

EEVC NEWSLETTER

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TURNING THE PRIUS INTO AN EV

Numerous owners of the Toyota Prius have wished at one time or another that there was a way to use the hybrid car as a plug-in EV. There's a group in California



There is a way to operate a Prius as an EV for short distances

devoted to doing just that, and they have a fairly simple way to do at least part of it (if you're handy with electronics and don't mind voiding the warranty, that is): a button.

On January 29 USA Today ran a story about a mysterious button found on the dashboard of the Prius. In U.S. cars it has no function, but in Europe and Japan it puts the car into the EV mode and allows it to go a mile or so on battery power alone. Toyota has never explained why it doesn't work in U.S. cars.

An organization called the California Cars Initiative (CalCars) has developed a set of directions to make the button work. They're available at CalCars' Web site,

[www.calscars.org/prius-evbutton-install.pdf](http://www.calcars.org/prius-evbutton-install.pdf).

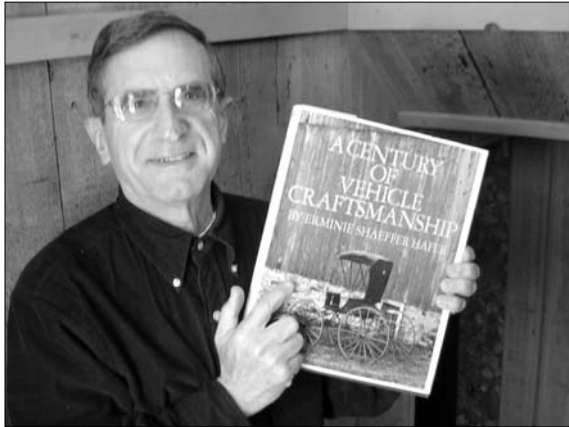
CalCars describes itself as a non-profit startup formed by a group of California entrepreneurs,

engineers, environmentalists and consumers to jump-start the market for plug-in hybrids, and are working on an assortment of projects, up to and including making the Prius into a plug-in hybrid. They're building a prototype PHEV and plan to harness the collective vision and purchasing power of individuals and corporate and government fleets. CalCars aims to engage with a major car maker to produce plug-in versions of existing sedans and SUVs. In the mean time a spokesman for Toyota professes astonishment that anybody would want to plug in a Prius. The whole point of the Prius, he asserts is to eliminate the need for plugging in the car. If only he understood!

EEVC TRIBUTE TO PAUL HAFER Part II

Introducing an author

When we remember Paul Hafer we remember a man from Boyertown, PA and The Boyertown Auto Body Works. The rich history of The Boyertown Auto Body works as well as the related history of vehicle making in Berks County is recorded in a wonderfully pictured book titled *A Century of Vehicle Craftsmanship* by Paul's wife Erminie. Erminie's book was dedicated to the craftsmen who made Boyertown and the surrounding area a bustling hub of vehicle activity for more than a century. Most of the information in our tribute to Paul Hafer comes from her book.



Erminie Florence Shaeffer was born of Pennsylvania Dutch heritage in September 1911. Erminie grew up and graduated high school in Boyertown and received a college degree from West Chester State Teachers College. After teaching elementary school for several years Erminie married Paul Hafer in 1933. Soon she was appointed to the board of directors of the Boyertown Auto Body Works where she has maintained active participation to the present. She co-founded the Hafer Foundation with her husband Paul and has served many years as a trustee of the Boyertown Museum of Historic Vehicles. The book she wrote was planned as a part of a 100 year celebration of the Boyertown Auto Body Works. Erminie spent several years in painstaking research for her book, resulting in a graphic masterpiece.

The Roots of an Industry

The early iron furnaces of the Boyertown area laid the groundwork for vehicle manufacturing by Pennsylvania Dutch craftsmen, many of whom traced their roots to the German Rhineland. Iron and cannons, iron for cannon balls, iron for wagon axles, iron for wagon wheel rims, and even the Conestoga wagons themselves were products of export from the Boyertown region in those early days of our nation's history.

