

EEVC NEWSLETTER

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IT ALL BEGAN WITH STEAM Part II : Ford Museum Visit Oliver H. Perry

In the February issue we pictured several historic electric vehicles that I found of particular interest when my wife and I visited the Ford Museum last January. I thought our readers might enjoy a continuation of several more of our findings. Steam engines



Steam Tractor repaired by Henry Ford

played a great part in Henry Ford's career.

Those of you who are not students of Henry Ford's history might be interested to learn that the steam tractor pictured played an important role in Henry Ford's life and in the founding of the Ford Motor Company.

Henry Ford never went to college. (He did take a few courses in mechanical drawing, bookkeeping and business practice at a Detroit commercial college before he got

married). Henry Ford began his education in a one room school house in Dearborn, Michigan, a mile walk from the farm he grew up on. The McGuffey Readers were his first books. "The single room Dearborn school house with its dunce's cap, willow cane, and American

flag hanging on the wall had provided him, he felt, with an ideal start in life." (Page 9 of the book *Ford: The Men and the Machine* by Robert Lacey.)

At an early age Henry was recognized by his father as having very good mechanical skills and curiosity. William Ford's workshop contained many tools for Henry to grow up learning how to use. Young Henry soon became quite good at fixing almost anything,



1924 Doble steam car, Perhaps the most advanced steam car ever built, it could raise steam in 90 seconds from a cold start and cruise all day at 70 mph. Top speed was 100 mph. Fewer than 45 cars were built.

including delicate watches which he frequently brought home to repair.

A few months after his mother's death, at about the age of 13, while riding in a horse drawn wagon with his father on route to Detroit, Henry encountered a life changing sight. Coming toward him was a self propelled steam engine. It was the first vehicle not drawn by horses that Henry had ever seen. In a split second Henry was off the wagon and talking to the engineer of the steam engine. Almost 50 years later Henry could remember in detail all that the engineer told him about the engine. Henry Ford always regarded his encounter with the moving engine as his road to Damascus*. He had come face to face with his destiny.

** It was on the road to Damascus that the apostle Paul was struck with a blinding light and the voice of Jesus Christ. This experience changed Paul from a persecutor of Christians to one of the most revolutionary advocates of Christianity in history. Hence the phrase, "Damascus Experience:". life changing.*

According to some authors, at the age of 16 Henry claimed to have run away from the family farm near Dearborn to the city of Detroit and to take up an apprenticeship in a machine shop. One theory for the "runaway" is that young Henry blamed the hostility of his father William for the death of his mother. Robert Lacey in his book claims there is little evidence to back this claim up. William was known as caring and kind and according to Henry's siblings got a bum rap from son Henry. In fact there is evidence that William

took young Henry personally into the city and got him started on his career path in the Flowers Brothers Machine Shop.

After a number of months at Flowers Brothers, Henry moved on to the Detroit Dry Dock Company, the pioneers of iron ships and Bessemer steel. Here he worked hard by day and tinkered by night, considering going into the watch making and repair business. But in 1882, after finishing his apprenticeship, Henry returned to the farm. Was he a farmer with a bent for mechanics, or a mechanic with a bent for farming? It was hard to tell. The steam engine that earlier had inspired him was an agricultural machine that roped him in.

A neighbor of the Ford farm, John Gleason, purchased a portable steam engine from the Westinghouse company. He needed a mechanic to keep it running. Henry Ford admitted that the machine scared him but his recent apprenticeship in Detroit had given him the confidence to take the job as Gleason's engineer in spite of his fears. For three dollars a day and for 83 consecutive days young Henry Ford shepherded the engine around the neighboring farms for farmer Gleason. Ford became immensely fond of that machine, serial number 345, and never forgot it. Many years later when Henry Ford began searching for items for his museum he sent his men out into the world looking for that very engine. It was eventually discovered rusting and rotting away on a farm in Pennsylvania. Henry purchased it from the farmer for something like \$15, brought it home and had it fully restored. He was so thrilled at getting the old engine that he decided to give the farmer a brand new Model T as a token of appreciation. Ford played with the restored old engine for much of the remainder of his life and annually in September provided harvesting demos for curious friends, neighbors, and agricultural history buffs.

The maintenance of his neighbor's steam engine, used to operate farm machinery, started Henry Ford on his way to becoming the world's foremost automobile manufacturer of his time. From becoming the caretaker of Gleason's engine, Ford soon advanced to a becoming a traveling steam engine mechanic in Michigan.

