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America in Automobile
Electric Charge
Taking
with a respectable energy density; a set suitable for an electric car costs between $750 and $1,500. Significantly, lead-acid batteries can now be built to endure the rigors of boosting. Motors are more compact and lighter per horsepower than ever before, while retaining high efficiency. Solid-state controllers reliably give electric vehicles continuously variable speeds. Advances in bearings and lubrication make it possible to reduce drivetrain friction to very low levels. And strong, lightweight materials allow cars to shed excess weight. The upshot, as G. A. Pratt remarked in a 1992 article in Technology Review, is that “electric vehicle technology has improved enough so that a viable car can be made today.”

The need to transform AC to DC for battery charging remains, but new technology has decisively solved the old problems. Solid-state rectifiers are efficient, reliable, and compact; they can even be built into vehicles, making it possible to get a charge anywhere there is a standard AC outlet. What’s more, solid-state electronics permit the use of cheaper, lighter AC motors.

Above all, interest in electrics today is widespread, and many believe we are poised on the threshold of a new era of electric automobiles. As Newsweek announced in April 1991, “electric cars are coming.”

When I was last at Disneyland, a few years ago, my wife and I stood under the monorail track near the main entrance, waiting for our sons to finish their souvenir shopping. Pointing to the train passing almost noiselessly above, I remarked that this impressive technology was from the mid-1950s. How sad, I said wistfully, that no American city now boasts a monorail system. When first installed in Disneyland, the monorail pointed to the possibilities of “new” kinds of mass transit. Today it is just another big toy in an aging amusement park. During the fifties and sixties, Americans built freeways and widened streets to make room for more cars.

Not surprisingly, more cars are owned per capita in the United States than in any other large country. The price we pay for our freedom, for our “car culture,” is considerable: tens of thousands die yearly in accidents; cities suffer perpetual rush hours and noise pollution; countless hours are wasted in commuting; nonrenewable resources, imported at enormous expense, are consumed at a frightening rate; and in many urban areas the air is, to say the least, unhealthful. The obvious prescription for these ills is more and better mass transit, such as buses, subways, and light rail—including trolleys and monorails.

The vision that our cities can become more habitable if they have fewer cars and more mass transit is very appealing. However, most Americans and most American cities (now mainly suburbs) grew up with the automobile, adapted to it, and in its absence would be paralyzed. Weaning U.S. urbanites from their cars will require, at best, several decades as well as huge outlays of
capital that our depleted society seems incapable of supplying. Thus, while agitating for public transportation, Americans concerned about sick cities also see promise in switching over to alternative automobile technologies, especially the clean and quiet electric car. The electric does not solve every problem wrought by the automobile, but it solves a few problems well. That is why ordinary Americans have already brought into being a new era of electrics.

Tired of their smoggy air and decades of foot-dragging by Detroit, Californians decided in 1990 to force major automobile companies to commercialize electrics. The California Air Resources Board mandated that, in 1998, 2 percent of the new cars offered by manufacturers selling 3,000 or more cars in the state have zero emissions; now and for the foreseeable future only electrics can meet this stringent standard. In 2003 fully 10 percent of the cars sold by these companies in California must have zero emissions—an estimated 200,000 or more electrics. Under growing grass-roots pressure, a dozen other states, including New York, had by mid-1993 adopted or were considering similar codes. Assuming that oil company lobbyists and the Detroit Three do not succeed in getting the regulations gutted, it is forecast that automobile firms doing business in the United States will have to sell, in 2003, at least a half-million electric cars.

Needless to say, all large automakers want to do business in California, New York, and other states, and so they have reluctantly geared up programs to bring electrics to market. Interest in zero-polluting city cars is also emerging across the Atlantic, and this has provided a home-grown incentive for European automakers to commercialize electrics. At the 54th Frankfurt International Automobile Show held in September 1991, more than twenty electric car prototypes were displayed by American, Japanese, and European companies. The new era of electrics is beginning, then, around the world.

Firms in Denmark, Sweden, Italy, and France already sell, or are on the verge of selling, electrics at reasonable prices. The French-made Volta, for example, is a lightweight car (1,050 lbs) capable of reaching 45 mph; this two-seater is made in several utility body styles, including van and pick-up, and has a range of 50 miles. Commissioned by the city of Los Angeles to build $7 million in fleet vehicles, Clean Air Transport Svenska, a Swedish firm, is making hybrid vehicles. One model is a compact four-seater with a reinforced plastic body. The on-board, auxiliary gasoline engine can extend the car’s 60-mile range to more than 150 miles, and it has a top speed of about 70 mph.

