

Oil for Living: Petroleum and American Conspicuous Consumption

Brian C. Black

... the hierarchy of substances is abolished; a single one replaces them all; the whole world *can* be plasticized.

—Roland Barthes, *Mythologies*, 1957

Americans proudly streamed to the 1939 World's Fair in New York City as World War II flared on the other side of the Atlantic. Not yet part of the conflict, Americans used the opportunity to escape the present and wax utopian. Although the dreams on display took many forms, they were woven together by an invisible hand—more specifically, by a basic assumption—concealed within each of the fair's scenes: bountiful supplies of cheap energy.

The novelist E. L. Doctorow provides one of the most revealing descriptions of one of the fair's best-known attractions:

We rode across the Bridge of Wheels and got out, of course, at the General Motors Building. That was everyone's first stop. . . . In front of us a whole world lit up, as if we were flying over it, the most fantastic sight I had ever seen, an entire city of the future, with skyscrapers and fourteen-lane highways, real little cars moving on them at different speeds, the center for the higher speeds, the lanes on the edge for the lower. . . . This miniature world demonstrated how everything was planned. . . . It was a toy that any child in the world would want to own. You could play with it forever . . . it was a model world.

Inside General Motors' Futurama, five million visitors rode on the "Magic Motorways" exhibit, designed by Norman Bel Geddes, that led to the "Town of Tomorrow." Details of reality—such as grocery stores and gas stations—were left out of the vision, but the nation was abuzz with the futuristic marvels such as flying sedans found on the model expressways of Ford's "Road of Tomorrow."¹ Although that dream world possessed iconic aspects that resonated for generations, its greatest appeal may have been its vision of a world in which basic aspects of everyday life occurred easily—requiring neither care nor attention. With their basic needs met, humans might occupy themselves with greater challenges or endless diversion.

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¹ E. L. Doctorow, *World's Fair* (New York, 1985), 252–53. Jeffrey L. Meikle, *Twentieth Century Limited: Industrial Design in America, 1925–1939* (Philadelphia, 1979), 200–209. For more on the 1939 World's Fair in New York City, see Robert W. Rydell and Laura Burd Schiavo, eds., *Designing Tomorrow: America's World's Fairs of the 1930s* (New Haven, 2010).

Even though automobiles have, for the most part, remained grounded, many other details of that futuristic landscape materialized. The remarkable accomplishments that shaped everyday American life after World War II have many common threads that bind them together, but perhaps none is as central as petroleum. Measured in terms of quadrillion BTUs (British thermal units), which is the basis for charting energy consumption, U.S. consumption of petroleum rose from less than ten after 1945 to twenty in 1960, forty in 1975, and over forty after 2000. It was approximately 1950 when petroleum overtook coal as the nation's leading energy producer, and today the rate of petroleum consumption ranks approximately double its nearest competitors, coal and natural gas. Although the nation passed through different eras in the commodity's centrality, petroleum's ongoing predominance in American life after 1945 demands new terminology. The inculcation is so dramatic that Americans during the postwar era can be said to exist within an ecology of oil.²

When the French philosopher Roland Barthes sought to condemn the overconsumption and superficiality of the modern era, his symbol was the substance of many forms—plastic. Similar to the people that he condemns, Barthes overlooks the raw material that made possible the iconic plastic.³ Before Americans could have the hula hoops and Twinkies that helped define the postwar era, there had to be a prodigious and reliable supply of crude oil. The best evidence of twentieth-century Americans' overwhelming dependence on petroleum may be that they have completely neglected to give it proper credit for enabling the nation's overall high standard of living. Even now, most Americans barely get past an elementary-level understanding of their dependence on oil. Oil does not just fuel Americans' vehicles. Oil has changed their diet, their clothes, their neighborhoods, their jobs, their fun—in fact, everything about U.S. society. Although Americans continue this profound reliance today, the nation's culture of crude has begun to shift in dramatic ways.

