EEVC NEWSLETTER

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email easternev@aol.com
President: Oliver Perry, 5 Old Stagecoach Turn
Shamong, NJ 08088, (609) 268-0944

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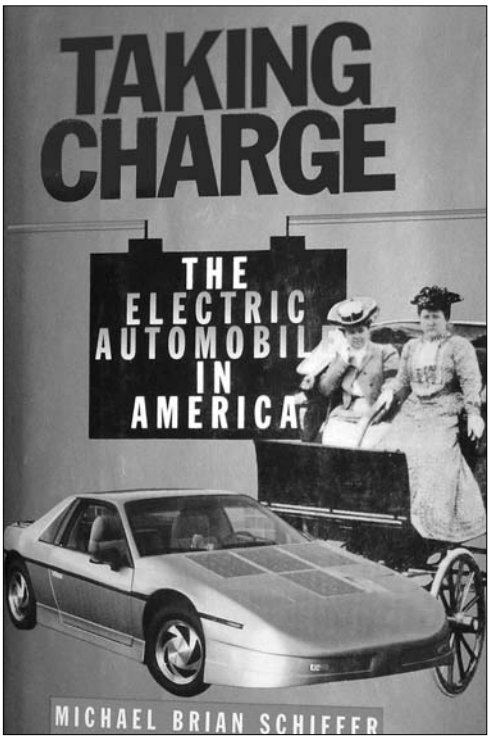
TAKING CHARGE
The Electric Automobile in America
A book by Michael Brian Schiffer
Oliver Perry

In *Taking Charge*, Michael Schiffer describes the history and future promise of electric cars in America. Schiffer covers in some detail the history of electric car development in the U.S. between 1895 and 1920. *Taking Charge* presents many facts and figures regarding U.S. electric car history, including numerous pictures of cars manufactured in that time period. He provides us with an "insider" view of the activities of some of the more dominant men and organizations that promoted electric cars at the beginning of the century.



From the book jacket

In the preface of the book Schiffer mentions that the idea for writing *Taking Charge* came to him when he was doing research for the book *The Portable Radio in American Life*. While he was paging through *Scientific American* and *Electrical World* from the late 1890s, he was impressed with the early promise of the electric automobile in America. It was clear to him that at that time period no one had a clue as to what type of car — electric, steam, or gasoline — would eventually prevail. Through his historical presentation of the electric car research and development at the turn of the century we come to understand that not only were there technical shortcomings that lead to the demise of the electric car, but there were also complex changing technological, cultural, and social forces at work. In reading the book I couldn't help but sense that almost every problem that the electric car enthusiasts encountered in their vain attempt to prevent the gasoline age from beginning still exists today. The debates, arguments, battles, and speculations over the future of the electric car back in the early 1900s have not changed much from then until now.

Search for a better battery

Edison, as most readers know, spent a great deal of his fame, fortune and time attempting to develop his nickel-iron battery for use in the electric car. Longer life, higher voltage, less weight, and greater dependability on rough roads, all for a reasonable cost, were the objectives that all battery companies sought. When Edison brought his prestige, name, and resources into the quest for a better battery, the public thought that battery limitations for electric cars would soon be history.

Newspapers of the time were filled with headlines and statements such as the following quote from the *Detroit Free Press*: "Thomas A. Edison thinks he has now invented the storage battery that will overcome the three main objections to the one now in use: weight, bulk, and length of time required to charge them. The new battery that he has been working on for months is so light that one large enough to run a butcher wagon can be put into a suit-case. It can be charged in four or five minutes, he says."

But the road to building a better battery was not easy even for the "Wizard" or "Old Man" as the mighty Edison was frequently called.

As with many noted inventors Edison was reluctant to release his product to consumers until he had perfected it. The news release of the "suitcase battery" placed Edison in an awkward position. He wasn't ready to hand the world a miracle battery. Among other things Edison found that quick charging was only possible if expensive charging equipment was used. As months turned into years of load testing in electric trolleys without the success Edison had predicted, the Exide Company began to experience a growth in sales of lead-acid batteries. Eventually many electric car companies of Edison's time period went back to using lead-acid batteries because the fear that the Edison battery wouldn't be able to perform as hyped.