Unknown to most Americans, several obscure U.S. companies already sell electrics. For example, Solar Electric Engineering of Santa Rosa, California, offers five models, ranging from a converted Ford Escort ($15,700) to the Destiny 2000, a two-seat sports car built on a Pontiac Fiero chassis. The electric Escort, with optional solar panels, reaches highway speeds and has a range of 25-60 miles. Noel Perrin’s charming book, Solo, describes his adventures with a Solar Electric Escort station wagon. His conclusion: it is a superb commuter car but don’t go touring because getting a charge on the road is still difficult. Solar Electric’s Destiny 2000 (Fig. 53) comes in at $28,500, and includes an array of solar cells (which provides a tiny bit of power and extends battery life). With its lightweight fiberglass body, the Destiny 2000 can travel 40 to 60 miles on a charge and cruises at 60-70 mph.

Sebring Auto-Cycle, of Sebring, Florida, manufactures the Zipper, a three-wheeler that runs around $9,000. The Zipper has a top speed of 55 mph and a 50-mile range. Incidentally, Sebring Auto-Cycle and its prede-
cessor companies at the same address have sold more than 4,000 electric cars since 1973.

A third U.S. firm is based in Melbourne, Florida. Solar Car Corporation markets an electrified Ford Festiva for $17,500 and a compact pick-up, based on a Chevrolet/GMC truck, for $19,500. The electric Festiva has a range of 25-60 miles and top speed of 65 mph. Other small U.S. firms are offering, or are soon planning to offer, electric cars or complete electric car kits.

The American companies that pioneered the new electrics have gained much practical experience and have shown that existing technology is adequate for making short-range commuter cars that some Americans will buy. These companies, however, are small, oriented to local markets, and do not advertise nationally in mass media. Thus, they probably will be shoved further into the background as the giants of the auto industry belatedly introduce electrics, later in the 1990s, with a great media blitz. Only the small companies that acquire adequate capital to scale up production and build world-class distribution networks and sales organizations will in any way be prepared for the cutthroat competition ahead.

Many electrics on American streets today are gas guzzlers that have been painstakingly electrified by their owners. Dozens of firms are springing up throughout the nation to do these conversions, which cost around $5,000 to $10,000. Using a several-year-old gas car with a nice body, a “new” electric can be created for much less than $15,000. Conversion kits are available off the shelf from many companies listed in Why Wait for Detroit? (edited by S. McCrea) and in Philip Terpstra’s 1992 Electric Vehicle Directory. Countless electric car clubs also provide advice, and sometimes extra hands, to help out with conversions.

Ordinary Americans can now buy the clean and quiet city car from small U.S. companies or build their own. But they can’t buy one yet from Detroit.

And what plans have the Detroit Three for commercializing the electric? One concern is that the Detroit Three eventually will bail out again, and import the electric cars they will have to sell in the states. In the meantime, however, GM, Ford, and Chrysler have once again established electric car programs. Actually, Chrysler has already released a full-size van with nickel-iron batteries, intended for fleets, selling in the neighborhood of $120,000, and it has brought other expensive vehicles to the prototype stage. Ford also has a full-size van being readied for market and cars in the works. Although

![Image of an electric car](image.png)

**Figure 54.** The Impact, GM’s prototype electric car. (GM Electric Vehicles)

GM is some years away from commercializing an electric vehicle, its prototype automobile has received a great deal of national attention.

In a move that took the automobiling world by surprise, General Motors unveiled, at the Los Angeles Auto Show in 1990, an electric car of stunning appearance and performance (Fig. 54). The car, which has the unfortunate moniker “Impact,” was actually designed by an outside consulting firm, AeroVironment, headed by Paul MacCready. It was MacCready who sired the Gossamer Condor, the first person-powered plane to accomplish controlled flight, and the Sunraycer, GM’s record-breaking solar-powered vehicle. In less than a year, MacCready’s team created far more than the show car commissioned by GM. Designed as an electric from top to bottom, the impressive Impact is powered by lead-acid batteries. The Impact easily cruises at 70 to 100 mph, and its range is claimed to be 120 miles (at lower speeds, of course).