Taken for granted for decades, the flow of surplus crude came to a sudden halt during the 1970s when increasing imports converged with political limitations. As abundance turns to scarcity in the second decade of the twenty-first century, the American ecology of oil has come to include concepts such as *resource wars*, *peak oil*, *petro-dictators*, and *bottom kill*. This increasing appreciation of petroleum's importance and the complexity of acquiring it demands that we also revise our historical narratives—that we acknowledge the hidden hand (or nozzle) when it was most essential to American life and history.⁴ This brief essay

² "Figure 5. Primary Energy Consumption by Source, 1775–2009," in *Annual Energy Review 2009*, by U.S. Energy Information Administration (Washington, 2010), xx. Myrna I. Santiago uses the term "ecology of oil" to describe the wholesale changes that developing crude meant to the lives of native inhabitants in her work about Mexico. See Myrna I. Santiago, *The Ecology of Oil: Environment, Labor, and the Mexican Revolution, 1900–1938* (Cambridge, Eng., 2006).

³ Roland Barthes, *Mythologies*, trans. Annette Lavers (New York, 1972), 97–99. This book was originally published in French in 1957.

⁴ On the factors relating to the 1970s oil crisis, see, for instance, Daniel Yergin, *The Prize: The Epic Quest for Oil, Money, and Power* (New York, 1991); Karen R. Merrill, *The Oil Crisis of 1973–1974: A Brief History with Documents* (New York, 2007); and Daniel Horowitz, *Jimmy Carter and the Energy Crisis of the 1970s: The "Crisis of Confidence" Speech of July 15, 1979; A Brief History with Documents* (New York, 2004). On American reaction to energy transition after the 1970s crisis, see David E. Nye, *Consuming Power: A Social History of American Energies* (Boston, 1998); Michael T. Klare, *Resource Wars: The New Landscape of Global Conflict* (New York, 2001); Kenneth S. Deffeyes, *Hubert's Peak: The Impending World Oil Shortage* (Princeton, 2008); Paul Roberts, *The End of Oil: On the Edge of a Perilous New World* (New York, 2005); and Thomas L. Friedman, *Hot, Flat, and Crowded: Why We Need a Green Revolution—and How It Can Renew America* (New York, 2008). For efforts by historians to include energy and petroleum in the historical narrative, see Alfred W. Crosby, *Children of the Sun: A History of Humanity's Unappeasable Appetite for Energy* (New York, 2006); and J. R. McNeill, *Something New under the Sun: An Environmental History of the Twentieth-Century World* (New York, 2000). For works by journalists who have told portions of this story, see Peter Maass, *Crude World: The Violent Twilight of Oil* (New York, 2009); Lisa Margonelli, *Oil on the Brain: Adventures from the Pump to the Pipeline* (New York, 2008); and Roberts, *End of Oil*.

deconstructs the trope of American mass consumption after World War II to reveal two of its primary elements functioning symbiotically: consumer passion and cheap crude. From the Big Mac to Tupperware's burping bowl, petroleum provided the raw material for much of what defined consumption in postwar America.

Conspicuously Consuming Crude

In Futurama, science fiction-like visions merged with the ideas of intellectuals such as Lewis Mumford to take concrete form. Modernism was no longer an artistic genre restricted to the few; now, modernist design and "the new" were the stuff of the middle class. Consumer expectations—such as those shaped by the scene of Futurama—became a primary engine behind radical shifts in patterns of American living. The transformation of living patterns after World War II was so dramatic that historians have given it a name: "mass consumption." Lizabeth Cohen and other historians have demonstrated that the motivations that drove consumers and filled out the middle class were fed by the policies and politics of the Cold War.⁵ But the factor behind the scenes that enabled this dramatic change has yet to be fully appreciated by historians.

In her work, Cohen reaches back to Thorstein Veblen's *The Theory of the Leisure Class* (1899), in which he developed the idea of "conspicuous consumption," to describe the power of social emulation expressed through extravagant display, particularly in the American model of capitalist society. Consumable items, in such a paradigm, can function as symbols of affluence that spur citizens to increase their economic standing. Similar arguments were made in other well-known critiques of postwar America such as David Riesman's *The Lonely Crowd* (1950), David Potter's *People of Plenty* (1954), and John Kenneth Galbraith's *The Affluent Society* (1958). Although in each case scholars ultimately criticized American emphasis on consumption, there was clear agreement that the overriding priority in America of this era was the freedom to purchase goods that fleshed out a life-style that today we refer to as *middle class*. A society with affordable products and consumers with discretionary income to spend became primary components of the "affluence" that defined the American standard of living after World War II. Despite its implication for ideas of race, gender, and youth—not to mention of home design and the overall construction of the human habitat—mass consumption became a symbol of American success in the Cold War. Although scholars such as Cohen argue that many of these details grew from basic policies, such as the G.I. Bill, we must also ascribe credit to the lifeblood of the affluent society that took shape after World War II: cheap energy, primarily petroleum. Even more important, the scope of the affluence that oil enabled made this higher standard of living the new normal, eventually making consumption no longer conspicuous.⁶