Eventually Ford was called to Detroit to look at an engine that was becoming the rage

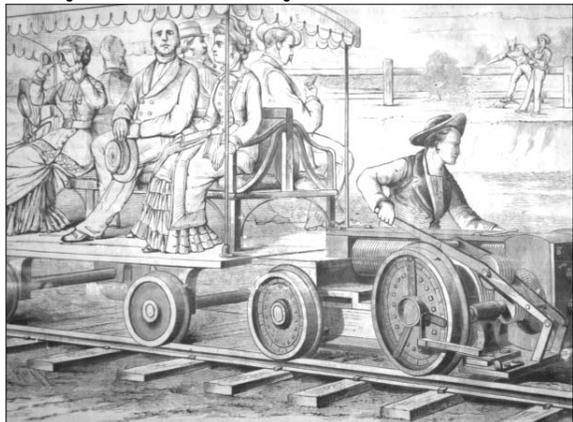


The Ford Museum includes a large collection of railway equipment, from the earliest models to present day. Shown is C&O Allgheny locomotive #1601, a 600-ton, 2-6-6-6 behemoth. Built in 1941 by Lima Locomotive and designed for hauling huge coal trains over the Allegheny mountains of West Virginia, it is one of the largest steam-powered locomotives ever built. It could reach speeds of up to 60 mph.

of world, an internal combustion engine called “the silent Otto.” It was here he got the idea for putting such an engine on wheels. In order to learn what he needed to learn he once again left the farm, moved into Detroit and took a job as a mechanic-engineer at a substation of the Edison Illuminating Company. It was in this environment that Henry Ford began his experiments with internal combustion engines and building a runabout.

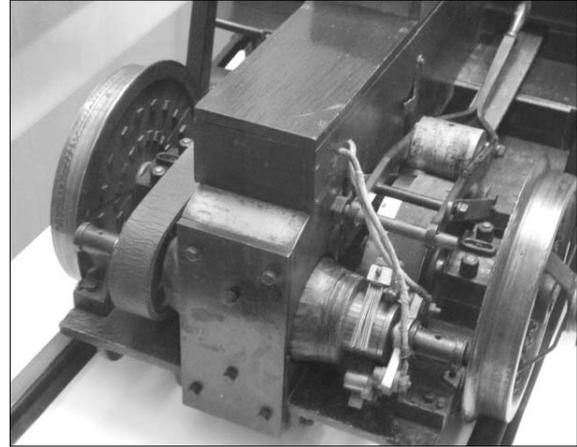
Steam played an important role in Henry Ford’s life and the development of his mind and skills. He rightly included the history of steam engines in his museum.

Early electric railways



Of special interest to electric vehicle enthusiasts is the exhibit in the Henry Ford Museum

of a model of Thomas Edison’s miniature electric railway vehicle which he used on his Edison campus. Reproduced above is an illustration that appeared in the February 3, 1894 edition of *Scientific American*.



A front view of the locomotive.



Editor’s note: Edison’s little train bears a remarkable resemblance to one built at about the same time by Werner von Siemens in Germany (the company he founded is now the German equivalent of General Electric in the U.S.). Introduced at the 1879 Berlin Trade Fair, the little train (above) travelled at 7 kph (4.4 mph) and drew its power from a third rail positioned between the two main rails. Some fairgoers were seen to lie down on the tracks to get a feel for the invisible force that propelled the train.

WELCOME SEPA AAPT TO VILLANOVA Oliver H. Perry

On April 25, 2009 the EEVC will provide an electric vehicle workshop for the Southeastern Pennsylvania Association of Physics

Teachers at Villanova University. The afternoon workshop will conclude the annual spring meeting of the SEPA/AAPT, consisting of both high school and college physics instructors. A number of electric and hybrid vehicles will be on hand for demonstrations following a lecture and panel discussion.

Theme: Inconvenient Truth regarding Electric and Hybrid Vehicles;

Separating fact from fiction, using fundamental physics principles

If a student takes a physics class in high school or in college it is expected that the student will improve his or her experience in critical thinking and hone the skill of applying basic laws of mathematics and physics to the surrounding world. Basic rules and physical laws govern the production and operation of the objects we manufacture and sell in the marketplace. A physics student should be able to recognize that all products that we create operate under fundamental natural laws of cause and effect. Most good students, for example, recognize that any device that claims perpetual motion is fraudulent. Perpetual motion defies the basic laws of physics. However, many fraudulent money makers still manage to hype their claims beyond the boundaries of the laws of physics and create confusion in the marketplace. We hope to help teachers apply some laws of physics and principles of mathematics to the electric and hybrid vehicle technology and separate fact from fiction.