According to the book *Taking Charge*, electric trucks eventually enabled Edison's investment in a larger battery manufacturing facility to survive, but not without severe strain. In the end the even the heavily hyped Edison battery was not able to prevent the gasoline car revolution.

A side note

Many electric cars of Edison's day could travel 100 miles and some were advertised to go over 200 miles. But as horses left the roads and the highways became paved, the speed of drivers increased. As electric auto speed went up, the distance traveled went down. Gasoline cars had the advantage of unlimited range in addition to speed. Car sales would quickly jump if "touring the country" was made possible. Gasoline made touring possible.

It is interesting to note that in 2005 we are experiencing a reverse trend in the speed vs. distance dilemma of traffic in many urban areas. There are so many cars on the highway in and near cities that speed of travel is slowing to that of the horses of 1900, enabling the range for electric cars (or the mileage for hybrids) to increase. Maybe there is justified reason to seriously consider a return to the electric car for extended city travel. As EEVC member Mike Manning informed us at the last meeting, the speed shop where he presently works has no trouble selling all of the "beefed up" electric golf carts they can make as neighborhood vehicles (NEV). Electric cars, especially NEVs, have plenty of range for local slower back street traffic, even with the limited present day battery technology. And, you don't have to rely on the local gas pumps for your fuel if you own one.

Back to the early 1900s

Michael Schiffer could not avoid including historical segments of the gasoline car in his historical coverage of the electric. Both industries were intertwined. Both had common components. Both were striving for dominance in the marketplace. Ford's decision to mass produce a gasoline car, rather than an electric, gave the internal combustion engine an edge in the race to dominate.

Schiffer points out that the well known and successful electric cars of the period were expensive. Even during the height of the electric car era most electrics were very expensive. Electric cars appealed to the elite and socially prestigious members of society. Many, if not most, of the electric car advocates were well financed women. They wanted elegance and frills inside the car, immaculate beauty outside, and easy trouble-free per-

formance. Cost was not a factor. Even after electric car sales slipped far behind the sale of gasoline cars, "high society" women continued to keep some failing electric car companies going. But as Henry Ford had proven, making a car affordable to the masses as opposed to manufacturing cars for the rich, was more profitable.* So it is not surprising that after the success of the Model T, somebody would soon argue that the time had come for someone to produce an inexpensive electric car, Henry Ford style, for the masses outside privileged status. Electric car promoters began to clamor for an inexpensive electric counterpart to Henry Ford's gasoline powered success.

Ford's Electric Car

What I found particularly surprising comes from the following quotation from Schiffer's book.

"While Ford's innovative production methods were being discussed by industrialists around the world, the Dearborn-based company delivered a bombshell: the electric car industry would have a Henry Ford, and it would be none other than Henry himself! During an interview at the New York automobile show, Ford announced the he and Thomas Edison were developing an electric car for the mass market; it would have a range of 100 miles, use Edison batteries and sell for $600-$1000."

"Beginning on January 10, 1914, the popular press and trade magazines reported on the proposed Ford-Edison car, mentioning that this enterprise would lead to "another great factory". Although newspaper coverage of this startling announcement was confined to tiny articles buried deeply, it caused a flurry of interest. The electrical industry in particular was abuzz. *Motor World* applauded the move, contending that "the demand for such a vehicle is very real and very large."

Inquiries began to pour into Ford headquarters from job seekers, parts suppliers, potential dealers and distributors, and people eager to buy the new car. Letters also arrived from *Electrical World*, seeking more details about the car's construction and performance, the Electrical Vehicle Association, which invited Ford to join; and *Electric Vehicles* magazine, which sought information as well as a subscription. Electrical World was given no information, the EVA was politely but firmly put off, and the invitation to subscribe to *Electric Vehicles* was undoubtedly declined."