⁵ On Lewis Mumford and other modernist intellectuals of this era, see Meikle, *Twentieth Century Limited*, 135, 180. Lewis Mumford, *Technics and Civilization* (1934; Chicago, 1963), 357–58. For general studies of modernism and consumption, see, for example, Gary Cross, *An All-Consuming Century: Why Commercialism Won in Modern America* (New York, 2000); and Terry Smith, *Making the Modern: Industry, Art, and Design in America* (Chicago, 1993). Lizabeth Cohen, *A Consumers' Republic: The Politics of Mass Consumption in Postwar America* (New York, 2003), 10–12.

⁶ Thorstein Veblen, *The Theory of the Leisure Class: An Economic Study of Institutions* (New York, 1899); David Riesman, *The Lonely Crowd: A Study of the Changing American Character* (New Haven, 1950); David Potter, *People of Plenty: Economic Abundance and the American Character* (Chicago, 1954); John Kenneth Galbraith, *The Affluent Society* (Boston, 1958).

In *People of Plenty*, Potter sought to analyze this society by expanding our conceptions of what is included in a society's "culture." By including everyday patterns and habits associated with America's experience with mass consumption, for instance, these details could be seen as part of larger level social patterns, including efforts to stimulate unity or, contradictorily, exclusion. As a unifier, this emerging culture helped overcome class distinctions and cleared the way for one, predominant middle class. With this pattern in mind, theorists have constructed a critique of consumption as a homogenizing force. Barthes, however, decried the loss of meaning and depth with such flexibility and, by the end of the twentieth century, other scholars had joined the fray. For instance, the sociologist George Ritzer and others railed against the McDonaldization (or Walmartization) of American life that took away distinct, individualized opportunities for consumption and replaced them with standardized, less personal options. Other scholars, alternatively, suggest that although the disposable society has many shortcomings, by making prosperity and comfort so accessible, it may also represent the most democratic culture that American society has thus far produced.⁷ Regardless of its ultimate meaning for Americans, mass consumption, scholars agree, had made the U.S. standard of living after World War II a symbol of U.S. prosperity. Unseen in many of these consumer items, unrecognizable in its finished form, the alchemy of gallons upon gallons of cheap crude played a defining role.

So where does petroleum fit into the historical paradigm of post-World War II consumerism? Certainly, it was a critical cog in the engine that drove this consumptive society. Can one go one step further, in an era enabled by cheap petroleum, to argue that "black gold" has functioned as a democratizing element in American life? Big Oil has wrought mighty evils on societies all over the world and also on the natural environment; however, for the society that inculcated it more completely than any other, there is clear evidence that cheap oil empowered the middle class and helped the United States attain the world's greatest standard of living by, not least of all, helping Americans overcome very basic limits on the human condition. Our histories must accept this premise so that scholars might unravel the larger environmental, social, and cultural implications of our high-energy existence.

Petroleum Makes Consumption Less Conspicuous

As consumption became less conspicuous or exceptional after World War II, transportation became the preeminent example of the new ecology of oil. The use of human and animal power, the essential ways that humans had moved about, had remained fairly static for centuries. By the early 1900s, automated methods of transportation (powered by biofuels, gasoline, steam, or electricity) had become widely available. Fuel and vehicle prices made such options primarily available only to wealthy consumers. With few roads or conveniences, a drive in such a vehicle during the 1910s was almost purely a luxury. Local and state governments worked to make auto travel easier and more convenient, and

⁷ "Traditionally, 'culture' had meant a collection of artifacts, actually or potentially on show in a museum," wrote David Potter. "But in very recent decades, it has come to mean a collection of customs, a series of habits." See Potter, *People of Plenty*, 35, 42. See also George Ritzer, *The McDonaldization of Society* (Thousand Oaks, 2004). Lizabeth Cohen has demonstrated that some of these developments have offered women and minority consumer groups, including African Americans, the opportunity to express and achieve social status from which they were previously excluded. Cohen, *Consumers' Republic*, 194–96.

