



THE UNIVERSITY OF
MELBOURNE

**School of Anthropology, Geography and
Environmental Studies**

*The Impact of Motor Vehicles upon the Environment
and Health: A Study on Technological Hegemony and
Grass-Roots Counter-Hegemony*

Hans Baer

SAGES Working Papers in Development

ISSN 1833-2129

Working Paper no. 2 / 2006

The Impact of Motor Vehicles upon the Environment and Health: A Study on Technological Hegemony and Grass-Roots Counter-Hegemony

Hans A. Baer

Lecturer

School of Anthropology, Geography, and Environmental Studies and Centre of Health and Society
The University of Melbourne

ABSTRACT

This article discusses the role of motor vehicles, particularly automobiles, within the larger context of the capitalist production and the culture of consumption. It particularly focuses upon the environmental and health consequences of motor vehicles. Finally, this article examines counter-hegemonic movements, particularly ones that have appeared in developed societies, which have come to challenge the technological hegemony that motor vehicles have assumed within the capitalist world system.

Key Words: motor vehicles, environment, health, political ecology, critical medical anthropology.

The Impact of Motor Vehicles upon the Environment and Health: A Study on Technological Hegemony and Grass-Roots Counter-Hegemony

Hans Baer

Introduction

Motor vehicles, with their internal combustion engines, perhaps more than any other machine embody the social, structural, cultural, and environmental contradictions of the capitalist world system. They have had major impacts upon patterns of consumption, settlement patterns (e.g., urban sprawl), traffic congestion, mass transportation, social relations, public policy, the environment, and health. In essence, they have become a hegemonic force in the 20th century, and beyond. As Paul Gilroy observes,

The twentieth century was the century of the automobile, of automobility and mass motorization. Commerce in motor vehicles still constitutes the overheated core of unchecked and unsustainable consumer capitalism, but the impact of car culture extends far beyond those buoyant commercial processes. . . Novel and damaging patterns created by motorization have profoundly altered the political economy of everyday life (Gilroy 2001:81-83).

This article examines the impact of the automobilization upon the ecological body and the human body, as well as well as challenges to the technological hegemony of motor vehicles. As a critical anthropologist, in part following in the footsteps of critical sociologists Freund and Martin (1993), I seek to contribute in this essay to both the political ecology and the political economy of the health of motor vehicles.

Motor Vehicles, Capitalist Production, and the Culture of Consumption

James J. Flink (1988:viii) contends that the rise of the automobile industry and a massive network of roads are “central to the history of the advanced capitalist countries in the twentieth century, and explain an especially large part of the history of the American people.” Although Europeans invented the internal combustion engine, the United States assumed the lead in automobile production by the early 20th century. Indeed, the production and consumption of automobiles became a major component of Fordism. As Lee observes,

During the 1920s, mass production in the US was drifting rapidly towards both a crisis of production and a crisis of consumption. The new productive regime pioneered by Henry Ford had succeeded in changing dramatically the quantitative and qualitative output of commodities, but it had not significantly altered the established wage/labour relation. . . . But the arrival of mass production, of course, required mass consumption: a sufficiently sized mass market composed of the wage-earning classes that would be able to absorb the influx of mass-produced commodities (Lee 1993:77).

In addition to having offered his workers the unheard of five-dollar-eight-hour day incentive one year after the opening of his first plant in 1914, Ford embarked upon a campaign to socialize his workers into core American values that included abstinence from alcohol but also adoption of stable familial patterns and mass consumerism, which included purchase of one of his automobiles at a relatively affordable price. His initial efforts met with some worker resistance to “what ever essentially the alien ways of life promoted by the new productive regime and the advertising imagery surrounding the consumer goods it produced” (Lee 1993:78). As a result of the stock market crash of 1929 and the Depression of the 1930s, more progressive segments of the U.S. capitalist class found a new ally in Roosevelt’s New Deal which utilized the state as a “means of providing enough employment to generate sufficient consumer demand so as to absorb the very worst excesses of overproduction” (Lee 1993:80).

The role of the state in advanced capitalist societies has been to resolve the contradictions that develop in a market economy and to reduce social conflicts that may threaten the stability of the social system. The state must be responsive both to the

requirements of the economy and the organized demands of the public. Although the state must cater to the latter to some extent, it never questions the logic of the corporate economy and a stratified social system. Studies by Mills (1956), Domhoff (1990), and others have documented the upper-class origins of many high-echelon members of the U.S. state, particularly those in the executive branch of the federal government. Consequently, when the state promotes changes in public policy, including those related to various aspects of motor vehicle production and highway construction, they tend to be in harmony with the interests of the corporate sector. As Taebel and Cornehl's observe,

Corporate administrators and technicians, particularly those of the auto industry, have long moved freely in and out of the federal government, thus blurring the line between governmental interests and those of private business concerns. Nowhere is this mutuality of interests more clearly understood or more staunchly promoted than among the leaders of the auto corporations themselves (Taebel and Cornehl's 1977:75).