Unfortunately a lot of hype has crept into the automotive world of green cars. Some members of the public are walking around with false ideas regarding what electric and hybrid cars can and cannot do. In spite of the “smart gauges” installed on the dashboards of many high tech hybrids, hybrid owners express fuel economy results that should raise the eyebrows of a thinking physics student. The Prius hybrid car, for all its hyped efficiency, cannot achieve 50 mpg against a wind, carrying four passengers, while climbing Pike’s Peak at 50 mph. Yet, somewhere someone will believe that science and technology have achieved such a milestone.

Our better physics students should be able to respond rationally to exaggerated claims.

Is it possible for a Prius to exceed 50 mpg climbing Pike’s Peak while carrying four adult passengers? An average physics student could “Google” the vertical height climbed by the car, approximate the mass of the car and the occupants, and calculate the minimum energy needed to lift the car that high. In fact making a ball park calculation might be a great exercise for your students.

Find the amount of energy in a liter of gasoline. Determine the amount of energy needed to move the vehicle first from zero to 50 mph of kinetic energy, and then add the much greater amount of increased gravitational potential energy to make the vertical climb. Using the amount of energy in a liter of gasoline, determine the minimum amount of fuel needed for the climb, assuming 100 % conversion of that fuel to energy.

Although the Prius is thought by some to be an electric car, ALL of the energy that a Prius uses comes from gasoline consumed by an internal combustion engine (ICE), including the fuel that is converted into electricity by an onboard generator. A gasoline ICE does not have the efficiency of a diesel engine. So the efficiency of the Prius engine has to be less than 40-50%. Therefore the amount of fuel calculated above must be doubled and then divided into the number of miles traveled up Pikes Peak to determine the mpg or miles per liter. Recognize that air resistance and rolling resistance were not figured into the results nor the losses from all of the components between the engine of the car and the wheels. If anyone claims that their Prius outperformed the calculations, you have serious reasons to doubt their claims.

The newer hybrids come equipped with LCD panels, fancy instruments that provide technical information and displays that provide both instant and average fuel economy. So most technical drivers should have an accurate fuel efficiency value by the time they reach the summit of a mountain. But don’t assume that, because someone reads their display while traveling down hill behind a large tractor trailer and reports they averaged 102 mpg, that their vehicle can do the same going up the same mountain, as some overly enthusiastic hypermilers indicate through omission of all of the facts. It is frequently inconvenient for some to tell you that

they had to average less than 50 mpg on occasion in order to get to their destination on time. The American public is becoming more aware of the need to know the facts behind the figures. But the news media reporters, hyping their wares, frequently make it clear that they didn't pass a physics course.

One More for the Road

Automotive writer Bill Visnic wrote an article in *Motor News* that was recently published in our local newspaper, the *Burlington County Times*. Quote: "With two tiny twin turbochargers that can spin at some 200,000 rpm the 3.5 liter EcoBoost V-6 can generate on demand, the grunt of a V-8 engine that might be 50 percent larger... The power to spin a turbocharger's compressor is free; it comes from the cyclonic energy in the engines 1700 degree exhaust." The picture caption of the EcoBoost's turbocharger unit stated that the turbine was spun at high velocity by the exhaust gas. (How fast is 200,000 rpm?)

Such erroneous illustrations like this show that many people who should know better do not understand the law of conservation of energy as applied to machines. Some are forever suggesting that we place generators on the wheels of electric cars to charge the batteries as we drive down the road or fill the sail of a sail boat with an on board electric fan.

The law of conservation of energy indicates that energy we use is not free. If something performs work then the energy to do that work had to come from somewhere. We should encourage our investigating students to follow the complete energy trail in the cases like above. If the flow of exhaust from the engine is in anyway restricted by the turbocharger which it passes through, then the engine has to provide extra energy to overcome the obstacle of the turbocharger. In other words it takes more energy to run the engine with the turbocharger, than running the engine without it. To say that the energy to spin the turbo charger is free is misleading. If the turbocharger blades in any way resist the flow of the exhaust gas then the power to spin it is not free. (If however, the heat in the exhaust system, which will be wasted, was used to spin the turbo charger, and not the moving particles of gas, then perhaps the energy could be in this specific case considered free.