entrepreneurs such as Henry Ford brought vehicle prices down to a level at which mass consumers became drivers. Seen as a societal good, driving became an emphasis of federal funding after World War II. Tax breaks and zoning regulations all spurred America's shift toward becoming a real-life version of Futurama. None of this mattered, though, if fuel was too costly for most consumers. Therefore, federal authority also maintained remarkably low gasoline prices—ensuring that the fuel became accessible to almost everyone. With this widespread access to modes of transportation, the landscape of consumption took shape after World War II.⁸

Suburbs, as Adam Rome portrays in *The Bulldozer in the Countryside*, were the anchors of the corridors of commerce for the new, postwar America. In those model environments, developers dropped housing tracts in outlying areas where real estate prices were low. Often, these suburbs first appeared marooned from essential services—a sort of man-made frontier when services were still predominantly located in cities (and many of these services, such as grocery stores, soda fountains, and Automat restaurants, had become quite advanced in their ability to deliver a variety of products reliably and rapidly). Recalibrating the human habitat for automobility remade the American landscape after World War II. Between suburban homes and urban workplaces the economic frontier of the postwar era emerged. Of one component of the new sprawl, the historian Catherine Gudis writes: “With every coming year, automobiles could be found in more and more places, thus expanding the marketing frontier and potential location of billboard spaces to areas heretofore untouched.” To manage these new corridors of consumption, an industry soon took shape, led by the trade organization Outdoor Advertising Association of America (OAAA), which proclaimed in its motto: “we have changed from essentially a ‘home people’ to an ‘automobile . . . people.’”⁹

In its various forms, petroleum enabled humans to overcome limits, particularly those of time and space. Potter discussed American expansion and restlessness in this fashion: “The man best qualified for this role was the completely mobile man, moving freely from one locality to the next, from one economic position to another, or from one social level to levels above.”¹⁰ In addition to ensuring physical movement, petroleum helped bring Americans economic and social mobility through mass consumption. Along with new information technologies and advancements in production capabilities, petroleum became a primary component in allowing producers to overcome limits of supply and production. That success then allowed for massive growth in the scale of production and, ultimately, in mass production, which brought prices down and made a whole world of products and services available to middle-class American consumers.

Possibly the longest trope in the study of American culture had been to view the push and pull of technology against agriculture and, by extension, nature. In such a paradigm,

⁸ Clay McShane and Joel A. Tarr, *The Horse in the City: Living Machines in the Nineteenth Century* (Baltimore, 2007); Douglas Brinkley, *Wheels for the World: Henry Ford, His Company, and a Century of Progress, 1903–2003* (New York, 2003); David A. Kirsch, *The Electric Vehicle and the Burden of History* (New Brunswick, 2000); Edwin Black, *Internal Combustion: How Corporations and Governments Addicted the World to Oil and Denied the Alternatives* (New York, 2006). Christopher W. Wells, “Fueling the Boom: Gasoline Taxes, Invisibility, and the Growth of the American Highway Infrastructure, 1919–1956,” *Journal of American History*, 99 (June 2012), 72–81.

⁹ Adam Rome, *The Bulldozer in the Countryside: Suburban Sprawl and the Rise of American Environmentalism* (New York, 2001). Owen D. Gutfreund, *Twentieth-Century Sprawl: Highways and the Reshaping of the American Landscape* (New York, 2004); Dolores Hayden, *A Field Guide to Sprawl* (New York, 2004). Catherine Gudis, *Billboards, Automobiles, and the American Landscape* (New York, 2004), 39, 49.

¹⁰ Potter, *People of Plenty*, 96.

technology was a “counterforce” against which Americans struggled to retain certain aspects of their original culture. As mass purchasers of goods and services, Americans no longer viewed such innovations and economic development as a “counterforce” in American life; instead, new technologies became inculcated into revamped life-styles. This modern sensibility of working cooperatively with technologies, such as the internal combustion engine, was captured by Lewis Mumford when he described the machine as a force that “simplifies the environment.” He explained:

As a practical instrument, the machine has enormously complicated the environment. . . . [But] without standardization, without repetition, without the neutralizing effect of habit, our mechanical environment might well, by reason of its tempo and its continuous impact, be too formidable. . . . The machine has thus, in its aesthetic manifestations, something of the same effect that a conventional code of manners has in social intercourse: it removes the strain of contact and adjustment . . . it permits intercourse between persons and groups to take place without the preliminary exploration and understanding that are requisite for an ultimate adjustment.