The heavily publicized Impact is having a beneficial effect by dispelling the electric car’s dowdy image. Shaking loose the belief that the electric is but
a slightly reformed golf cart is why the Impact has a high speed—a governor is needed to keep it below 75 mph—and snappy acceleration (0-60 in 8 seconds flat). With its two 57-hp AC motors, at least five times more horsepower than needed for a city car, the Impact is not your father’s (or mother’s) electric. Not only has the Impact shattered the perception that electrics must be slow, but it has been a public relations bonanza for GM as countless magazines and newspapers covered in detail the “revolutionary” electric car. Unfortunately, even if most people wanted an electric that performed almost like a Porsche, they could not afford the Impact at an estimated cost of $20,000–30,000. Although in 1992 GM claimed that it would commercialize the Impact in 1994, by early 1993 the company was backpedaling. It is doubtful that a cash-strapped and wary GM will put the Impact on the market before the end of the decade, if ever.

Is it realistic to expect GM, Chrysler, and Ford to offer inexpensive electric cars to the U.S. public? An obvious implication of the Ford-Edison car project is that we cannot count on a big U.S. automaker to mass-produce a cheap electric. Such a vehicle must always be anomalous, an orphan, in a company geared to the mass-manufacturing of gas-powered cars. The many aborted electric-vehicle projects that these companies have undertaken since the mid-sixties, which mostly produced prototypes of pricey cars, also fuel the pessimistic conclusion that the people’s electric will not roll out of Detroit—at least not right away.

Why the Detroit Three are reluctant to commercialize electric cars affordable to ordinary people is no mystery. Profit is, understandably, the Detroit automakers’ foremost concern; and inexpensive cars, sold in small numbers, do not promise profit. Just as Henry Ford allowed his electric car project to die because he saw no mass market for an inexpensive electric, the Detroit Three will likely stall until convinced—probably by the success of foreign firms later in the decade—that such cars can attract a consumer following beyond a few yuppies and hard-core enthusiasts. GM, Ford, and Chrysler may be the last companies in the world to recognize when the time for the people’s electric has arrived.

If the pricey Impact is actually introduced as promised and finds buyers, GM may expand its offerings, perhaps eventually trickling down electrics to a mass market. Foreign firms, however, are apt to take a more direct route to the masses with a “trickle up” strategy.

In the early 1960s, for example, Japanese firms began to export motorcycles and automobiles to the United States, at first offering only inexpensive subcompacts, much smaller than any car that the Detroit Three built in the United States. Despite jokes at the time that they had been made from recycled American beer cans, the imports sold by the millions in the 1960s and 1970s because they were inexpensive, well made, and fit with the lifestyles of many young Americans. Building on these successes, Japanese automakers developed technology to move to larger, more powerful cars in the 1970s and 1980s. Today, of course, these companies are selling luxury cars, often to the same loyal customers who bought their subcompacts in the sixties.

In a spasm of wishful thinking, the Detroit Three believe they now enjoy a lead in electric car technology over their foreign rivals, and so will be able to stave off, with better-performing cars, competitors that employ a trickle-up strategy. To maintain their supposed technological advantage, the Detroit Three have embarked on an unprecedented joint project targeted at what many people believe is the electric car’s weak link: the battery.

In the fall of 1991, GM, Ford, and Chrysler announced that they had created, with the blessings of the federal government, the U.S. Advanced Battery Consortium to improve electric vehicle batteries. On the surface, this surprising and well publicized act signals that the Detroit Three are in the vanguard of efforts to commercialize the electric car. Drawing on an earlier campaign to make better batteries, we can subject the current project to closer scrutiny, seeking other meanings.

Thomas Edison’s public proclamations in 1901 that he was working on a better battery for electric cars—and that it was almost ready for release—simultaneously sent several messages to would-be car buyers. The most transparent meaning was that Edison had committed his considerable energies and resources to perfecting the electric car, the Wizard had faith in its future. Another message, much less obvious at first, stemmed from Edison’s identification of the battery as the bottleneck holding back electric vehicles. Americans no doubt concluded that the battery problem was not trivial if Thomas Edison had taken it up; and, evidently, the electric car could not achieve practicality until that bottleneck was removed. With Edison hard at work on a new battery, however, the electric’s future might soon be bright.