Paul Hafer's life work had its beginning a century later when Jeremiah Sweinhart founded a carriage factory in Boyertown in 1872. Erminie Shaeffer Hafer points out in her book that by the mid nineteenth century Berks County had eleven iron furnaces and thirty-six bloomeries, forges and rolling mills. One of the largest iron mines was the one in Boyertown. In 1868 a shaft of 588 feet was made on the east side of what is now South Reading Avenue. A twenty-two foot thick vein of 50% magnetic content was discovered. Several more shafts were sunk in nearby locations and as many as 6000 tons of ore were being extracted by 1870. (The text did not stipulate the time span required to reach those 6000 tons.) Peak production years were reached in 1890. A frequent visitor to the mines was Thomas A. Edison who also owned iron mines nearby.

The need for wagons

Ore, when taken out of the ground, must be transported. Ore wagons, often pulled by six-mule teams, were constructed by the same craftsmen who had produced the Conestoga wagon, which to quote Erminie, were, "all hand forged and reflected the Pennsylvania German pride in creative arts." Carriages and wagons of all sorts, including sleighs, proliferated in the region when Sweinhart founded his carriage factory in 1872. Surrounded by talented wagon and carriage makers Sweinhart had the resources to build carriages and wagons at his disposal. But Sweinhart himself was also a skilled carriage and cabinet maker. So began the production of some of the finest carriages in the country. Many were custom built, a doctor would get, "just what the doctor ordered," as would a local fire company. (The first hand-made doctor's carriage and a fire carriage are on

display at the Boyertown Museum of Historic Vehicles).

Change of hands, a new direction

On January 1st, 1884 Jeremiah Sweinhart placed an advertisement in the local paper announcing his plan to sell his business at a low price. The vehicles for disposal were buggies, milk wagons, and elegant sleighs. The business became Strunk and Fisher, named after the men who purchased it. Fisher quickly sold out his share to a man by the name of Frank Hartman. Hartman and Strunk, the Carriage Builders, quickly expanded the carriage company beyond its original size. Amid a rich farming, mining, and industrial area, Boyertown was the ideal place for their company to meet the rapidly expanding transportation trade. Whereas Jeremiah Sweinhart had specialized in luxury type carriages, the new successors expanded the business to include bakery, milk, huckster, and ice cream wagons.

More changes

In 1890 Milton Strunk retired from the business, leaving his partner Frank Hartman on his own. One of the early decisions Frank made was to switch from steam power to electricity to run his carriage plant. The wiring was done by J. William Shaeffer, Boyertown's first electrical contractor. Paul Hafer would later marry his daughter, Erminie. The whole plant was powered by two large electric motors, not by internal combustion engines as were other industrial plants in the vicinity. In 1911 Hartman decided to relinquish his thriving business to four of his most trusted employees. After a short period of training the new name of "The Boyertown Carriage Works Ltd," emerged. Of the four men directing the company, only the pair by the names of Gilbert and Derr remained to mainstay the reputation of good will and quality craftsmanship. The duo assumed control in a time when the transportation trade was rapidly changing. Although Gilbert and Derr were still able to hold possession of the loyal and dedicated work force, they could not prevent the newer trends in transportation. "Soon more steering wheels would be sold than buggy whips, more cars than carriages." Gilbert and Derr quickly recognized

that changes were needed if they were to remain competitive. Displayed on their float in the November 11, 1918 Armistice Day parade was a banner which heralded; "The carriage days are passed; now we make truck bodies."

Berks County jumps on the new wave

Many of us were reared at a time when most vehicles seen on public highways were mass produced in Detroit and places outside Southeastern Pennsylvania. It is difficult for me to appreciate how significant a role the Boyertown area played in the history of automotive industry. From page 66 of *A Century of Vehicle Craftsmanship*, "Indeed it would appear that all of Berks County had become automotively enthused, anxious to join in this latest campaign in the Vehicle Revolution. Just as many Berks County craftsmen had hastened to take part in the flourishing wagon industry of the century previous, so too were their descendants quick to align themselves with those entrepreneurs of the new century whose avowed aim was to make people forget all about the horse as a mode of transportation."