Mass consumption was the product of Americans internalizing the machine and domesticating it. During the Cold War era, technology was accepted as key to the nation’s progress and also to keeping the Soviet Union at bay. This aesthetic was fueled by large-scale economic and social changes as well. Cohen describes this trend as the construction of a “consumer’s republic” in which consumption was construed as an expression of national identity and even patriotism. She traces the emergence of “a new postwar ideal of the purchaser as citizen who simultaneously fulfilled personal desire and civic obligation by consuming.”¹¹

The key to this technical society—its essential element—was crude oil available at an average per-barrel price of \$22–23 (in 2008 dollars) from 1869 to the present. From 1945–1970 the per-barrel price remained below \$20, and U.S. society poured a cultural and social foundation that was, in hindsight, based on the assumption that Americans would always have a perpetual supply of petroleum at a stable price. Of course, things changed dramatically by the end of the twentieth century—by 2007–2008 the per-barrel price reached an all-time high of \$145.¹² The availability of inexpensive crude persuaded American society to organize itself into an ecology of oil in which basic human needs—such as acquiring food—became reliant on crude.

Fast food is the obvious link between petroleum-powered transportation and the human need to acquire the calories that our bodies require—what scholars refer to as American foodways. This new method of foraging involved innovations such as that of Maurice McDonald and Richard McDonald when they intentionally located their McDonald’s just off Route 66 in San Bernadino, California. Ray Kroc, a milkshake-machine salesman, then expanded that form on a massive scale.¹³ From White Castle to

¹¹ Mumford, *Technics and Civilization*, esp. 357–58. For discussion of these general points, see Thomas P. Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm, 1870–1970* (New York, 1989). Cohen, *Consumers’ Republic*, 119.

¹² For pricing data, see “Oil Price History and Analysis,” *WTRG Economics*, <http://www.wtrg.com/prices.htm>. After the 2007–2008 peak, crude oil prices dropped dramatically. Analysts suggest this was due to the global economic difficulty in 2008–2009. In 2011 prices began to rise again and most analysts agree that they will likely return to 2007 levels as a “new reality” or baseline in crude pricing. Peter Maass, *Crude World: The Violent Twilight of Oil* (New York, 2009), 5–8; Daniel Yergin, *The Quest: Energy, Security, and the Remaking of the Modern World* (New York, 2011), 6–10. For more historical data, see “Petroleum and Other Liquids,” *U.S. Energy Information Administration*, <http://www.eia.gov/petroleum/>.

¹³ There are a number of sources that nicely capture portions of the automobile’s extension into changes in American life. For one of the most useful, see James J. Flink, *The Automobile Age* (Boston, 1988).

Royce Hailey's Pig Stand, burger joints, tea houses, diners, and, eventually, strip malls defined sprawl as the new American consumer environment.

Petroleum, however, was impacting Americans' food consumption through more than their reliance on automobiles; a more insidious change is symbolized by the seemingly innocent Twinkie. Although this sweet snack seems at first simple, it is actually a high-tech piece of complex chemistry, manufacturing, and distribution with no fewer than thirty-nine ingredients (most of which were also first manufactured).¹⁴ Food production in the twentieth century, epitomized by the lusciously nutritionally void Twinkie, was characterized by efforts to simplify and streamline crop growing and processing by supplementing and embellishing those steps with the use of cheap resources such as petroleum.

Chemists played an important role in using petroleum to expand, simplify, and, at times, enhance the food that appeared in American shopping carts. Often with petroleum hydrocarbons as a basis or active ingredient, chemicals were created to control problems associated with agriculture, including managing weeds and pests (through herbicides and pesticides). Most important to the twentieth century, though, chemists also used petroleum and natural gas to create heat that manufactured and "fixed" synthetic nitrogen to enhance growing potential. The Haber-Bosch process alone increased the food production capabilities of nations throughout the world. This method for manufacturing synthetic nitrogen (as a fertilizer) has been exported to less-developed nations to enhance their ability to grow food crops. The great success of sharing this technique and other agriculture technology since 1960 is referred to as the "green revolution" and has helped avoid some famines in Africa and elsewhere.¹⁵