In the meantime, which lasted from 1901 to 1909, people lost patience waiting for the Wizard’s new battery and bought gasoline cars. The irony is
that throughout the entire period that Edison labored on nickel-iron technology, lead-acid batteries were being used to power eminently serviceable electrics.

This historical case allows us to appreciate what publicity about the battery consortium is really telling most Americans: good batteries for electric cars are not yet at hand, and are probably a long way off. A typical assessment was included in an otherwise upbeat article on electric cars, published in March 1992, in The New York Times Magazine:

batteries have a long way to go. In fact the phrase most used about batteries is “the Achilles’ heel of the electric car.” Right now, they provide too limited a range, take too long to recharge and have too short a life to make electrics fully competitive in cost and performance with gasoline cars.

This misleading statement would cause most readers to conclude that commercializing the electric car today would be premature. As in Edison’s day, however, building a serviceable electric car does not require a battery breakthrough. As we have seen, commuter electrics with a range of 25 to 60 miles are on the market already.

When placed into historical perspective, faith in the imminent appearance of a revolutionary storage battery, capable of giving electrics the same performance characteristics as gasoline cars, seems misplaced. Nearly every year during the twentieth century inventors announced breakthroughs in storage batteries. With only the rarest exception, these inventions have not been successfully commercialized, for all have drawbacks in purchase price, performance, maintenance costs, life expectancy, recyclability, or safety. Tellingly, the three main storage battery systems important today, lead-acid, nickel-iron, and nickel-cadmium, were all developed before 1910. Nickel-iron and nickel-cadmium batteries can power electric cars, but they are expensive (at least $6,000 and $25,000, respectively). “Advanced” battery systems, such as sodium-sulfur, zinc-air, and zinc-bromine, have been worked on for decades, and more decades may pass before any are ready for the people’s electric. As Michael J. Riezenman observed recently, in an issue of IEEE Spectrum featuring electric vehicles, “no dramatic improvements in . . . batteries are expected soon.”

Although no breakthrough batteries are on the horizon, one new battery—the nickel metal hydride—is likely to be improving the performance of electric cars before the end of the century. Ironically, the new battery is a distant technological descendant of Edison’s nickel-iron battery. Developed by scientists at Energy Conversion Devices of Troy, Michigan, the battery is an alkaline system with an electrolyte of potassium hydroxide (and a trace of lithium hydroxide). The positive electrode is sintered nickel, while the negative is a powdered metal alloy, fabricated by processes unknown in Edison’s time. Already commercialized for laptop computers and cellular phones, the nickel metal hydride battery is being adapted for electric vehicle applications with generous funding from the U.S. Advanced Battery Consortium.

With an energy density at least twice that of lead-acid, the new battery should give present-day electric cars a range of 50 to 120 miles. The battery can be easily boosted—a 60 percent recharge in 15 minutes, a full charge in less than an hour. Significantly, the battery is expected to last ten years, which will more than make up for its high price, an estimated $4,000–5,000. Best of all, the nickel metal hydride battery is a sealed system, requiring no maintenance. Commercial production of the new battery for electric vehicles is likely to be underway by 1997.

Because of the higher upfront cost of the nickel metal hydride battery (like the Edison battery), there will still be a substantial market for improved lead-acid batteries for electric vehicles. One design, now in the testing stage, shows considerable promise. Developed by Electrosourse, Inc. of Austin, Texas, the Horizon battery departs from traditional lead-acid batteries in virtually every feature, from a woven positive electrode to horizontal stacking of plates. Despite its radical design, the Horizon battery lends itself to continuous-flow manufacture processes, and should be comparable in cost to conventional lead-acid batteries. Happily, the Horizon battery is expected to double the electric car’s range while also accepting boosts.

Somewhat better batteries are clearly in the electric car’s immediate future, but for the rest of this century, at least, electrics will not have the range of a gasoline car.