Many of the skilled mechanics from the Reading Pa region helped to lay the foundations for the Fleetwood Metal Body Company, whose automobile bodies would become known on several continents and whose significance cannot be underestimated in the development of the automobile industry in Berks County. By 1917 the Fleetwood plant in neighboring Reading was acknowledged as one of the largest and best equipped in the country. It gave work to over 400 men and the trade name "Fleetwood" soon represented superior quality coachwork. In 1925 Fleetwood was merged with Fisher Body of Detroit and within a year became a division of General Motors Corporation. Through 1928 the Berks County plant turned out the new Cadillac and LaSalle bodies. (Examples on display at the Boyertown Museum)

Unique times, unique cars

Another interesting car company also operated out of Reading Pa at the same time. Originally called the Acme Motor Car Company, and then changed to the S.G.V., this company was the first car company to

employ a hot-water-jacket intake manifold preventing the flooding of the carburetor. The S.G.V. Company was proud that their entire car was built within their own facilities. The vehicle became generally acknowledged to be among the finest luxury cars in America and was seen in the most distinguished driveways of the world from the Vanderbilts to the Astors and from kings and queens to movie stars. But, according to *A Century of Vehicle Craftsmanship*, an experimental electric gearshift which also included lights and ignition, resulted in a “recall “calamity. In 1914 the company folded.

Other car companies from Berks County also made brief but important headlines in the initial stages of the automobile world. Companies such as Duryea, Daniels, and Dile also left their legacies and marks in Berks County history. (On display at the Boyertown Museum) It was in this initial automotive age that the Boyertown Carriage Works made the transition from horse drawn carriages to self propelled vehicles. They adapted their well-made wagon box to sit on a truck chassis, fully utilizing the skills in carriage making that they had mastered. For a time they serviced both the horse and horseless trade. But unlike their local competition, Boyertown Carriage Works survived and thrived well past the mid point of the twentieth century. Perhaps it was because the Boyertown Carriage Works never attempted to build an entire vehicle. They stuck to what they did best. They made carriage bodies.

Truck bodies only

The first commercial delivery truck body produced by the Boyertown Carriage Works was built in 1914 and is on display in Boyertown. It was built with wooden frame members and poplar wood panels with metal reinforcements. The original Boyertown Carriage Works primarily built buggies, horse drawn delivery and farm wagons. It was relatively easy to adjust their work to that of building truck bodies. When a bread delivery company recognized the potential for light self propelled trucks to expand their market they chose Dodge and White to make truck chassis and Boyertown Carriage Works to add the bodies. The Schwartz Motor Truck Corporation, another local company, attempted to

manufacture whole trucks but eventually went out of business by 1934. However if complete auto and truck manufacturing businesses could not make it in Berks County, a Boyertown company that specialized in truck bodies only, would.

Gilbert and Derr managed to survive the “in between” horse and horseless days by servicing both. But the time eventually came for the Boyertown Carriage Works to make a complete changeover to truck bodies only. As Erminie Hafer put it, “to their everlasting credit Messrs. Gilbert and Derr found three gentlemen who were enthusiastically willing to take over the Boyertown Carriage Works and set it on its future course.” One of the three was Paul Hafer’s father, as I mentioned in Part I last issue. The Carriage Works became the Boyertown Auto Body Works and the success story of the Hafer family.

Steel replaces wood

The Hafers initiated their careers in the exciting pioneering years of truck body building. Steel panels replaced wood, plymetal replaced wooden beams, and eventually steel channels, angles and zee members replaced all wood. The Hafers kept abreast of developing technology and adapted. They wisely formed alliances with suppliers who were capable of producing the newer and higher quality materials. When the Mack Truck Company of Allentown asked Boyertown Auto Body Works to design and build an all steel bus body the Hafers looked to Alan Wood Steel Company for the new “Danaloy” steel (a new high strength low alloy non-carbon steel) and to Parish Pressed Steel in Reading to shape it into the standard shapes needed for the bus body. That initiated a lasting working relationship between Boyertown Body Works and Parish. Parish was to eventually become one of the world’s leading producers of heat-treated truck frames.

High quality craftsmanship becomes the Hafer trademark

Under the Hafer leadership The Boyertown Auto Body Works successfully designed specialized truck bodies, tailored to their customer’s needs, and assembled the outsourced components, which were always manufactured to Boyertown specifications.