Roosevelt's vision of economic stability and democratic welfarism did not come to full fruition until after World War II – an event that did much to overcome the Depression and to propel the United States into the position of the foremost capitalist nation and the leading culture of consumption in the world. A key component of the new corporate-state alliance was the “concentration of industrial activity into a few key sectors, most notably those of automobile production, building and construction, shipping and other transportation equipment, petro-chemicals, steel, rubber” and the production of a wide array of household appliances and goods (Lee 1993:84). The automobile became a link between the suburban home and the workplace, shopping centers, movie theaters, sports stadiums and arenas, and tourist sights and vacation resorts. Furthermore, the automobile served to “bypass the threatened social alienation which was said to result from the geographical dispersal of localized communities and the physical rupture of traditional kinship bonds that followed from the ease of modern spatial mobility” (Lee 1993:130). Automobile advertisements, which in the United States alone come to \$40 billion a year (Kay 1997:17), frequently have promised and continue to promise their target populations that they will achieve power, prestige, freedom,

sexual desirability, and prowess if they choose to become the proud owners of a highly individualized form of transportation.

The reality that North Americans, encouraged on by corporate advertising, have come to love their cars is captured in Flink's book *The Car Culture*. He observes, "[d]uring the 1920s automobility became the backbone of a new consumer-goods-oriented society and economy that has persisted into the present" (Flink 1973:140). By this time, as Barnet and Cavanaugh (1994:262) so aptly note, "the car became a primary locus of recreation, a badge of affluence, a power fantasy on wheels, a gleaming sex symbol," all images that have been heavily promoted by the automobile industry through intensive advertising. In their classic community study of Middletown (Muncie, Indiana) during the 1920s, the Lynds (1929:950) reported that "the make of one's car is rivaling the looks of one's place as an evidence of one's belonging" among members of the "business class". Despite the Depression, they reported that by the mid-1930s, the automobile had become an essential object of ownership for the prototypical Middletown worker for whom "it gives the status which his job increasingly denies, and, more than any other facility to which he has access, it symbolizes living, having a good time, that thing that keeps you working" (Lynd and Lynd 1937:245)." Particularly following World War II, the automobile symbolized the affluence that many young working-class Americans now enjoyed compared to the socio-economic circumstances of either their parents or themselves in earlier times (Moorhouse 1983).

Down under, War Bonds posters urged Australians to save for a post-World War II car (Davison 2004:3) and the Holden station wagon became in the late 1950s a "mobile embodiment of a middling-class suburb family life" (Davison 2004:21). Indeed, the American architect Walter Burley Griffin designed Canberra, the national capital, with its elaborate road system consisting of concentric circles and turnarounds, with the automobile in mind rather than trains or trams. Although Canberra has grown to a sprawling and still rapidly-growing city of some 310,000, with a bus system vastly superior to that of most U.S. cities of roughly the same size, politicians, urban planners, and a substantial number of residents postpone the inevitable day of reckoning in terms of traffic congestion by arguing that a light rail system would be prohibitively expensive.

At any rate, automobiles constitute the second most expensive commodity (after homes) that Americans purchase. In 1990, Americans spent 31.3 percent of their income on motor vehicles (Freund and Martin 1993:16). Indeed, as Simpson (1994:3) so aptly observes, automobiles have “increasingly become extensions of home: radio, stereo, CD players, telephone and a whole range of other home comforts are not matched by local public transport,” all of which ingeniously seduce people away from public transportation. In recent decades, automobile firms have been searching for new markets in the Third World and, with the collapse of the Soviet bloc, in Eastern Europe. During the Cold War era of the 1950s and early 1960s, General Motors (GM) urged patriotic U.S. citizens to “see the USA in your Chevrolet.” Such advertisements on the part of the automobile industry served to seduce North Americans, as well as Australians, away from what was once a relatively well-developed mass transportation system that included passenger trains, numerous intercity bus lines, and extensive urban and interurban trolley or tram lines. Indeed, a consortium, called National City Lines, consisting of General Motors, Standard Oil of New Jersey, and the Firestone Tire and Rubber Company had spent \$9 million by 1950 to obtain control of street railway companies in sixteen states and converted them to less efficient GM buses. The companies were sold to operators who signed contracts specifying that they would buy GM equipment.