Of interest is the fact that the turbocharger manages to force more fuel and air (and therefore chemical energy) into the combustion chamber of the engine than the mechanical energy it takes to spin it. If we follow the complete energy trail we begin with the chemical energy in the engine fuel. The turbo can enable the engine, an energy converter (heat to mechanical), to do more work in a shorter amount of time. It enables a smaller engine to produce greater power than it normally could, but not totally for free as the statement indicated.

FROM JENNY ISAACS

It is a busy spring for area EV owners. On Sunday, May 3 — right on the heels of the April 25th presentation to the Southeastern Pennsylvania Association of Physics Teachers — there will be a new and we hope annual EV Display open to the general public at Macungie Memorial Park, Macungie PA. We have eight vehicles committed already. EEVC members are invited to register to display their vehicles as well as participate on an owner panel on "Why and How I Converted My Car to Run on Batteries." Two free lunches will be available for each displaying vehicle! For more information email macungieevent@gmail.com or call 610-847-4908. This event is being supported by the Mid-Atlantic Renewable Energy Association (www.themarea.org) as well as by the EEVC, Bucks County Renewables and the Energy Justice Network. A good audience turn-out will help make this into an annual event, so please spread the word and plan to join us even if you can't display your vehicle!

Looking ahead to June, Bucks County Renewables will sponsor a five-day EV Conversion Workshop at the North Montco Technical Career Center in Lansdale, PA. The course will run from June 22 - 26 and offer hands-on experience converting a 1985 Volkswagen Vanagon to battery electric. The class is open to teachers and environmentalists; high school students are welcome if accompanied by a teacher or parent. All participating teachers will receive Act 48 credits. Details at www.buckscountyrenewables.com or call 610-847-4908.

21ST CAC

Don't forget the 21st Century Electric Vehicle Challenge, **April 17-19 on the campus of Penn State.**

Keep checking out the EEVC web site, www.eevc.info for the latest details. Plans are under way to have another great event. If you want to attend contact us.



Dr. Joel Anstrom, instructor at Penn State gives a tour of the Penn State Transportation shop facilities.

TAKING THE GOOD WITH THE BAD By California Pete



California — and the Bay Area in particular — remains a strange place. There's a lot to commend on the green energy front, a lot to make fun of on the lifestyle and political fronts, and some horror.

Support for a killer

Let's start with the horror: On March 21 Lovelle Mixon, out after seven years behind bars for assault with a deadly weapon and wanted because he had violated his parole, was pulled over by Oakland police in a routine traffic stop. Mixon opened fire and killed the two officers who had stopped him. He then fled to a nearby apartment where he hid. When a SWAT team arrived he fired an AK-47 through the door of the closet where he was hiding, killing two police and wounding another before he was killed. Later investigation implicated him in the unsolved rape of a 12 year old girl.

Police from all over the U.S., plus Canada, attended the funeral for the slain officers, but there were demonstrations also in support of

Mixon. Mind you, there has been a long history of animosity between the police and some citizens of Oakland, particularly African Americans — some of who view the police as an occupying army — and feelings were still raw about the killing of an unarmed black man by BART police a short while before, but these demonstrations seemed a little over the top, considering the circumstances.

Progress on biofuels?

The San Francisco Chronicle reported on April 5 that while venture capitalists and others are pouring money into biofuel startups (\$96 million in the first quarter of 2009), many located in the Bay Area, not all are thriving. In particular difficulty are the ethanol makers, suffering from a bad case of overcapacity (ethanol had its own bubble), with some companies close to ruin.

Interestingly, much of the development has gone into either cellulosic ethanol or biodiesel made from crop waste or wood. While it may cut down on the amount of corn diverted to fuel use, it won't help with deforestation or the damage to land caused by using for fuel the material that nature would allow to go back into the soil. Even one company working on oil-producing algae grows the stuff in dark tanks and feeds it sugar cane, wood chips and agricultural residues. What ever happened to the folks who were going to grow algae in clear plastic tubes in the desert, and recycle all the water they used to do it?