The implications of crude came in the form of the processed Twinkie as well as the seemingly organic, locally grown head of romaine lettuce. In the late twentieth century, humans (and particularly Americans) came to rely more than ever on foods acquired and prepared through the assistance of petroleum. Our histories have told many of these stories of consumption without specifically delineating the role that petroleum played in powering the autos that carried Americans to lunch or the rigs that hauled corn and other raw materials to manufacturers such as Frito-Lay. Neither have our histories clearly captured the work in chemistry laboratories that applied petroleum to an array of uses that moved innovations from the beaker to fill every shelf in local Walmart stores.¹⁶

Chemicals and Flexible Forms Shape a New Consumer Reality

When Barthes waxed about the capabilities of plastic, his comments were stirred by the first use of a plastic replacement valve in heart surgery in the 1950s. In fact, however, he

¹⁴ Steve Ertlinger, *Twinkie, Deconstructed: My Journey to Discover How the Ingredients Found in Processed Foods Are Grown, Mined (Yes, Mined), and Manipulated into What America Eats* (New York, 2008), xi–xii. For a general discussion of these ideas, see Michael Pollan, *Omnivore's Dilemma: A Natural History of Four Meals* (New York, 2006); and Maurice B. Green, *Eating Oil: Energy Use in Food Production* (Boulder, 1978).

¹⁵ On the use of chemicals for military purposes, see Edmund Russell, *War and Nature: Fighting Humans and Insects with Chemicals from World War I to Silent Spring* (New York, 2001). On agricultural uses, see James McCann, *Maize and Grace: Africa's Encounter with a New World Crop, 1500–2000* (Cambridge, Mass., 2007); David R. Montgomery, *Dirt: The Erosion of Civilizations* (Berkeley, 2007); Christian Anton Smedshaug, *Feeding the World in the Twenty-First Century: A Historical Analysis of Agriculture and Society* (London, 2010); and Richard P. Tucker, *Insatiable Appetite: The United States and the Ecological Degradation of the Tropical World* (New York, 2007).

¹⁶ See, for instance, Shane Hamilton, *Trucking Country: The Road to America's Wal-Mart Economy* (Princeton, 2008); and William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York, 1991).

captured the germ of the method historians might use to demonstrate the scale of the transformations in American life made possible when petroleum allowed mass consumption to become inconspicuous. We must follow Barthes and move beyond gasoline-powered engines and chemically enhanced agriculture to consider products in which the petroleum content is largely unrecognizable. The symbol of such oil-based consumer products is, of course, plastics, which enabled significant cultural and social shifts in America.

The industry now known as petrochemicals is responsible for too many consumer products to list—among them, the materials that go into heart valves and Twinkie wrappers. A remarkable statistic from *Chemistry in Context*, a standard chemistry textbook, helps reveal the wide array of applications for which the petrochemical industry is responsible: “37 of the almost 45 gallons in a typical barrel of refined crude oil is simply burned for heating and transportation. The remaining 7.6 gal is used for non-fuel purposes, including only 1.25 gal set aside to serve as nonrenewable starting materials (reactants, commercially called feedstocks) to make the myriad of plastics, pharmaceuticals, fabrics, and other carbon-based industrial products so common in our society.”¹⁷ These uses of petroleum have so intrinsically altered the ways that Americans live, that as petroleum supplies dwindle, humans will likely wish they had conserved crude not to burn but to fulfill these remarkably rare capabilities in the chemistry sector.

On its way to becoming each of those useful substances, petroleum first is transformed into feedstocks, which are used to produce plastics, drugs, detergents, and synthetic fibers. For instance, almost all pharmaceuticals contain benzene rings in their chemical structure, which is refined from petroleum. In addition, such chemicals go on to serve many purposes, including refrigeration and cooling. In many of these applications, chemists initially identified alternative methods of producing the necessary compounds; petroleum entered the laboratory only later as a method for making compounds more easily and cheaply. The design historian Jeffrey Meikle describes this synthetic chemistry as, “everything and nothing.”¹⁸ As a chemical filler, petroleum was added because it cost so little, but the flexibility that it brought to chemists proved to be revolutionary.