National City Lines in the 1940s began buying up and scrapping parts of Pacific Electric, the world’s largest interurban electric rail system, which by 1945 served 110 million passengers in 56 smog-free Southern California cities. Eleven hundred miles of Pacific Electric’s track were torn up, and the system went out of service in 1961, as Southern California commuters came to rely primarily on freeways (Flink 1973:220). Unfortunately, Henry Huntington, the owner of Pacific Electric, used his interurban trolley company more as a scheme for promoting his real estate endeavors than providing a public service and often alienated citizens in various ways, including in his failure to provide lines that connected suburbs to each other as opposed to strictly city centers (Bottles 1992). A similar process in which a consortium of road interests colluded to destroy efficient trolley or trams systems occurred in numerous cities throughout the United States and Australia (Goddard 1994; Davison 2004).

In the 1950s, with the assistance of the Eisenhower administration, the development of an interstate highway system resulted in enormous profits for corporate interests and benefits to supportive politicians, while hindering the development of efficient public transportation, and thereby forcing the general public to purchase and use cars for transportation (Leavitt 1970). Indeed, Lewis Mumford (1963) argued that the federally funded highway programs of the 1950s contributed to the creation of a “one-dimensional transportation system.” According to Crawford,

The Interstates gave truckers a subsidized route network that allowed them to compete successfully with railroads despite the labor and energy inefficiency of trucking. It also gave real estate developers the high-speed arteries leading to downtown that made large-scale suburban sprawl possible (Crawford 2000:88).

A powerful lobby consisting of the automobile industry, the American Automobile Association, petroleum companies, and trucking companies, continues to pose a barrier to the development of an effective public transportation system in the United States. Whereas heavy trucks contribute more than 95 percent of the highway deterioration in this country, trucking companies pay only 29 percent of the highway bill (Freund and Martin 1993:2).

Various U.S. cities, such as Houston, Detroit, and Phoenix, as well as cities in other parts of the world, such as Perth and Canberra in Australia and Bangkok in Thailand, have developed into what Newman and Kenworthy (1999:31-33) term “Automobile Cities.” In describing the economic situation in U.S. society during the 1970s, Sweezy (1973:7) contended that the “private interests which cluster around, and are directly or indirectly dependent upon, the automobile for their prosperity are quantitatively far more numerous and wealthy than those similarly related to any other commodity or complex of commodities in the U.S. economy.”

Although the United States has long assumed the lead in the promotion of motor vehicles as a means of transporting both people and consumer products, “automobilization” has become a global phenomenon. Simpson (1994:1) reports that the number of licensed automobiles in Britain increased from 13,399,000 in 1974 to 19,737,000 in 1991, an increase of 47 percent. Along with industrial pollution, motor vehicles have transformed cities around the world, particularly ones in underdeveloped

nations, into environmental disaster areas accompanied by a wide array of health problems. Over a decade ago, Zuckerman (1991) itemized the following components of the “world car crisis”: (1) 500 million vehicles on the road; (2) mounting traffic congestion; (3) the impact of pollution on personal health and climatic change; (4) a heavy dependence upon fossil fuels; (5) 250,000 traffic deaths per year; and (5) 50 million new vehicles each year. Needless to say, these problems have intensified as humanity has entered the 21st century.

The revolving-door syndrome between the U.S. motor vehicle industry and the state is illustrated by the fact that both Charles Wilson, a former General Motors president, and Robert McNamara, a former Ford president, both served as secretaries of defense and that Thomas Mann, a high-ranking state department official, became president of the Automobile Manufacturers Association. A massive highway lobby consisting of motor vehicle manufacturers and dealers, petroleum companies and distributors, the United Auto Workers, the American Automobile Association, and highway construction companies heavily influence party politicians in the federal, state, and local governments to pass legislation that promotes the culture of automobility. Although various American cities, such as Portland, San Diego, Salt Lake City, St. Louis, and Baltimore, have embarked upon improvements in mass transportation systems, these function by and large as supplements to automobiles.