Hafer's dedication to quality began with the correct choice of basic raw materials and extended to the parts that went into every truck. Great emphasis was placed on the use of high strength, corrosion resistant steel. Paul Hafer made what he called an important breakthrough in truck body manufacturing by using a complete new family of Parish-manufactured parts in his new family of bodies for the Boyertown line. New developments in metallurgy that produced high strength low alloy steels were quickly utilized in producing solid route service trucks. The best (and often the latest) manufacturing equipment available was usually selected for use in truck building. Often the companies providing goods and services for Boyertown Auto Body Works ended up ordering trucks for themselves. The Boyertown Auto Body Works frequently did business with the same companies that provided parts for the biggest names in the truck building profession. Erminie Hafer recorded a sizable number of detailed historical descriptions of such joint venture companies in her book.

Time for the military

With the advent of both World War I and II all transportation-related companies became engaged in military vehicle construction. Following the bombing of Pearl Harbor the Boyertown Auto Works joined thousands of other companies in becoming 100% military production. Boyertown was selected by the military to develop and produce front line ambulances and mobile machine shop repair units even before the war officially began. A total of 2563 mobile units were constructed for the war effort. On May 24th 1943 the Army-Navy "E" award was presented to the Boyertown Auto Body Works for excellence in their war time service.

Post war expansion

Prosperity and expansion followed with the close of the war. Conversion to commercial truck bodies began in a 35,000 square feet of floor space in a single building. In 1947 a down payment was made to purchase 18 acres of neighboring abandoned mine properties for industrial development. 47, 000 square feet of additional floor space was planned for the future Boyertown Auto Body

Works. By 1961 the company had purchased even more property and had a new automated assembly plant in operation. Here they had the latest in truck body production methods and straight line assembly.

"Hello Mr. Softee!"

Page 154: *A Century of Vehicle Craftsmanship*: "In September of 1959 the casual visitor to Boyertown might have again thought that the town was the ice cream capital of Pennsylvania." Two brothers, William and James Conway, had pioneered and successfully marketed a new type of ice cream called Mr. Softee on the streets of Philadelphia. Within a year they had dealerships in three states, within seven years, twenty-four states." In 1959 the energetic Conway brothers approached the Boyertown Auto Body Works with their idea of building 800 mobile ice cream stores. The Boyertown firm, together with the Ford Motor Company, worked out the details for the Mr. Softee trucks."

Growth in "The Amazing Sixties"

As Boyertown Auto Body Works entered the sixties, Paul Hafer asked his employees to face the future with renewed faith and vigor for predicted expansion and growth. The Mini-Van delivery body became an answer to the increased demand for a more compact delivery vehicle. A modern conveyerized system with five additional assembly lines was added to the fabrication plant. Photographs of the time showed the continuous conveyor belt carrying parts, body panels, and assemblies through cleaning and paint drying ovens and onto the truck body assembly line without interruption.

In 1961 Paul Hafer was awarded the Boyertown Jaycees annual "Man of the Year" presentation for stimulating economic development in the Berks County region. In praising Hafer for his contributions to Boyertown the Jaycee representative added that Paul's leadership and civic assistance was felt beyond the community in scouting, manufacturing, and engineering. One of Paul Hafer's passionate interests was the Boy Scouts of America. He had received numerous awards in Scouting, including the Silver Beaver honor and the Silver Buffalo Award, the

highest national honor.

In the early sixties the Boyertown Works helped the US Post Office engineer a vehicle with a new windshield design, one that provided drivers with better visibility of pedestrians. 500 of these vehicles were shipped to the US Postal System from Boyertown. A new body design complete with the most up to date and elaborate rescue equipment was created for the Salvation Army Mobile Canteen Emergency Division. A substantial number of the famous "Boyertown Bookmobiles" were built and shipped to countries in Asia, Europe, Africa, and South America.

The following quantities of a few selected items provide an additional glimpse of the size and scope of the Boyertown Auto Body Works at the end of the sixties. From 1948 to 1972 the General Seating Company of Tipton, Pennsylvania, provided Boyertown with 70,000 seats. From 1958 until 1972 the Works received over one million feet of rubber extrusions. In the late sixties the Works was using 25,000 feet of windshield wrap per month. Normal monthly use of industrial coatings and paint products was usually between 800,000 and a million gallons.

Quality demands quality

As president of the Boyertown Auto Body Works, Paul Hafer had to form stable working relationships with his many industrial suppliers. The high quality truck bodies of Boyertown depended greatly on the quality of the products of Boyertown suppliers and the company's dependability. Paul Hafer took great care to establish long lasting business agreements with many excellent manufacturers and he was as proud of their success as he was his own.