One, PetroAlgae, of Melbourne, FL, seems to be moving ahead, having gone public in December and winning a Sustainable Biofuels award in March. PetroSun, of Scottsdale, AZ, is also still there, but we haven't heard much news about either one. It's likely the current low price of conventional diesel is the problem.

Tesla sedan unveiled



On March 26 Tesla Motors unveiled its Model S sedan, according to *The San Francisco Chronicle*, announcing at the same time that the plant to build it will probably be in Southern California, rather than San Jose. Production isn't expected to begin until 2011, but the company is accepting orders: \$49,000 after a \$7500 federal tax credit. Expected range is 300 miles, and the company claims the car can hold "a 50-inch television, a mountain bike and a surfboard at the same time."

And some silliness

On March 27 the *Chronicle* reported that the San Francisco Democratic Party had passed a resolution "blasting the mayor for turning over undocumented youths arrested for felonies to federal authorities." That's right, SF for years had an official policy that no illegal alien who had contact with the police would be reported to Federal authorities (we've covered this before). This time the local party's Central Committee (Oddly enough, the only place you used to hear about a party Central Committee was the USSR; but I digress) also accused the police of "racial profiling in making traffic stops in neighborhoods with big immigrant populations." Apparently the DCCC wants the city to refrain from turning illegal aliens accused of crimes over to the feds unless or until they're actually convicted of the felonies charged. But aren't they already breaking the law?

NEWS UPDATE

GM teams with Segway for EV concept



General Motors, perhaps in a bid to show that it is actually an imaginative and forward-looking company, on April 7 unveiled an NEV (neighborhood electric vehicle) based on the Segway personal transporter and called the P.U.M.A. (for Personal Urban Mobility and Accessibility). No timeline was given for production of the 300-lb vehicle.

Despite GM's troubles, the word at press time was that despite the expectation the neither the first nor second-generation Volts will be profitable, the Obama administration would be unlikely to pull the plug on the project simply because it fits well with their goal of a greener GM.

At the same time, GM is making more and more contingency plans in case the bankruptcy option is needed.

Considering GM's present situation, the Segway thing is a little reminiscence of the spate of "wonder weapons" that Germany came up with as WWII was drawing to a close. While some of them embodied very advanced technology (the jet engine, rocket-powered planes, and more) they were too little, too late. The V-2 caused some damage but in the end only ensured employment in other countries for its developers (and led to the term "rocket scientist"). Even the mighty King Tiger tank, developed as an answer to the Soviet T34 that had bested the Panzer, could not be manufactured in the quantities necessary to make a difference.

CNN has a pretty good rundown of GM's history with EVs, going all the way back to an electric Olds in 1908. Take a look at http://money.cnn.com/galleries/2008/autos/0809/gallery.gm_electric_cars/index.html.

World's top selling EV: The Reva



It has recently come to our attention that the best-selling EV in the world is the Reva-i, with 6000 sold so far in Europe, Asia and Latin America. A true urban car (think of the Commuta-Car, Kewet, Th!nk, etc.) it's powered by eight 6-V lead-acid batteries feeding a 3 phase AC induction motor rated 13 kW (peak). Several models are offered, with seating for four, top speed of 80 kph (50 mph) and range of 80 km (50 miles).

Electric vans to be built in Kansas City

On March 27 AP reported that the British-U.S. consortium Smith Electric Vehicles U.S. Corp. plans to invest \$5 million to build a plant — to be located initially at the Kansas City International Airport — to build the

Smith Newton electric van. The vehicle, powered by lithium-ion batteries, would have a range of 100 miles. Already in use in Europe, the vans have a top speed of 50 mph and a payload of 16,280 pounds.

Chrysler moving ahead with EV plans

AP recently reported that Chrysler has announced that said A123Systems (Watertown, MA), will supply the lithium-ion batteries for the company's coming line of EVs and extended-range gas-electric cars. Chrysler said that it plans to start selling one of the five models from its ENVI unit next year.

EPA to regulate CO₂?

On March 24 *The Wall Street Journal* reported that the Environmental Protection Agency "has submitted a proposed finding to the White House indicating that 'carbon dioxide is a danger to public health,'" which could not only provide more backup for the Obama administration's proposed carbon cap & trade system (a not-so-thinly disguised carbon tax)

Mitsubishi ups planned EV production

On April 3 AP reported that Mitsubishi Motors has announced a planned increase in production of its MiEV due to unexpectedly brisk sales of the planned 2000 initial vehicle run. The company is increasing 2010 production from 4000 to 5000 units.