In Australia, the motor vehicle lobby and the Liberal Party eventually convinced the Labor Party to join them in the promotion of road construction rather than prop up a deteriorating public transportation system (Davison 2004:125). According to Davison (2004:261), “[b]y the 1990s more than 80 percent of daily journeys in Melbourne were made by car, and more than 50 percent of households had two or more cars.” Indeed, every city in Australia, except Melbourne, lost its trams and trolley buses between 1950 and 1970 (Ponting 1992:337). Nazi Germany constitutes another example of the close ties between the automobile industry and the state. Hitler unveiled his strategy to rejuvenate the declining German auto industry at the International Automobile and Motor Cycle Exhibition in Berlin a few days after coming to power in 1933 by announcing plans for the development of the Volkswagen and the autobahn (Wolf 1996:97-98). The Volkswagen plant produced military jeeps and Daimler Benz and BMW produced aircraft engines, tanks, and armored trucks (Wolf 1996:100). Opel,

owned by General Motors, and Ford also manufactured products for the Nazi war apparatus.

Despite the fact the United States leads the world in terms of the total number of motor vehicles and motor vehicle mileage per capita, “automobilization” has become a global phenomenon (Sweezy 1973:7). In 1990 there were reportedly approximately 550 million motor vehicles in the world, a number that continues to rise with population increase and consumer demand spurred on by corporate advertising (Graedel and Allen 1998:115). In Eastern European countries, for example, which used to rely heavily upon trolley cars as a form of public transportation, the wave of consumerism that followed in the wake of the collapse of the Soviet Union resulted in a massive increase in the number of automobiles and traffic congestion. These former Eastern bloc countries have subsequently embarked upon large-scale programs of highway construction and have abandoned railway lines as more and more people turn to cars for transportation. Table 1 below provides statistics on the number of motor vehicles manufactured in various world regions and selected countries in 2003 and 2004.

Table 1 – Motor Vehicles Manufactured in 2003 and 2004 in World Regions and Selected Countries*

Motor Vehicles	2003	2004	% Change
Europe	20,000,286	20,829,774	4
America	18,280,312	18,826,944	3
USA	12,114,971	11,989,387	-1
Brazil	1,827,791	2,210,062	21
Asia-Oceania	21,986,694	24,086,520	10
Australia	413,261	411,406	0
China	4,443,686	5,070,527	14
India	1,161,523	1,511,157	30
Japan	10,286,218	10,511,518	2
Africa	395,933	422,017	7

*Source: Adapted from Data Presented by the International Organization of Motor Vehicle Manufacturers, www.oica.net.

Motor vehicle production and utilization has been also on the rise in underdeveloped or developing societies. Whereas annual travel by private passenger cars (passenger km per capita) in 1990 stood at 19,004 in Houston, 16,686 in Los Angeles, 9,417 in Sydney, 4,482 in Paris, and 3,175 in Tokyo, it stood at 6,299 in Kuala Lumpur, 4,634 in Bangkok, 2,464 in Seoul, and 1,546 in Jakarta (Newman and Kenworthy 1999:84). And, as less-developed countries gain more purchasing power in the global economy, the number of cars in these countries is bound to grow. Spellerberg reports,

In China. . . there are 15.8 million motor vehicles and the increase in numbers is outpacing the capacity of roads to support the traffic. Once a rare luxury, a romantic experience, cars and traffic density have now become a major environmental issue (Spellerberg 2002:7).

Anthropologist Daniel Miller (1995) has written a fascinating account of the centrality of automobiles in one Third World community, namely the town of Chaguanas in Central Trinidad, the fastest growing urban center within Trinidad and Tobago. Although most residents of Chaguanas achieved affordability of a car, even if only a re-upholstered older one, on in the wake of the oil-boom of the late 1970s, it has come to dominate the Trinidadian self-image:

People are constantly recognized through their cars. . . Street dialogue constantly asserts that men are attractive to women as much through the body of their cars as their own bodies and there are abundant metaphors based on car parts (Miller 1995:286-287).

Furthermore many residents cease walking once they have acquired a car which has developed into a significant marker of modernity. I am personally reminded of how when I was an instructor at Kearney State College, now the University of Nebraska at Kearney, in the early 1970s, some of the Nigerian students in my classes regarded acquisition of a used car for which they paid with money earned through their low-paying jobs as a sign that they had achieved a slice of the American Dream, despite fact that they lived within easy walking distance of the campus.

The Impact of Motor Vehicles on the Environment

Along with industrial pollution, motor vehicles have transformed many cities around the world, particularly ones in the Third World such as Mexico City, into environmental disaster areas (Robinson 1971). Of the estimated 4.4 million tons of human-generated pollutant emitted into the air of Mexico City in 1989, 76 percent were produced by motor vehicles (Freund and Martin 1993:67). In 1985, of the 3.5 million tons of human-generated pollutants emitted into the air of Los Angeles – the most polluted city in the U.S. – 63 percent were created by motor vehicles (Freund and Martin 1993:67). Such developments in air quality promoted the Union of Concerned Scientists in 1991 to shift its primary concern from nuclear energy to the internal combustion engine and the Natural Resources Defense Council to declare the following year that the automobile was “the worst environmental threat in many U.S. cities” (quoted in Kay 1997:80).