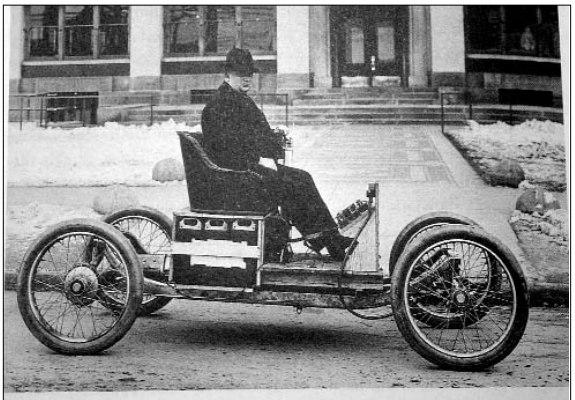


Figure 45. Fred Allison and the 1913 Ford experimental car. (From the collections of Henry Ford Museum & Greenfield Village, neg. 0-1923)

In his book Schiffer claims that EG Liebold, Ford's personal secretary, answered nearly all of Ford's personal mail. To a letter from an owner of an electric vehicle who wanted to counsel Ford as to how to best outfit this new electric, Liebold replied, "The Ford Motor Company itself does not contemplate building an electric car." Rather the electric car was a personal project of Henry Ford himself who would eventually organize a separate manufacturing company that might not be in operation until a year or more. Who would most likely head that company? In an original January interview Ford had mentioned the possibility of his only son Edsel, who at that time was 21 years of age!

Again, according to Schiffer it appears as if there were no plans to immediately rush an electric car into production. It also appeared as if Ford Motor Company wished to distance itself from the electric car in the event that it didn't meet expectations.

"When electric cars were still riding high in 1913, Edison and Ford were working together on somewhat strange projects." Ford was making an experimental electric car, and Edison, commissioned by Ford, was building an electric lighting and starting system for the model T. Both projects were linked to expand the market for Edison's nickel-iron battery.

The modified Model T was sent to West Orange, New Jersey, site of Edison's research facility, to be outfitted with a starting motor

and generator. The author relates that it took over a year of fooling around with oversized electric motors and cumbersome adjustments to install electrical starting systems in twenty Model Ts. In the end, problems with Edison's nickel-iron battery in cold weather caused Ford to believe that the nickel-iron battery was not suitable for starting gasoline engines. And it was not until 1919 that the Model T offered a stock electric starter on the enclosed body styles.

Meanwhile the Ford electric car took shape in a shed in Highland Park (Michigan?). Credit for the development of the car goes to a number of well known individuals including Edsel. Records indicate that efforts to refine the Ford electric went forward. Number two prototype was finished in 1914. Henry Ford gave it a test drive and was pleased with its performance. Edison provided some technical particulars and a picture of a bodiless car. The vehicle had a real steering wheel as opposed to a tiller but only had a top speed of 17 mph and a range record of 59.1 miles completed at a crawl.

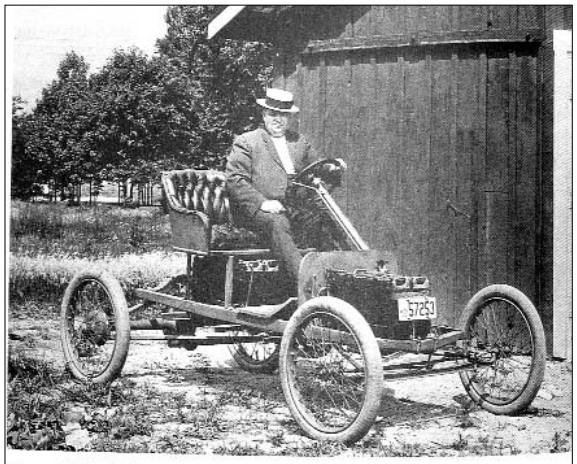


Figure 52. Ford Electric Car No. 2. (From the collections of Henry Ford Museum & Greenfield Village, neg. 188.72082)

Records show that the Ford team had many ideas for perfecting the vehicle's performance and they continued work through 1914. Edison made a visit to the plant in Dearborn that year and was reportedly to have been delighted with the little electric. However when he saw that his nickel-iron batteries had been replaced with lead-acid he had a fit. A rumor was afloat that the car would not run in the dead of winter on nickel-iron batteries. The author comments that it was more likely the case that somebody had left the charger off on a cold winter night and only fresh lead-acid batteries were available for instant replacement, rather than the fault of nickel-iron technology.