As in earlier times, public discussion of the electric car’s future has been unduly influenced by what I have called the “better battery bugaboo” because the media naturally air the opinions of technical people. The comments of these “experts” betray a poor understanding of the larger social and cultural contexts in which they work. A product regarded by the technical community as “perfected” may be a flop with consumers, and products judged technically
imperfect may still enjoy healthy sales and a high level of consumer satisfaction. The electric car of 1912, though ideal for city use, could not be afforded by the middle-class women who made up its largest potential market. It failed to reach these consumers for social and cultural—not technological—reasons. Thus, discussions must now focus on factors, apart from the vehicle and its batteries, that in the end will determine the electric car’s destiny.

It is clear that, by the late 1990s, showrooms across America will be offering a surprisingly varied selection of electric cars made in Europe, the Pacific Rim, and America. Even so, executives at the Detroit Three, as well as sundry industry pundits, are concerned that the anticipated demand for such vehicles might not actually appear. In their darkest dreams, Detroit bean counters visualize unsold electrics stretching as far as the eye can see. Will the electric car in fact find a market beyond Sun Belt retirees and California yuppies? To answer this question, we must think about the relationships that ordinary Americans may come to have with electric cars in the years ahead.

During the past three decades, while the Detroit Three have been coping so ineptly with the inroads made by imports, America has been undergoing profound cultural changes that work in favor of the adoption of electric cars. Perhaps Detroit’s aging auto executives should be reminded of their predecessors’ once-fervent belief, aired in the fifties and sixties with great authority, that “Americans will never buy small cars.” Having grown up comfortably with gas hogs, most senior citizens of that time did detest miniscule motor cars, but members of younger generations turned to them with gusto. Supplied mainly by foreign firms, small cars found important places in the lives of tens of millions of ordinary Americans. Now, new generations of Americans with different social needs, attitudes, and lifestyle expectations have reached car-buying age; many of these people are apt to regard the electric car as something quite desirable—at least in principle.

In many textbooks and curricula in elementary and secondary schools, colleges, and universities, a strong environmental emphasis has taken root since the sixties. Beginning with the baby boomers, generations of urban Americans have grown up green, hoping one day to be able to buy nonpolluting automobiles. Not every American born since World War II has an acute environmental awareness, of course, but national polls indicate that tens of millions do. These are the people most likely to consider seriously buying an electric car because it reduces smog in cities, emits no greenhouse gases, and lessens U.S. dependence on foreign oil. Being a green technology, however, is insufficient to ensure the electric car’s widespread adoption. Potential middle-class purchasers must also judge the electric car compatible with their lifestyles.

Today, the lifestyle of many ordinary Americans includes taking long trips by car. Thus, some argue, success will elude the electric until it can tour. Let us place this issue into historical perspective.

Over the decades, touring has been a moving target for electrics; and they are no closer to hitting it now than they were in 1900. Electric cars of the Classic Age did have a touring capability of a sort. Traveling 50 to 100 miles on a single charge and reaching speeds of 25 mph or more, an electric roadster of 1912 would have been a very fine touring car—in 1900. In the passage of that dozen years, however, performance requirements of the touring car, plaything of wealthy men, had changed dramatically. The touring car of the teens had to achieve speeds of 40-60 mph and travel more than 200 miles a day. No electric came close. During the many decades following the Classic Age, the performance requirements of the touring car became even more demanding. A vacation-worthy vehicle now must cruise the highways at 70-plus mph and go 500 or 600 miles in a day. Needless to say, electric cars still cannot tour.

Advocates of the touring electric of the future pin their hopes on two lines of technological development. The first, of course, is the better battery. Better is too mild a term, for miraculous would be the battery that could bestow upon electrics a 500-mile range. While not inconceivable sometime well into the next century, such a breakthrough is, as already noted, most improbable in the next decade or two.

A second avenue to the touring electric is through creation of an appropriate infrastructure, such as depots along highways for rapid battery exchanges and trolley-like operation on interstates. Many of these ideas, of course, date back to the first era of electrics. As New York’s electric cabs and Milburn cars demonstrated, rapid battery exchanges are technically feasible. A workable system today would entail large, mechanized exchanges at no more than 15-mile intervals along all interstates (and in all towns). Building such a system obviously would require vast amounts of capital. That electric cars can operate in a trolley-like fashion was shown in 1897 by W. G. Caffrey, of Reno, Nevada, whose handiwork was favorably reported in Horseless Age. Recent experiments have attempted to use connections to the roadbed. When appropriate modern technology is perfected, the problem of paying for highway
modifications will have to be faced. My hunch is that public utilities, battery companies, and state and federal governments will be reluctant to build an infrastructure for touring until electric vehicles are decidedly common, which may not be until the first decade of the next century.