For oil companies, the use of crude to manufacture resources for living began in the 1930s but became a corporate priority after World War II. In the case of Shell Oil, its Shell Chemical division switched from manufacturing ammonia and solvents to seeking synthetic substitutes for natural materials and then making them. Early industrial chemistry had concentrated on synthesizing molecules from coal-based feedstocks, mainly to produce chemicals such as benzene and its derivatives. With petroleum, chemists could produce such chemicals less expensively and in larger quantities while also generating more reactive hydrocarbons called olefins, including ethylene, propylene, and butylene, which became building-block chemicals of the new petrochemical industry.¹⁹

As Shell and other petroleum companies formed entire chemical divisions to research petrochemicals and apply them to everyday uses, the best known might have been synthetic glycerine. The limited supply of natural glycerine, a by-product of the soap and

¹⁷ American Chemistry Society, *Chemistry in Context: Applying Chemistry to Society* (New York, 2005), 45. See also Jeffrey L. Meikle, *American Plastic: A Cultural History* (New Brunswick, 1995).

¹⁸ Meikle, *American Plastic*, 3. See also Gail Cooper, *Air-Conditioning America: Engineers and the Controlled Environment, 1900–1960* (Baltimore, 1998).

¹⁹ Peter H. Spitz, *Petrochemicals: The Rise of an Industry* (New York, 1988), 63–69.

fatty acid industries, had become useful by the 1920s as a food preservative, a humectant for tobacco (to help retain moisture), and as a component in the manufacture of such diverse products as shaving cream, toothpaste, glue, soft drinks, mayonnaise, cosmetics, and paper. It also served as a mainstay for the paint industry and in the manufacture of cellophane. By the 1940s Americans used over 200 million pounds of natural glycerine each year (more than a pound per person), although very few consumers realized its presence. In the late 1940s Shell Chemical made Houston, Texas, which already served as a hub for oil shipping and refining, its focus for petrochemical development. Its \$8 million synthetic glycerine plant—the world's first—went on-line at Houston Deer Park in September 1948, and by 1950 its production of synthetic glycerine equaled one-fifth of the nation's prewar output of natural glycerine.²⁰

Similar developments occurred as synthetic rubber replaced natural supplies when Shell developed isoprene rubber, which duplicated the isoprene that served as the chemical building block of the natural rubber molecule. The manufacturers of automobile and truck tires began using isoprene rubber and other polymers developed from petroleum. The influence on consumer America was profound. The postwar expansion of Shell Chemical reached a high point in 1956, when chemical sales totaled a record \$213 million, compared to only \$24 million ten years earlier. In terms of volume, yearly sales rose from 231,000 tons to just over 1 million tons over that period.²¹ These are the type of statistics that allow conspiracy theorists to claim that the inculcation of petroleum into everyday American life through chemistry was an elaborate plan by Big Oil. And there may be some truth to such a claim; however, American consumers swept up these new, cheaper products with vigor.

"Plastics," uttered a friend of the father of Dustin Hoffman's character in *The Graduate* when asked what he foresaw as the promising future for a college graduate in the 1960s. Plastic would have thousands of applications, and some were essential to patterns of everyday human life. As one example, consider the impact of Tupperware and Saran Wrap on food preservation. Again, each innovation in this area grew from earlier resin-based materials that did not use petroleum. In large chemical companies such as DuPont, researchers worked constantly to develop any synthetic material that might prove useful. In a world filled previously only with products made of wood, clay, and a few other organic materials, by the 1930s it became a sign of progress to insert obviously man-made objects of modernity into the most mundane areas of people's everyday lives—such as food storage.²²

Meikle writes that these materials, known as thermoplastics, were "driven not so much by market demand as by the pressure of supply, an overabundance of chemical raw materials, waiting to be exploited." After World War II, lab experiments regularly became consumer products, such as vinyl, which quickly remade cultural genres ranging from music to automobile interiors, and nylon, the elastic threads useful in many applications. In 1939 American companies produced 213 million pounds of synthetic resins. By 1945

²⁰ Kendall Beaton, *Enterprise in Oil: A History of Shell in the United States* (New York, 1957), 542–43, 676–77; "Shell Chemical Corporation," *Shell News* (April 1957), 19, cited in Tyler Priest, "The History of Shell Chemical," unpublished manuscript (in Tyler Priest's possession).

²¹ "Torrance Takes an Opportunity," *Shell News*, 27 (May 1959), 1–3, cited in Priest, "History Shell of Chemical"; "Shell Chemical Corporation," 21–22.