The car was not exhibited at the Pan-Pacific Exposition in 1915 even though Edison supported the idea. Still as inquiries arrived at the Ford Motor Company concerning the availability of the Ford electric, the written replies always stated that the car was a year away. By mid-1915 however, the "year away" response had changed to "still in the experimental stage". When or how the car would be finished could not be determined at that time. In a 1916 letter penned by a Mr. Anderson (a Ford Motor Company representative), "On account of the very extensive improvements and additions to the present factory the electric vehicle has not received a great deal of attention."

Well into 1917 The Ford Motor public position was that the electric car project was still in an experimental stage. However it was at this time that Ford and Edison ceased issuing grand pronouncements on their joint venture. With the general decline of interest in electric cars, the electric answer to the Model T would be silently abandoned.

Have things changed since then? One gets the picture from reading Schiffer's well-presented overview of electric vehicle development in the early 1900s, that in many ways today's electric car scenery is the same.

The whale swallowed Jonah

As most EEVC members have already learned through the history lessons of Guy Davis, the invention and practical application of the electric starter for internal combustion engines signaled the death of the electric car in the U.S. Up until the birth of the electric starter, women in particular greatly preferred (and indeed were limited to) electric car usage. Even the male population did not welcome the hand cranking opportunities afforded by the gasoline engines, especially in bad weather. But when the electric starter business began, did it really signal the end of electric cars? If internal combustion engines are considered a curse and blight on mankind, if tailpipes and mufflers are anathe-

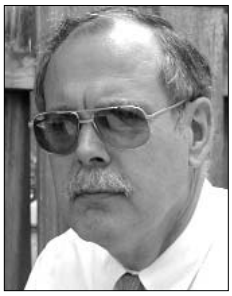
ma to cultured minds, and if gasoline is considered to be the worst liquid on earth, then the electric starter might be to blame for their proliferation. But if in 1919, one manufactured electric motors, generators, voltage regulators, batteries and related electrical switching components, the birth of the electric starter was a blessing. Electric power usage in gasoline automobiles probably increased the electric component of the auto industry far more than if gasoline engines were banned! It is doubtful that anywhere near as many automobiles would have been sold if the only choice was battery power. Gasoline created a larger automotive industry than battery power could have, at least at that time.

When Kettering perfected the electric starter system for gasoline cars he incorporated a tremendous amount of electrical know-how and electric principles. The gasoline car, The Whale, with its lighting system, generator, ignition system, starter, and battery system all linked with voltage regulation like the electrical lighting system of a miniature city, swallowed the whole electric car (Jonah) industry. The Delco Company came into being and soon became the major supplier of electrical components for gasoline cars. Almost immediately Delco hired 1200 employees and overnight grew into a gigantic electrical industry. All of the current (no pun intended) electric car technology of the day was incorporated under the hood of the gasoline car. For that reason I suggest that perhaps the gasoline engine expanded the automotive electrical power business faster than it otherwise would have been expanded by just the electric car business by itself. I am not sure that the electric car and associated battery business would have expanded nearly as rapidly as the petroleum based internal combustion automobile industry did.

Will the same happen again as the hybrid technology of today takes off? A tremendous electrical, electronic, and battery industry will be needed to support hybrid cars. And even if gasoline still is used as a primary fuel, components of the electric car and electric car technology will remain incorporated within the bodies of the hybrid. Some even see the eventual arrival of a plug in hybrid and the ultimate possibility of Jonah finally being spit out on the beach by the whale, to travel totally by himself without the internal combustion engine. With overcrowded highways and jammed city traffic, slower average speeds and less distances to travel, electric cars might actually someday dominate parts of our world. Probably it seemed like a long time to Jonah while he lay in the belly of the whale, but eventually he did come out! So for those of you who are depressed by the darkness, sunrise may be on the horizon. The battery powered car never totally died and it is not dead. It has been hidden away under the hoods of our present gas guzzling cars.