In the most optimistic scenario, however, the continued expansion of air travel may eventually make the touring function obsolete for most family cars. Already, wealthy Americans fly to their travel destinations and rent cars. Still others rent cars at home for weekend travel and vacations. D. C. Tiffany of Boston set an interesting example in 1913. Owner of only an electric, he rented a gasoline touring car for long trips. In the not-too-distant future, perhaps the buyer of an electric car will receive a book of coupons redeemable for 10-30 days of car rental per year. This would be far more economical than maintaining a gas guzzler just for the occasional trip out of town.

Like the better battery bugaboo, the touring electric chimera will be employed by the electric car's enemies (and a few friends) to foster unrealistic expectations about electric car performance. Detractors and misguided advocates will burden the electric with the need to wait for technological breakthroughs that may never come. The touring electric chimera will gradually fade, however, as people discover that the electric has finally found its own "sphere of action" on the streets of American cities. Though it cannot tour, the electric will be gradually adopted as an economical and socially appropriate commuter car.

That the electric is economical will become more generally known in the years ahead. Many people familiar with today's electrics insist that operation and maintenance costs are already lower than those of gasoline cars. Such evaluations include the replacement of an entire set of batteries, perhaps every four years (happily, lead-acid batteries are completely recyclable). However, abstract calculations in the technical literature, divorced from real people using real electric cars, do not consistently give the electric an economic advantage yet. When the Horizon and nickel metal hydride batteries become available, however, the electric car is expected to achieve a decisive economic edge.

Even if the electric car is not now cheaper to operate, it is much easier to maintain: no oil changes, no tuneups, no radiator flushes, and no broken belts or hoses. An electric's upkeep merely requires occasional lubrication of a few points, regular checks of water levels in the batteries, and periodic washing of the battery cases. DC motors also need additional but infrequent main-
tenance. People who hate the aggravations of gasoline car ownership, from breakdowns at the worst possible time to the terrors of emissions testing, will come to view the simple and reliable electric as a pleasant alternative.

To enhance the economic attractiveness of electric cars and so hasten their spread, public utilities as well as local, state, and federal governments are providing (or will soon provide) financial incentives. For example, public utilities are beginning to offer discounts to users of off-peak current who charge vehicle batteries. A few states heavily discount registration fees for electric vehicles; in Arizona, for example, it costs only $5 to register an electric car. In California, a generous tax credit is given to electric car purchasers. In addition, pollution taxes on gasoline vehicles, state and federal tax credits for buying an electric, and higher gasoline taxes are in place or in the immediate offering. In the year 2000, it is doubtful that gasoline in America will still be cheaper than bottled water.

The electric city car's utilitarian function is necessarily confined to commuting and running errands in town. Will ordinary Americans, spoiled by the unfettered freedom they have enjoyed with gasoline cars, perceive the electric as a capable city vehicle?

In the Classic Age city speed limits were low, and so the electric with a single charge could be driven all day long. Wealthy women like Mina Edison and Clara Ford enjoyed the ultimate in personal, mechanized mobility. Since the Classic Age, however, demands on the city car have greatly increased. In southern California, for example, commutes to work of 30 to 50 miles each way are common, while those of 50 to 80 miles are by no means unheard of. Southern California, of course, furnishes extreme examples; the majority of round-trip urban commutes clearly fall within the range of the electrics that can be bought today.

Electric car proponents never tire of pointing out that an electric with a range of 25 to 60 miles is an adequate city car for most people. What they ignore is the single most important lesson that the history of the early electric vehicle teaches us: the choice of a car technology is influenced by the extreme, not the average, anticipated use. Middle-class Americans in the teens flocked to the gasoline car, even though electrics could meet all of their urban transportation needs, because they anticipated touring every once in a while. In the showroom, today and tomorrow, ordinary Americans will not be thinking about the 20-mile trek back and forth to work each day, but about those few uncommon occasions—retrieving a sick child from school, shop-
ping for a birthday gift at lunch, getting a root canal—when an extra-long range is essential.

