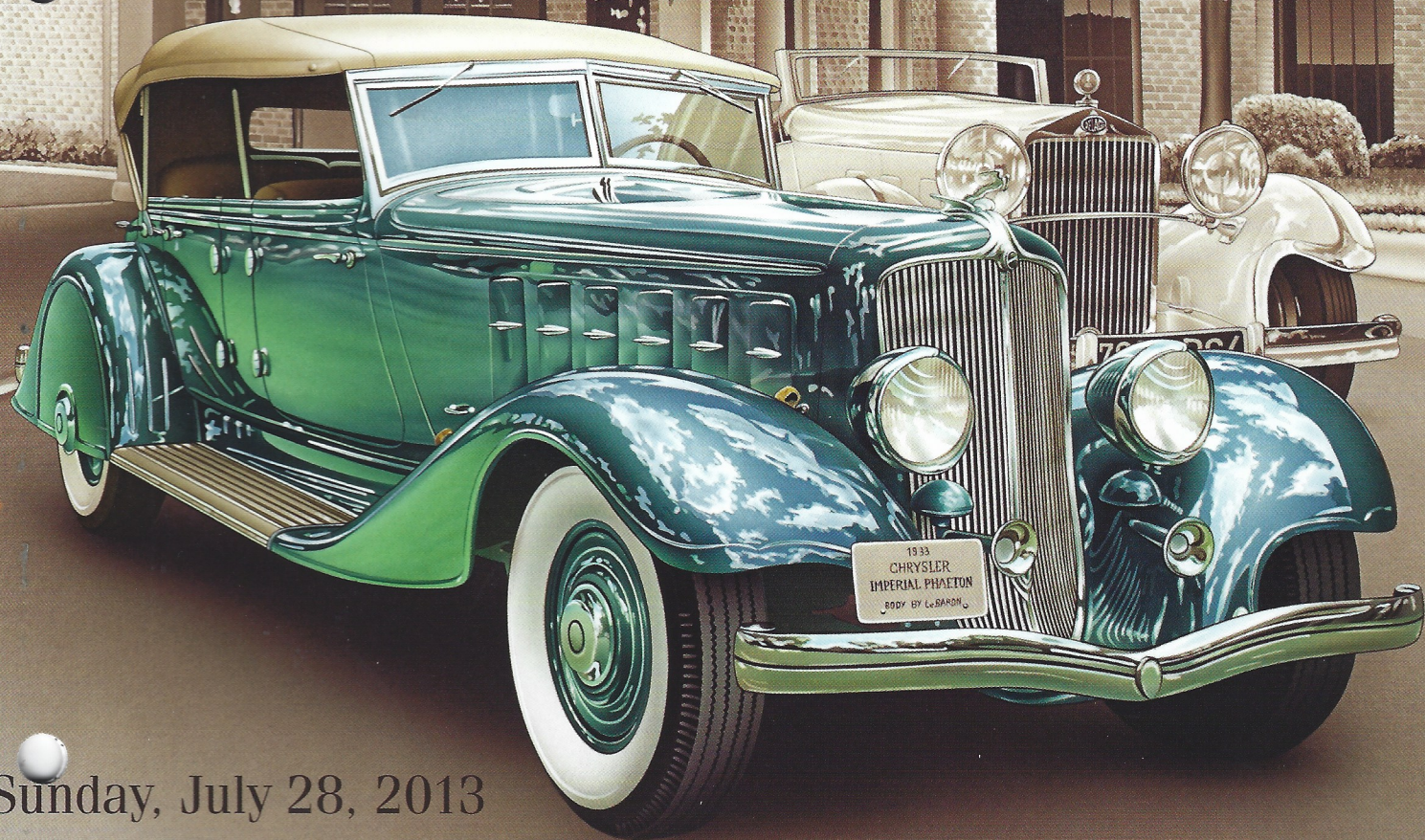


Concours d'Elegance

of America at St. John's

 GRANDE BALLROOM



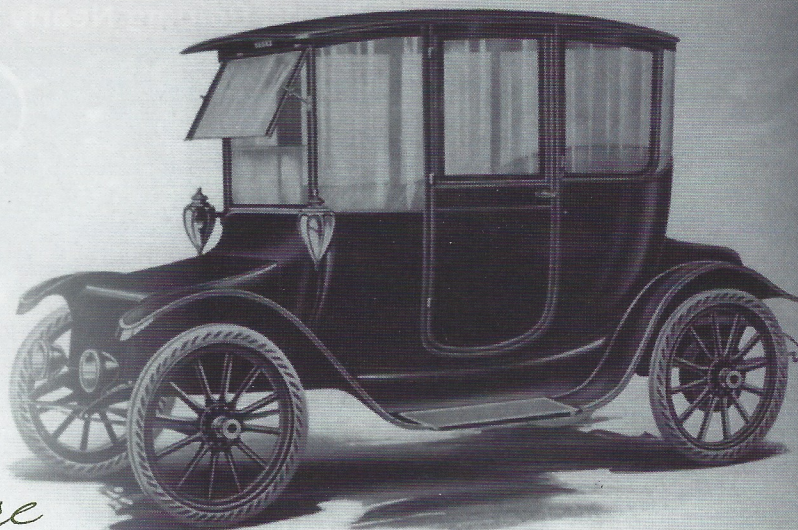
Sunday, July 28, 2013

The Inn at St. John's - Plymouth, MI

François / ruere

ELECTRIC VEHICLES

*Past, Present
and Future*



AS ALWAYS, IT'S ALL ABOUT COST, RANGE AND RECHARGE TIME

by Gary Witzenburg

Electric vehicles outsold gas cars 10-to-1 in the late 1890s, and a 1900 New York City Auto Show poll showed that Americans' first choice for automotive power was electric, followed closely by steam. And the nearly 4,200 motorcars built that year were split roughly one-third each electric, steam and gasoline.

Volatile and highly flammable gasoline was scary to store and carry around and scalding-hot steam was nearly as frightening. By contrast, electric energy was safe and easy to use. Electric vehicles didn't go very fast or far; but who needed to back then? Electrics, then as now, were effective short-run city cars. You didn't need to boil water for steam, or risk breaking your arm cranking a gas engine to life. And with no annoying noise or exhaust, people didn't hear you coming or smell you going.

On the other hand, EVs, then as now, suffered from a terrible trio of disadvantages: high (mostly battery) cost, short driving range and long recharge times. Once you used up your battery's charge, you were done. You couldn't go get a can of volts and carry it back. And it took hours, not minutes, to "refuel."

As the auto industry matured through the early 1900s, steam-powered personal vehicles died out while gas and electric grew. But EV sales peaked in 1912, after a series of significant advancements in automotive transportation combined to quash their popularity: the fast-improving road system enabled relatively fast and easy cross-country travel, which EVs lacked the range to do; GM's Charles Kettering invented the electric starter, which allowed nearly anyone to operate a gas-powered car; and mass

production substantially lowered costs for volume makers, which soon drove smaller specialty (including EV) makers out of business.

The 2013 Concours d'Elegance of America Car Selection Committee has assembled a truly impressive display of historic, concept and production electric vehicles ranging from the industry's earliest days through today, plus a look forward toward tomorrow. For example:

On the field

1899 Oldsmobile Prototype Electric