* Michael Schiffer provides the account in his book of Henry Ford's response to finding a bright new shiny red roadster in his plant upon his return from an extended trip. According to Schiffer, the plant engineers and mechanics who built the exciting prototype, thinking that Ford would greatly approve of their work, were stunned when Henry walked over to it; single handedly ripped off one of the doors, kicked holes in the canvas roof, and in general defaced the car in a fit of rage. He insisted that the road to success would come from producing ONE SIMPLE DESIGN and not departing from it. He was only interested in duplicating what his line was currently manufacturing. There would be only one car, one plan, and one color. The companies that tried to produce more than one line of product, in his mind, would fail in the marketplace because of high cost.

HYBRIDS IN THE HOV LANES
By California Pete



Recent legislation to allow hybrids in the high-occupancy Vehicle (HOV) lanes of California freeways and bridges with only one person has been creating some controversy. One complaint has come from the owners of the hybrids: in order to use the HOV lines it's necessary to work through two notorious bureaucracies — the DMV and FasTrak — and on top of that to purchase four "oversized puke-colored decals" to identify their cars. The horror!

ELECTION OF OFFICERS

The ballot for this year's election of officers is on the back page. Please mail your completed ballot to the club address. Winners will be announced at the December meeting.

NEW EEVC WEB SITE

Ron Groening reports that the new EEVC Web site is on line. It's at www.EEVC.info. More input is always welcome: Contact Ron at groening_ron@prodigy.net.

NEWS UPDATE

Toyota going plug-in?

Inside Fuels and Vehicles recently reported that Toyota may be developing plug-in hybrids, although "still leery of the limitations battery technology places on the endeavor."

A Toyota presentation on hybrids at the recent Tokyo Auto Show seems to have started the speculation. What will come of it remains to be seen, but if true it's exciting news.

ZAP sues DaimlerChrysler

ZAP (Santa Rosa, CA), which imports the Smart car and modifies it to meet U.S. federal and most state standards, has filed a lawsuit against DaimlerChrysler and affiliated companies and individuals, seeking in excess of $500 million in redress for "a more than year-long campaign of misconduct perpetrated against ZAP by DaimlerChrysler and Ulrich Walker, the then-CEO of its subsidiary Smart gmbh."

The suit accuses DaimlerChrysler of a series of anti-competitive tactics, "aimed at defaming ZAP and disrupting its third-party business relationships."

The suit claims that DaimlerChrysler, rather than working with ZAP in converting and marketing the Smart Car in the U.S., opposed it and engaged in misconduct in so doing. We shall see what comes of this.

Does God oppose greenhouse emissions?

The New York Times reported on November 7 that a number of evangelical groups have been voicing opposition to the lack of government action on global warming legislation, basing their criticism on the idea that allowing greenhouse emissions to warm the planet is a violation of the biblical injunction to be good stewards of the earth. It adds that the National Association of Evangelicals "is circulating among its leaders the draft of a policy statement that would encourage lawmakers to pass legislation creating mandatory controls for carbon emissions."

One of the group's biggest obstacles, says the *NYT*, is Senator James M. Inhofe (R, OK), chairman of the Senate Environment and Public Works Committee, himself an evangelical, who doubts that climate change is caused by human activities. There's also suspicion among some evangelical groups, who tend to be politically conservative, that the ones complaining about the environment may be a bunch of liberal treehuggers who might even espouse strange religious viewpoints.

More wind power for China?

The Xinhua news agency reports that wind energy can become China's third major power supply by 2020, with an expected installed capacity of 40 million kilowatts. This is twice that in a governmental plan in 2004. The report, "Wind Force 12 in China," jointly released on the eve of the Beijing International Renewable Energy Conference by the China Renewable Energy Industries Association (CREIA), Greenpeace and the EuropeanWind Energy Association (EWEA), said the capacity can satisfy the power demand of 80 million people with an estimated production of 80 billion kWh. It can also help reduce the emission of carbon dioxide by 48 million tons annually in the country.