And in Australia

News reports say that the Australian government has registered the MiRV for use on that country's roads. While much of that country consists of endless highways across a barren landscape, there is still a need, the government feels, for an emissions-free urban vehicle, and has approved the car after it passed 83 safety requirements. At the same time, according to Autoblog Green, Vancouver, BC, Portland, OR, and San Francisco have signed on as test sites for the MiEV

Competition for Think plant

Todd Woody of Green Wombat reported in *Fortune* on April 6 that eight states are competing to be the site of a production plant planned by Norwegian electric car maker Think. Woody suggests that Think is banking on a DOE loan to help build the plant, which

would employ 300 at the outset and produce 16,000 cars a year — with the ability to expand to 60,000 cars a year and 900 employees.

More tax incentives for battery plants

AP reported on April 6 that the state of Michigan, with an eye on the Chevy Volt, among other things, is "is expanding its tax incentive program for companies developing and making advanced batteries used in hybrid and electric vehicles," adding \$220 million to the program to bring the total refundable tax credits to \$335 million.

Fedex finishes part 1 of hybrid van tests



Results of FedEx's first six months of testing its ten Daily hybrid diesel-electric vans built by Italian truck maker Iveco have been completed. Over the first six months of the trial, which will continue until May 2010, each vehicle covered an average of 7900 km with a 26.5% reduction in fuel consumption and a total decrease in CO₂ emissions of 7.5 tons when compared with a fleet of traditional vehicles.

EV production planned for Malaysia

AP reported on March 10 that Malaysian car maker Proton has signed a deal with Dutch startup company Detroit Electric to produce electric sedans. First production is planned for early 2010, and plans call for first-year production of 40,000, ramping up to 270,000 by 2013. The expected price would be between \$23,000 and \$33,000 for the cars, which are expected to have a range of 200 miles (320 km) and a top speed of 120 mph (195 kph).

Honda kills NGV fueling operation

Weststart-CALSTART reported on April 7 that Honda of America has abruptly shut down its FuelMaker home fueling entity, putting it into receivership, declaring bankruptcy and liquidating the holdings.

China aims to leapfrog West in EVs

The New York Times reported on April 2 that the government of China has adopted the goal of becoming pre-eminent in EVs, HEVs and PHEVs, and is adopting a three-year plan that includes subsidies of up to \$8800 “to taxi fleets and local government agencies in 13 Chinese cities for each hybrid or all-electric vehicle they purchase.”

EV plant zapped

On September 15, 2008 EV maker ZAP announced that ground had been broken for an EV factory in Franklin, KY by Integrity Automotive that was intended to manufacture the Alia and other ZAP vehicles. At that time the plant was expected to be in production within 12 months.

But not so fast. On March 6 AP reported that Integrity Automotive had shut down. Apparently plans to attract \$125 million in private bond financing had fallen through. All may not be lost, however; the AP story goes on to say that Integrity Automotive had changed its name to ZAP Motor Manufacturing Inc. and incorporated in Kentucky as a new company (with new people at the helm). We'll have to wait and see, apparently.

Better Li-ion batteries?

A March 27 by Prachi Patel in MIT's *Technology Review* reports that “Berkeley, CA-based startup Seo, Inc. says its lithium-ion cells will be safer, longer-lasting, lighter, and cheaper than current batteries. Seo's batteries use thin films of polymer as the electrolyte and high-energy-density, lightweight electrodes. Lawrence Berkeley National Laboratory is now making and testing cells designed by the University of California, Berkeley spinoff.”

Unlike conventional lithium batteries, which use “lithium cobalt oxide electrodes and a liquid electrolyte, typically lithium salts dissolved in an organic solvent.” Seo's has developed a solid polymer system that gets around some of the problems of the cobalt oxide system, which include limited power and life, as well as the possibility of fire and/or explosion. The article quotes Seo cofounder Mohit Singh that “Lifetime data suggests that conventional lithium-ion systems lose about 40 percent capacity in 500 cycles,” says, the cofounder of Seo. “We get a much

better cycle life. We can go through 1,000 cycles with less than 5 percent capacity loss.”

Unfortunately, limited ion conductivity would likely prevent use in EVs.

Would better supercapacitors help?