(Ken and Don McDowell, Chelsea, MI) – Oldsmobile built between five and eight prototype electric cars between 1899 and 1901, all but one thought to be two-passenger Stanhope Runabouts. Very likely the single exception is this four-passenger Cabriolet, according to extensive research by owners Ken and Don McDowell, who bought it from its original owner in 1959 after many years in storage.

It was the only prototype electric to escape the Olds plant fire of March 9, 1901, probably because Ransom E. Olds was using it for his own personal transportation. The *Detroit Free Press* reported that only this one electric was saved because it was "one that a company official had been running," and a photo taken four months later shows Olds at the tiller of a four-passenger Olds Electric Cabriolet in a parade celebrating Detroit's Bicentennial.

Olds soon resigned from his company and moved back to his home town of Lansing with, according to the McDowells' research, three of his personally owned Oldsmobile



cars, and the electric Cabriolet's original owner probably bought it from him not long after that move. This one-off prototype's original (Willard by Sipe and Sigler) batteries are missing, but its Sievers and Erdman body, Sarven wood-spoke wheels and most everything else is original, unrestored. It is the second-oldest Oldsmobile known to exist and the only surviving electric.

1921 Milburn Electric Model 27L

(John McMullen, Lapeer, MI) – The Toledo, Ohio-based Milburn Wagon Company was building bodies for the Ohio Electric Car Company, among others, before beginning to manufacture its own electric cars in September 1914. The 1915 Milburn Model 15 Light Electric Coupe (\$1,485) and Roadster (\$1,285) shared the same 100-inch-wheelbase chassis. Lighter than EV competitors and the lowest-priced electrics of the time, they had a range of about 50 miles at 15-19 mph. Milburn added a Brougham in 1916, a Touring in 1917, and in 1918 a light delivery truck and a new sedan with a 30-mph top speed and a claimed 100-mile range.

Among the most popular and elegant cars of their time, Milburn electrics were used by President Woodrow Wilson's Secret Service and Wilson himself owned a 1918 Milburn Electric that he drove around the White House grounds. Between 1915 and 1923, the company built more than 4,000 cars. This 1921 Milburn Model 27L, owned by John McMullen, who bought it beautifully restored from a well-known collector, has tiller steering and a claimed range of up to 90 miles on its 84-volt battery pack.

