI Army Bicycle Ambulance

Hope the wounded soldier isn't in too much of a hurry, and the field hospital isn't on a hill.

A CLASSIC: 1964 Cadillac S&S Ambulance

The only icon of mid-century vehicle design that no one necessarily wanted to ride in.



How Japan shook up Detroit fifty years ago and how they ended up making each other better

BY TOM TORTORICI



“No American wants to drive a boxy little toy car.”

In the beginning, Detroit ruled.

For the longest time in America, ‘buying a car’ meant buying domestic. In the mid-1950s, when only 1% of the autos on US roads were imports, the Big Three had no reason to feel threatened.

Most of those ‘foreign cars’ went to niche and luxury buyers who enjoyed the thrill of European sports driving.

Meet the Beetles. One import to buck that trend was the one that soon became a common sight on US roads: the distinctive but dependable Volkswagen ‘Bug’.

This stripped-down, never-changing machine with its witty advertising tended to appeal to younger drivers and academic types rebelling against mainstream consumerism.

The Beetle was never really an option for the fast-growing suburban family market, who couldn’t picture folding themselves up to squeeze in.

Study abroad. In 1950, Ford’s massive River Rouge plant was visited by a Japanese gentleman, there to study production methods. He was inspired by the scale, but obsessed with ideas for improved efficiency. Those innovations would come in handy at his family automaking business back home; Toyota, like its handful of competitors, was rebuilding after WWII.

To keep things affordable for a nation in recovery mode, those companies were shifting to small, lightweight ‘Kei cars’. Scaling up just to accommodate local demand, the Japanese auto industry showed no signs

of becoming any kind of global force.

Taking a shot. Sensing opportunity in the growing American car culture, though, Japan began attempting some exports in 1957. But those cars didn’t sell well; American buyers just weren’t impressed with their quality.

The very first offering was meant to compete with the Beetle, but it was underpowered, tended to overheat, and shook when it managed to achieve high speeds. Though it did include an electrical outlet so the driver could shave while on the move.

Trouble in Detroit. In the 1960s, American car manufacturers were

grappling with emerging concerns, and new laws, regarding automobile safety and emissions. New pollution control hardware increased car prices without increasing car appeal. And no one thought to budget for all the safety recalls. Other quality issues seemed to reflect a ‘good enough’ complacency.

Then in 1973, Middle East oil embargos caused disruptive gas shortages and alarming price increases here. The sudden push for fuel efficiency added to carmakers’ burdens. Distressingly, early antipollution devices, and the growing popularity of air conditioning, were making their large cars gobble up

fuel even faster. The cascading problems were reflected in profit-and-loss statements.

Japan’s second attempt. Meanwhile, much improved Japanese imports had been popping up on more US driveways since the mid-60s. A good selection of higher-end European imports were posting stronger numbers also. But the broader middle-class market gave Japanese brands more room to grow. In fact, their small, fuel-efficient cars had caught the eye of European buyers too.

This time, Japanese engineers had shifted up to the quality expectations

of American car buyers. They had developed efficient, economical approaches to precision manufacturing methods. With new ‘Quality Circles,’ every worker took ownership of the final product. And in just a few years, those automakers helped turn the phrase *Made in Japan* from a negative into a positive.

Let’s make this simple. Japanese brands also controlled costs with a limited set of styles, colors and options. Customers could pick their car, sign the paperwork, and drive off. Many domestic vehicles were still custom ordered with each buyer’s set of preferences – an expensive approach that delayed

IMPORT

DOMESTIC

THEN

NOW



Global trade networks began to blur the line between 'foreign' and 'domestic.'

Differences in design and engineering began to fade.

gratification for several months.

In the late '70s, another round of long gas lines pushed even some hold-outs to sniff around Japanese dealership lots. It was clear that a small car with half the cylinders could get them there just as easy as a big, high-powered one. Reliable, affordable, gas-sipping Japanese models kept pouring into American ports.

Ironically, it didn't work both ways. For a time, Japan protected its own by banning car imports there.

"No American wants to drive a boxy little toy car." Having been on top for so long, Detroit was in denial at first that its domestic empire could ever be challenged. Car execs shared the hopeful, if dwindling, confidence that US buyers wouldn't be interested in those cheap 'foreign' products.

Detroit had already started producing some mid-size cars, but the bulk of its trade was still mostly 'bigger is better' full-size vehicles. With their big, thirsty motors, *muscle cars* peaked by 1970. With a choice of engine sizes, smaller *pony cars* like the popular Mustang hung on longer.

Responding to the threat. The Big Three finally acknowledged the turn in public tastes by developing some compacts to add to dealer lots, despite lower profit margins. However, well-publicized and sometimes dangerous mechanical defects with some of those rushed-out product lines

further dinged Detroit's reputation. By the time US manufacturers managed to improve their small car offerings, they had already lost precious ground.

Domestic automakers fought back with *Made In America* themes in their advertising; *Buying American* was now a cause, not just a transaction.

Still, Detroit's hold continued to erode. By the end of the '70s, a third of all car sales were imports, and two-thirds of *those* were from Japan alone. On the global stage, Japan was surpassing the US as the world's biggest automobile manufacturer.

Detroit learns some lessons. In time, American car factories learned from their Japanese counterparts how to make more durable automobiles, with an engineering focus on how all the components and systems worked together.

Carmakers here also received advanced lessons in manufacturing automation, after doing things the same way for decades. They learned how to reduce vehicle mass and weight without sacrificing safety, and to focus on smaller, low-maintenance, high-revving engines.

The big changes made Detroit companies overall stronger than ever, though their resurgence landed in a permanently altered competitive landscape.

The Japanese learn some lessons too. Japanese manufacturers

picked up from US companies that design and style, not just engineering, count when selling automobiles. They came to understand the emotional component of car buying, which they could leverage in their marketing around the world.

They learned about product mix, and how to deliver it on a mass scale. They learned how updated styles and features kept people with perfectly good cars coming back.

In the end, competition between the two nations forced them to work both harder and smarter, to the benefit of all car buyers.

The great assimilation. The advent of global supply chain and assembly networks began to blur the once-clear line between 'foreign' and 'domestic.' Differences between American and Japanese approaches to design and engineering began to fade. Before long, the brand emblems were the only way to tell them apart.

If you can't beat 'em, join 'em. American car companies began joint ventures with Japanese firms to produce a number of successful models. Many US car dealers, at first rightly threatened by the growing popularity of imports, restored profitability by becoming dual dealerships, offering one American and one Japanese or other import brand.

Just as in global politics, those who were once adversaries were now allies.