²² *The Graduate*, dir. Mick Nichols (Embassy, 1967). Meikle, *American Plastic*, 85. See also Alison J. Clarke, *Tupperware: The Promise of Plastic in 1950s America* (Washington, 1999).

this production reached 818 million pounds, and by 1951 2.4 billion pounds of synthetic resins were produced in the United States, partly because of the growing reliance on petroleum in the process. It was staggering growth sufficient to remake a civilization. And in the 1950s, writes Meikle, that is exactly what happened as the industry committed to such petroleum-based thermoplastics as “polyethylene that contributed to a flood of new uses—garbage pails, squeeze bottles, hula hoops—lighter, more flexible, less permanent than objects made from thermosets.” The use of petroleum, in particular, allowed plastics to become “infinitely shape-shifting.”²³ Infinite shapes and possibilities—a basic flexibility of form—would become a commodity in its own right if the products could fill basic human needs at extremely low cost. Throughout American consumer society, petroleum-based products fueled the ubiquity of stuff—regularizing overconsumption and making it the new normal.

Conclusion: The American Tradition of Planned Obsolescence

Why was a finite resource worked into so many products on which American consumers came to depend? There are a variety of responses to this question. At times the response sounds similar to a conspiracy theory about corporations trying to generate profit; the clearer explanation, though, is a perfect intersection of consumer passion for convenient products and the corporate drive for profit wedded through petroleum’s flexibility and affordability. Certainly, these qualities gave energy companies reason to experiment with new uses for oil products; however, it also stimulated chemical companies such as DuPont, among others, to substitute petrochemicals in processes in which petrochemicals did not initially exist. For consumers, the outcome was low-priced, widely available, relatively disposable goods—in short, the Walmart world. The simplest answer to why Americans unabashedly seized dependence on a finite resource, therefore, is that American consumers wanted the stuff.

In short, David Potter’s “people of plenty” prioritized their ease and standard of living over almost every other concern. As one of the first observers to take note of this unique model of consumption, the journalist Vance Packard wrote *The Hidden Persuaders* in 1957—an exposé of corporate America’s sociological manipulation through advertisements. “One big and intimidating obstacle,” Packard writes, “was the fact that most Americans already possessed perfectly usable stoves, cars, TV sets, clothes, etc. Waiting for these products to wear out or become physically obsolete before urging replacements upon the owner was intolerable. More and more, ad men began talking of the desirability of creating ‘psychological obsolescence.’”²⁴ With advertisers whetting the public’s desire for more and for replacements, consumption required products that were able to be made in massive amounts and altered easily, whether to improve them with new technologies or adjustments or to compel further consumption. The ubiquity of these products makes plain the incredible influence of cheap petroleum in our consumptive lives. However, the greatest impact of all may not be tied to any specific product.

Instead, the great bonus of synthetic replication and lowered prices was the ethic that infused American mass consumption. With the new society made possible by the innovations

²³ Meikle, *American Plastic*, 176, 125–26, 176–77, esp. 82, 168.

²⁴ Vance Packard, *The Hidden Persuaders* (1957; New York, 2007), esp. 21. For a discussion of this book, see Giles Slade, *Made to Break: Technology and Obsolescence in America* (Cambridge, Mass., 2007), 159–60.

of cheap petroleum came wanton waste. Americans' ability and need to replace what they already had, a defining characteristic of U.S. society in the late twentieth century, was made to sound like an innovation by calling it "planned obsolescence." In *Made to Break*, Giles Slade writes: "Deliberate obsolescence in all its forms—technological, psychological, or planned—is a uniquely American invention. Not only did we invent disposable products, ranging from diapers to cameras to contact lenses, but we invented the very concept of disposability itself, as a necessary precursor to our rejection of tradition and our promotion of progress and change."²⁵ Not only did Americans create inexpensive, easily replaced products from cheap petroleum but they also made a society that wished—and, in fact, needed—to replace these items again and again and again.

Cheap oil often helped make cheap things. At other times, cheap oil allowed chemists to derive cheap replication of costlier products. Reliance on these products helped define basic patterns of consumption in twentieth-century America. Living with oil re-created American life during the twentieth century to the point where the United States came to exist in an ecology of oil.

²⁵ Slade, *Made to Break*, 3–4.