1931 Detroit Electric Model 97 Opera Coupe

(Michael P. Lauth, Port Huron, MI) – Detroit Electrics were built first by the Anderson Electric Car Company and later by the Detroit Electric Car Company. They were sold mainly to women and doctors who wanted reliable starting and running without the rigorous and risky hand cranking required to fire up an internal combustion engine. Their top speed was 20 mph, adequate for city driving; their advertised range 80 miles.

Annual production peaked at 1,000-2,000 cars in the early 1910s, then rose again late that decade as the price of gasoline soared during WW I. The company's name changed to "The Detroit Electric Car Company" in 1920 to separate it from Anderson's body business (which became part of Murray Body) and motor/controller business (Elwell-Parker). It produced Detroit

Electrics until after the 1929 stock market crash, then filed for bankruptcy, was acquired and built 15 more new cars (and some refurbished ones) to special orders through 1939.

A total of 12,690 Detroit Electric cars were produced, but just 1,450 after 1920. Notable Detroit Electric owners included Thomas Edison, Mamie Eisenhower and John D. Rockefeller, Jr., who had a pair of Model 46 roadsters. Clara Ford, Henry's wife, drove Detroit Electrics from 1908 (when Henry bought her a Model C coupe with a special child seat) through the late teens. Her third car was a 1914 Model 47 brougham. This car was restored to perfect condition by a previous owner, and the carpet, fabric and exterior colors are as they were in 1931. With its four-hp, 84-volt powertrain, it can travel about 75 miles.

1966 GM Electrovair II

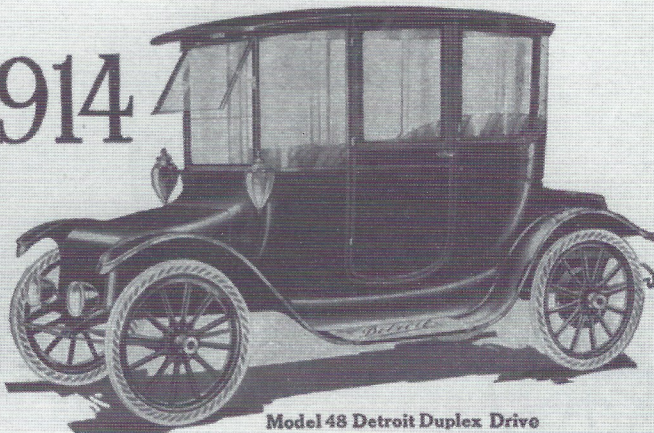
(General Motors Heritage Center, Sterling Heights, MI) – GM was exploring alternative power sources, including electric as far back as the mid-1960s, and this 1966 Electrovair II concept was a test bed for motor and controller development. In GM's second attempt at an electric Corvair (the first one didn't meet the engineers' hoped-for performance), its 532-volt silver-zinc battery pack uses up both its front trunk and what was its rear engine compartment.

Because those batteries were relatively light and compact (an equivalent conventional lead-acid pack would have weighed closer to 2,600 lbs.), the Electrovair II weighs only about 800 lbs. more than a standard Corvair. The silver-zinc batteries also offered good energy storage and high peak power, but they were expensive, and essentially worn out after about 100 recharges. The car's 115-hp AC-Induction motor provided acceleration competitive with the gasoline version and an 80-mph top speed, but its driving range on a charge was just 40-80 miles. Strictly an engineering exercise, the Electrovair II was never intended for production.

THE
Detroit **1914**
ELECTRIC

With Worm Gear Axle.	
5-pass. Brougham, Detroit Duplex Drive	\$3000
4-pass. Brougham, Rear Seat Drive	2850
Gentleman's Roadster	2500
With Bevel Gear Axle	
5-pass. Brougham, Front Seat Drive	\$2800
4-pass. Brougham, Rear Seat Drive	2550
Victoria	2300

All enclosed bodies are of our celebrated "Clear Vision" type. Seats are so arranged that no one sits in front of the driver.