In 1965 one of Boyertown's truck bodies created interest in Hollywood. Lawrence Welk purchased a Boyertown Multalloy bodied truck to transport the instruments used by his orchestra. But, as best I could judge from pages of Erminie's book, the "bread and butter" of the expanding company appeared to be military vans. It does not seem that the specialty division, although creative, could have existed solely on its own. These specialty vehicles, however, gave the company its unique flavor.

Investment in modern management

Management of a rapidly growing company provides challenges. "Ours is a brand-new Matrix planetary form of company," stated Paul Hafer in 1968. The board of directors determined corporate policy. Line production departments were each led by experienced trained superintendents and supervisors. Senior line production leaders trained their fellow line workers. All line departments were serviced directly by highly trained staff people who took care of payroll, purchasing, bill paying, costing, and estimating sales, advertising, engineering, research, and new product development. Superintendents, supervisors, and leaders were trained in the latest management techniques by outside consultants.

In order to reach the right solutions to "people problems" the board supplied an industrial relations consultant and a personal relations director. Line leaders and office group managers usually served as the hands on personnel managers but an office was set up to provide consultation to anyone who faced a personnel problem or who felt that his opportunities on the job were in need of adjustment.

(to be continued next month)

MUCH ADO ABOUT WIND By California Pete



Wind energy is rapidly increasing in popularity, and for obvious reasons: it's environmentally benign and inexpensive. What's not to like? The American Wind Energy Association (AWEA), which projects more than

2000 MW of new wind power capacity in 2005, as wind developers rush to complete their projects before the Production Tax Credit expires at the end of the year. That growth rate, AWEA says, will easily beat the records set in 2001 and 2003, when just under 1700 MW of wind power were installed. It will also be a significant improvement over 2004, when only 389 MW of wind power were installed.

A new rule proposed in late January by the

Federal Energy Regulatory Commission (FERC) may make wind energy grow even more quickly. The proposed FERC rules for connecting wind plants to the grid aim to remove barriers to wind-generated electricity while helping to ensure continued reliability of the power grid. To ease concerns about the effect of wind plants on the grid, FERC proposes to require wind plants to demonstrate the ability to continue operating when the grid experiences a low-voltage condition. Wind facilities would also be required to have supervisory control and data acquisition (SCADA) capability to ensure real-time communication with the operators of the transmission grid.

A February 2 story in the *Chicago Tribune* by Michael Hawthorne and Diane Rado reports that Illinois Gov. Rod Blagojevich wants more of the state's electricity to come from wind turbines and other renewable sources. The initiative would require at least 8 percent of the electricity sold in Illinois to come from renewable sources by 2012—which should amount to 4000 MW. Most of this would come from wind turbines, finally capitalizing on Chicago's nickname as "The Windy City." A 400 MW wind farm is already proposed in addition to an existing 50 MW installation in LaSalle County.



So everybody (except perhaps utilities, and Ted Kennedy, who doesn't want an off-shore wind farm to spoil the view from his estate on Martha's Vineyard) loves wind energy, right?

Not so fast. Some environmentalists consider wind turbines to be wildlife killers. A December 19 story in the *San Francisco Chronicle* by Jane Kay reports that California's Altamont Pass, the world's largest wind farm with 5000 windmills in a 50-square-mile area and producing enough electricity to

power 200,000 households, is also the worst in the country for slaughtering birds.

The area has a sizeable population of golden eagles, red-tailed hawks, American kestrels, burrowing owls and other raptors, and about 4700 of them are killed in collisions with the turbines every year. Seventy of these are golden eagles. The problem is that the turbine blades don't turn fast enough for the birds to see them as moving objects, and they knock the birds out of the air.

A study recommends replacing many of the existing turbines with more modern ones that sit on higher towers that create less danger for the birds. They'd also like to move the towers to the leeward side of the hills, to get them out of the raptors' soaring area.

The problem, of course, is cost: replacement can run \$1 million per megawatt.

Some companies are cooperating, and officials are meeting to discuss license renewals for existing turbines. We'll keep you posted.