Floating wind farms for Norway

Green Car Congress reports that the Norwegian energy and aluminum company Hydro is developing floating windmills for offshore power generation. "Using the same type of floating concrete structure technology applied in the North Sea oil industry for offshore rigs as a base, the Hywind systems are designed to work in sea depths of 200–700 meters (656–2297 feet)." The company envisions future wind turbines with a capacity of 5 MW and a rotor diameter of 120 meters.

COMING EVENTS

California's Transportation Energy Future
Dec. 1, Los Angeles, CA. Contact Matt Peak, 626-744-5601, mpeak@weststart.org.
Electric Drive Transportation Association Conference & Exposition 2005
Dec 6-8, Vancouver, BC. Call Pam Turner, EDTA Conference Manager, 408-395-0059, pturner@firstoptionevents.com.
Hybrid Vehicle Technologies 2006 Symposium
February 1-2, San Diego, CA. Contact Nancy Eiben, SAE International, 724-772-8525, naneiben@sae.org.
Motor & Drive Systems Conference
February 15-16, Miami. Contact Jeremy Martin at jeremym@infowebcom.com.
Clean Heavy Duty Vehicle 2006
Feb 22-24, San Diego, CA. Contact: Susan Romeo or Monica Alcaraz, 626-744-5600, Srromeo@weststart.org or Malcaraz@weststart.org, www.weststart.org.
2006 SAE World Congress
April 3-7, 2006, Detroit, MI. Contact Nancy Lewis or Shawn Andreassi, both of SAE International at 724-772-4068 or pr@sae.org.
Michelin Challenge Bibendum 2006
June 9-12, Paris. Contact at http://www.challengebibendum.com/challenge/front/affich.jsp?codeRubrique=45&lang=EN, or go to www.www.challengebibendum.com.
Convergence 2006
October 16-18, 20, Detroit, MI. Check www.sae.org.

MEETING SCHEDULE

Meetings are held in Room 35, Plymouth-Whitemarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m.

December 14

January 11

February 14

March 8

ADVERTISEMENTS

FOR SALE

1992 Dodge Colt with 18,000 miles. (Yes, you read correctly. There is minimal wear and tear on it.)

First-generation fully electric vehicle, converted for my aunt and uncle, Quakers who have been on the cutting-edge of the EV movement. The car is a fully-functional, fully-approved vehicle for use on all roads, with current PA inspection.

20 hp motor, multi-speed transmission (regular gear shift with no clutch)

Range of 20 miles. Goes up to 40 mph quite comfortably. Goes up to 60 easily, but has little power at higher speed, so highway driving is not recommended.

110-220 V Lester charger, off board. Using 110 takes about 5 hours for full charge Was purchased in 4/95 and has been repaired several times. You need to be able to park it fairly closely to an outlet.

Present Deka batteries were bought 9/03. #8C12 battery.wet (weighs 928 lbs) from East Penn Manufacturing Co. 12 V. six in back, two in front

No air conditioner (removed, since added weight)

Ideal buyer would be interested in tinkering, and in the technical aspects of the workings of a fully electric vehicle.

It is quirky, but any decent mechanic will be able to perform maintenance on most of it. Indeed, we have found that most mechanics have fun with it!

We are asking $2,500.

Interested? Tom Hoopes, Wayne, PA, 610-688-1522, eithercoe@comcast.net.

EEVC BALLOT 2005

President

- o Oliver Perry
- o Other (Write in)_____

Vice President

- ❑ Mike Deliso
- ❑ Other (Write in)_____

Secretary

- ❑ Anne and Tom Moore
- ❑ Other (Write in)_____

Treasurer

- ❑ Tullio Falini
- ❑ Other (Write in)_____

Editor

- ❑ Pete Cleaveland
- ❑ Other (Write in)_____

Send your completed ballot to the Club address, P.O. Box 134, Valley Forge, PA 19481-0134.

Election results will be announced at the December meeting.