Keeping this decision-making criterion in mind, we can predict that only people who live in compact towns and tiny cities, as well as those whose commutes in sprawling metropolitan areas are very short, will judge the 50-mile electric adequate for their needs. Although that group furnishes a sizable market for the people’s electric, far more Americans will regard use of an electric car as too risky. Many of the latter will change their minds, later in the decade, as electric cars with ranges of 75 to 150 miles become available. The most mobile urbanites, who anticipate a maximum daily range of 100 to 200 miles, may still not find electrics appealing. These last holdouts, however, may be won over by hybrid vehicles carrying a small gasoline or diesel engine, much like the Woods gasoline-electric coupé of 1916.

A more general solution to the range problem will be found in furnishing the means for easy recharging of batteries away from home during the day. In California, some employers already provide outlets in their parking lots so that owners of electric cars can plug in at work. Predictably, the “electrant,” a coin-operated charging hydrant designed at the turn of the century for installation along city streets, has already been reinvented and updated. When they come on line, later in the decade, electrants will probably be called charging meters. These meters doubtless will be operated by the insertion of a credit card, with rates that vary by time of day.

As in the first age of electrics, power companies will be slow to establish an infrastructure for charging outside the home. When electric cars become more common, however, public utilities wishing to project an image of environmental concern (and municipalities desiring to proclaim their modernity) will jump on the charging-meter bandwagon and subsidize their installation. In the most optimistic scenario, by early in the next century fields of charging meters will spring up in a sizable number of public and private parking lots and along streets in electric-friendly towns and cities. Although most commuters would do their charging overnight at home, the proliferation of charging meters (and special stations for boosting) will give all electric car owners an extra margin of security. The sense of well-being that comes from knowing that a change—just like gasoline—is available nearly anywhere will remove an important impediment to the adoption of the electric car.

The spread of electric cars will also be accelerated by nonutilitarian fac-

ors. Americans are always eager to use cars for displaying their wealth and special expertise, and this social need will find expression in electrics. Indeed, the electric lends itself perfectly to a variety of high-tech accessories. For example, the yuppie version of the electric car will not be complete without large panels of solar cells, cellular phone, 400-watt stereo with tape deck and CD player, world-band radio, CB transceiver, facsimile machine, back-looking radar, and burglar alarm. The upscale buyer will also be offered a horn that puts out a variety of sounds and songs, and “smart” windshields that get darker during bright sunlight. The pièce de résistance will be a real-time video display of the car’s precise location on a city map using the Global Positioning System, a satellite technology.

The electric car will also come to be regarded as a desirable symbol of widely shared values and beliefs. Carrying the cachet of modernity, it will mean freedom from dependence on foreign oil, a sentiment supported by Americans across the political spectrum. And, of course, because the total pollution (on a per mile basis) contributed by electric cars and the power plants that charge their batteries is less than that emitted by cars burning hydrocarbons, Americans will employ the electric as a mobile billboard to announce their concern for the earth’s well-being. Small wonder that many of today’s electric owners prominently paint the word “electric” on their cars.

Although no one can be certain that a huge mass market awaits the electric car, there are ample grounds for believing that the people’s electric will not languish in showrooms. At least some industry observers now agree that, as the environmentally friendly city car, electrics will find at least a modest mass market. Even Motor Trend has recently acknowledged that electric cars, “as non-polluting secondary vehicles used for a daily 50-mile commute, just might be the ticket.” When inexpensive commuter electrics become more common later in the nineties, owners will tout their virtues to friends. Impressed, the latter will buy their own, and so on; inexorably electrics will gain a foothold in the cities of America. Unlike their ancestors, electric cars of the modern era will not be a spectacular flop.

The electric car’s time has clearly come. Not only does the technology for making inexpensive electrics exist today, but in cities there is an adequate and easily improved infrastructure for charging. And, significantly, the electric city car is ideologically perfect for an age seemingly obsessed with the environment. By early in the next century the electric’s success in this realm
seems highly probable. Even with no breakthroughs in technology, it is possible to envision the eventual replacement of most family cars with electrics. The main question mark that remains is which companies—the Detroit Three, today’s U.S. makers of electrics, or foreign firms—will be the big winners in the marketplace. Regardless of corporate winners and losers, ordinary Americans will at last be buying, in more than token numbers, a vehicle that has been for nearly a century the car of the future.

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