The answer to the Li-ion problem may be found in another article in *Technology Review*, this one by Katherine Bourzac and dated March 16. The article reports that researchers at the University of Maryland have developed nanostructured arrays of capacitors. The electrodes are cylindrical, made by electro-etching pits up to 50 nm in diameter and 30 nm deep into an aluminum-coated glass plate, then covering it with an insulating layer and another layer of aluminum.

“[[T]he Maryland group,” the article continues, “describes making 125-micrometer-wide arrays, each containing one million nanocapacitors. The surface area of each array is 250 times greater than that of a conventional capacitor of comparable size. The arrays' storage capacity is about 100 microfarads per square centimeter.” While this would have to be scaled up to be useful, it shows promise.

Berkeley: Liberal hotbed

It seems our impression of hybrid drivers as liberal an tending to live on the coasts is accurate, according to a blog posted by the *Los Angeles Times*, which reported that a study by UCLA's Institute of the Environment has found “that the rate of hybrid ownership is much higher in areas with pro-environment voting records and areas with higher incomes.” Berkeley stood out as an example.

This reminds us of a study reported more than 40 years ago. It seems researchers studying general happiness had found that young, good-looking, rich people with lots of friends were generally happier than old, poor, ugly disliked people. In other words: It is better to be rich and healthy than poor and sick.

Amazing.

COMING EVENTS

Roads to Renewal: A Summit on the Changing Automotive Industry — How Communities Can Thrive

April 14-15, Chicago. Go to <http://regional-summit.cargroup.org/>

Advanced Battery Mfg conference

April 15-17, Washington, DC. Go to www.infocastinc.com/index.php/conference/battery09

21st Century Automotive Challenge

April 17-19, State College, PA. contact Dr. Joel Anstrom, janstrom@enr.psu.edu, 814-863-8904, or go to www.eevc.info

2009 SAE World Congress

April 20-23, Detroit, MI. For info go to www.sae.org/congress/

Challenge Bibendum

Originally scheduled for April 26-29 in Rio De Janeiro, but postponed until 2010 due to the economic situation. For information go to www.challengebibendum.com.

BCI 121st Convention & Power Mart

May 3-6, Las Vegas, NV. Go to www.battery council.org/LinkClick.aspx?fileticket=I7sMopAJNpI%3d&tabid=68&mid=497

34th IEEE Photovoltaic Specialists Conference (in conjunction with SEIA's PV America Conference)

June 7-12, Philadelphia. For info go to www.34pvsc.org/

Plug-In 2009

August 10-13, Long Beach, CA. For info go to www.plugin2009.com/

Fifth IEEE Vehicle Power and Propulsion Conference

September 7-11, Dearborn, MI. For information go to www.vppc09.org/

Energy Conversion Congress and Expo

September 20-24, 2009. San Jose, CA. Go to www.eccc2009.org/

eCarTech 2009 1st International Fair for Electric Mobility

October 13 - 15, Munich. For info go to www.ecartec.eu/index.html

Battery Power 2009

October 20-21, Denver, CO. For information go to www.batterypoweronline.com/bppt-conf09/bp09_index.php

MEETING SCHEDULE

Meetings are held in Room 49, Plymouth-Whitmarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m. As in previous years, there

will be no July or August meetings.

April 9

May 13

June 10

***** FOR SALE *****

EEVC ex-president Ed Kreibick is enjoying retirement, but still cannot find time to work on all his toys. He has therefore decided to eliminate most of his electric vehicles to concentrate on the biofuels with his son Jimmy. He has two GE garden tractors, two CitiCars, a Fiat X1/9, an Escort Station Wagon and numerous motors, controllers and parts. He'll start, he says, with a 1975 CitiCar as follows:



Sale - 1975 Sebring-Vanguard CitiCar, 11,000 miles Vehicle is complete minus batteries. Orange with black seat. Comes with a copy of factory service manual with wiring diagrams. Good starter EV, top speed 38 mph, needs TLC. Pictures are attached and available via e-mail Price- \$750.00 call Ed Kreibick 215-396-8341 or ekreibick@verizon.net.

***** FOR SALE *****

1997 Chevy S-10 Electric Conversion

Runs well, has fairly new pack of sealed 12 V batteries in it. Range is about 18-20 miles at 45 mph. Full specs. are available at: <http://home.roadrunner.com/~pickupman2007>.

Interested parties contact Ken Olsen at pickupman2007@nc.rr.com.