ELECTRIC DRAG RACES SET FOR JUNE

The Power of DC electric drag races, organized by the National Electric Drag Racing Association (NEDRA), will be held at the Mason Dixon Dragway in Hagerstown, MD on June 11. Gates open at 11:00 a.m.; racing begins at 12:00 noon and ends at 5:00 p.m. The cost is \$25.00 per race vehicle and \$10 per spectator. For more information contact Chip Gribben at futurev@radix.net or . go to www.powerofdc.com.

NEWS UPDATE

Hybrids' popularity limited: survey

An AP story dated February 3 by John Porretto reports that a study from the forecasting arm of J.D. Power and Associates predicts that hybrids will probably peak at about 3 percent of U.S. sales, up from 88,000 or about 1/2 percent of sales in 2004.

Nissan Motor Co. chief executive Carlos Ghosn recently voiced reservations about hybrids from a business point of view.

Toyota, Fuji Heavy in talks for hybrid vehicle partnership

A Feb. 2 Kyodo story reports that Toyota Motor Corp. and Fuji Heavy Industries Ltd. said Wednesday have started negotiations to form a technology-sharing partnership in hybrid electric-gasoline vehicles. Fuji Heavy, (maker of Subaru), is expected to use Toyota's hybrid technology in its Legacy and other models. Toyota is already supplying the technology to Nissan Motor Co. and Ford. The *Nihon Keizai Shimbun* reported that Fuji Heavy is considering supplying Toyota with technology for lithium ion batteries for use in hybrid vehicles under the partnership.

Honda FCVs to Las Vegas

Automotive Industries reports that the city of Las Vegas will lease two Honda FCX fuel cell vehicles for two years at a cost of \$500 per vehicle per month. The vehicles will operate on a regular daily basis as part of their normal fleet operations and be refueled at a city-owned and operated hydrogen station. With the addition of the city of Las Vegas, Honda has a total of 14 FCX vehicles in regular daily use with six customers in three states.

Kawasaki makes strides in Hydrogen distribution

Kyodo News Service reported on January 26 that Kawasaki Heavy Industries Ltd. says it has succeeded in transporting liquid hydrogen in a special container over a distance of some 600 kilometers. Kawasaki built the container, including a 15-cubic-meter storage tank, under a 60 million yen government program. Kawasaki said it will develop liquid hydrogen containers for trains and ships as well.

Mitsubishi considering FCV

Kyodo News Service reported on Feb 7 that Mitsubishi Motors Corp. and Mitsubishi Heavy Industries Ltd. are considering joint development of a fuel-cell vehicle as part of the struggling automaker's revival effort under the heavy machinery maker's leadership. The development project would enhance the effect of collaboration for the rehabilitation of Mitsubishi Motors, which is mired in multiple vehicle defect coverups, sources said.

COMING EVENTS

2005 Clean Heavy Duty Conference

Feb 22-24, Palms Springs, CA. Contact Susan Romeo, 626-744-5686 or visit www.weststart.org

NHA Hydrogen Conference 2005

March 29-April 1, Washington, DC. Contact the National Hydrogen Association, 202-223-5547, or e-mail info@hydrogenassociation.org

POWER-GEN Renewable Energy

March 1-3, 2005, Las Vegas, NV. Contact Donna Welch, 918-835-3161, <http://pgre05.events.pennnet.com>.

EVS-21: The 21st Worldwide Battery, Hybrid and Fuel Cell Electric Vehicle Symposium & Exhibition

April 2-6, 2005, Monte Carlo, Monaco. Contact the EVS-21 Monaco Organization, +377 97 77 54 21/+377 97 77 54 22.

2005 SAE World Congress

April 11-14, Detroit. Contact Tim Mellon, 724-772-7162, tim@sae.org.

11th National Clean Cities Conference

May 1-4, 2005, Palm Springs, CA. Contact Annalloyd Thomason, 702-254-4180 x23 or 702-294-2333, or e-mail Info@afvi.org

Power of DC electric drag races

June 11, Mason-Dixon Dragway, Hagerstown, MD. Contact Chip Gribben at futurev@radix.net

5th International Advanced Automotive Battery (& Ultracapacitor) Conference (AABC-05)

June 13-17, Honolulu. Contact Advanced Automotive Batteries, 530-692-0140, info@advancedautobat.com.

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.

March 9

April 13

May 11

June 8