Model 48 Detroit Duplex Drive



1966 GM Electrovan

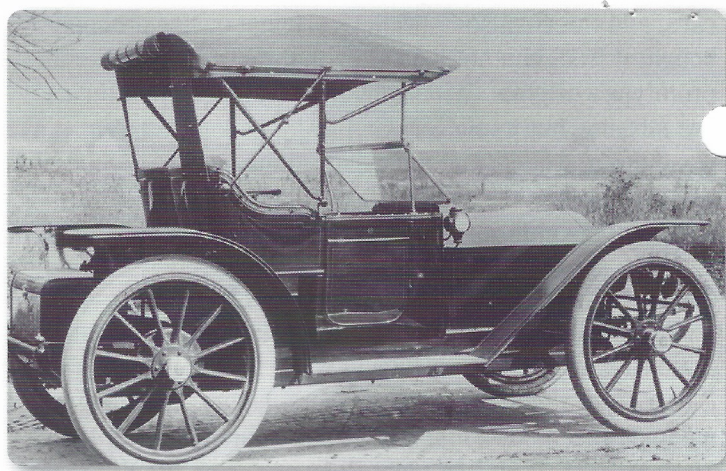
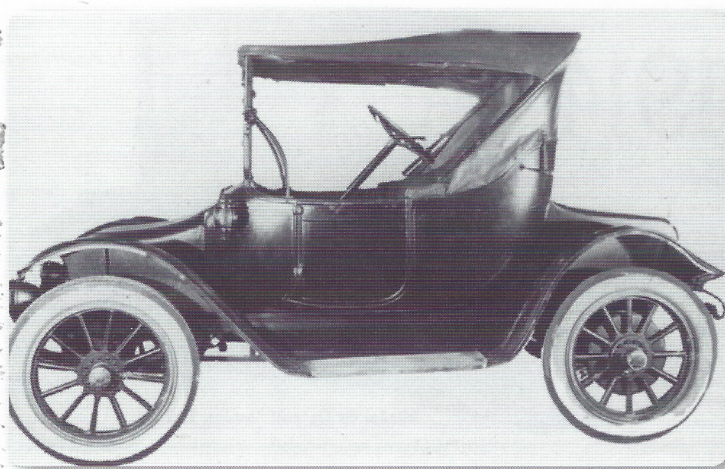
(General Motors Heritage Center, Sterling Heights, MI) – Hydrogen fuel cells have been around since the early 1800s, but this 1966 prototype Electrovan is believed to be the first fuel cell-powered vehicle ever built. GM Advanced Engineering Director Dr. Craig Marks and his staff developed the system for more than two years before building this first drivable vehicle. The original idea was to use a Corvair sedan, but the massive 550-lb. package required a much larger vehicle.

Its 5-kilowatt Union Carbide fuel cell was powered by super-cooled liquid hydrogen and liquid oxygen and could propel the Electrovan up to 70 mph, with a range of 120 miles. Looking more like an old whisky still than an exhaust-free vehicle propulsion system, the van's interior contained one large tank for the hydrogen, another for the oxygen and 550 feet of piping that barely left room for a driver and one passenger.

Due to safety concerns, the fuel cell van was used only on company property, and it did have a few mishaps. After one tank failure, extra precautions were taken to insure that no one working on it was injured...and no one ever was. Following a demonstration for journalists in 1966, the project was scrapped because it was cost-prohibitive and there was no hydrogen infrastructure in place.

1992 GM Impact Concept EV

(General Motors Heritage Center, Sterling Heights, MI) – This remarkable two-seat concept electric car led to GM's effort to design, build and market the first production EV from a major American automaker since the industry's early years. Co-engineered and developed by California high-tech contractor Aerovironment, it looked great, sprinted from zero to 60 mph in eight-seconds and had achieved – in one test (from 100 percent to zero state of charge), under ideal conditions at GM's Mesa, AZ Desert Proving Grounds – a remarkable 125 miles of range, better than any practical EV ever built.



So positive was the press and public reaction following its January 1990 L.A. Auto Show debut that then-CEO Roger Smith announced GM's intent to produce such a car at the National Press Club on April 22 (Earth Day). "I want General Motors to showcase its technology, and I want people to understand that we are in the lead on this," he said.

Then, on Sept. 28 of that year, California's Air Resources Board (CARB) mandated that two percent of the state's seven top-selling automakers' sales would be "zero emissions" (aka electric) vehicles, and that mandated sales percentage would ramp up over time, regardless of customer demand. Ken Baker, who headed Advanced Vehicle Engineering for GM's Chevrolet-Pontiac-Canada group and had been chief engineer on GM's short-lived early-1980s Electrovette (converted Chevy Chevette) project, was chosen to lead the effort. The race was on, and GM would lead it with what would become the 1997 production EV1.

2010 Tesla Roadster

(John McMullen, Lapeer, MI) -- A 288-hp electric sports car built by Tesla Motors in California between 2008 and 2012, the Tesla Roadster was the first production vehicle to use lithium-ion battery cells and the first production battery-electric vehicle (BEV) capable of a 200-plus-mile range. It can accelerate from 0 to 60 mph in 3.7-3.9 seconds, depending on the model.

Based on the British-built, gas-powered Lotus Elise roadster (but hardly a simple conversion), it was the first modern highway-capable production BEV available in the U.S. since GM's EV1. With no engine, gas tank or exhaust system, different body panels, aluminum tub, rear sub frame, ABS brake system, HVAC and rear suspension, Tesla says the total number of parts shared between its roadster and the Lotus Elise was less than 7 percent. Tesla sold more than 2,400 in 31 countries despite its high price (\$109,000 in the U.S.). ■