Cities vary greatly in terms of carbon dioxide (CO₂) emission and other motor vehicle pollutants. Whereas the transportation-produced CO₂ in the New York metropolitan area totaled 3,378 kilograms per capita in 1990, it was 5,193 kilograms in the Houston area (Newman and Kenworthy 1999:120). In contrast, Toronto has 46 percent less CO₂ per capita than the average U.S. city, largely due to an extensive public transportation system. Motor vehicles have contributed to the destruction of ozone in the stratosphere as a result of a catalytic process in which chlorofluorocarbons and other chlorine-containing gases produce chlorine. Another major by-product of gasoline exhaust is benzo(a)pyrene, a carcinogenic chemical that is suspended in urban air. Motor vehicles also emit carbon monoxide, sulfur oxides, and nitrous oxides, which in turn contribute to acid rain and human respiratory complications. Despite improvements in car fuel economy and emissions controls standards, a doubling of miles driven during the 1980s and the 1990s by and large negated the impact of these technological innovations. Furthermore, while the catalytic converter “effectively breaks down the nitrous oxides that contribute to smog and local air pollution. . . , it creates nitrous oxide, benign in smog creation but 300 times more potent than carbon dioxide as a greenhouse gas” (Porter 1999:81).

The Clinton administration's creation of a Partnership for a New Generation of Vehicles provided funding to national laboratories and auto-parts companies with the objective of creating a mid-sized automobile that would get 80 miles to the gallon, but the growing popularity of gas-guzzling expensive sports utility vehicles (SUVs) - which the US government classifies as "light trucks," and so are subject to less stringent emissions standards – significantly added to air pollution during this period (Bradsher 2002:70). Ironically, SUVs have particularly appealed to baby boomers, many of whom view themselves as outdoorsy and sensitive to environmental issues, as well as movie stars and directors, singers, and other entertainment idols. Nevertheless, SUVs reportedly produce up to 5.5 times as much exhaust fumes per mile as do standard automobiles (Bradsher 2002:xvii).

While the overall automobile pollution problem is greatest in the U.S. and other industrialized countries, the situation in less-developed countries is problematic at the individual vehicle level. In resource-poor settings, limited funds exist to maintain emission control equipment on vehicles and to enforce any regulations that may exist (which are often non-existent). One just has to walk through the streets of Quito, Ecuador or Lagos, Nigeria to experience this first hand.

The Impact of Motor Vehicles on Health

When automobiles first began to appear, various public health reformers viewed them as a panacea to the manure and urine deposited by horses in cities. In contrast, motor vehicles have evolved into a major source of accidents around the world and an enemy to the environment. Miller (2001:7) reports that in 1990, 420,000 people were killed and some 9 million were injured around the world as a result of motor vehicle accidents, and that between 1960 and 1994 approximately five million died as result of motor vehicle accidents. Road traffic accidents are reportedly the leading cause of death worldwide among males between ages 15 and 44 (Crawford 2000:70). In contrast, between 1894 and 1994, 9,678 people died in railroad disasters.

Motor vehicle accidents are the leading cause of death in the 15-to-24 year old age category in the United States (Wright 1992:101). Crawford observes,

The USA is one of the safest countries in the world in terms of deaths per distance driven, but in 1998, despite safer cars and highways, US motor vehicle crashes caused almost one death per 100 million vehicle-kilometers traveled, for a total of 41,471 lives lost (Crawford 2000:70).

In their survey of cities in various parts of the world, Newman and Kenworthy (1999:118) report that traffic deaths in 1990 in U.S. cities, “despite their highly developed road systems, strict regulated traffic, and a population generally well educated in traffic safety issues,” were the highest at 14.6 per 100,000, compared to 12.0 per 100,000 in Australian cities, 6.5 in Toronto, 8.8 in European cities, 6.6 in “wealthy” Asian cities, and 13.7 in “developing” Asian cities. Toronto’s relatively low rate is due to the fact that this city has a good public transportation system. Furthermore, “Amsterdam, at 5.7, and Copenhagen, at 7.5 deaths per 100,000, have among the lowest rates in Europe and have among the highest rates of bicycle usage” (Newman and Kenworthy 1999:119).

Speed constitutes a major contributing factor to motor vehicle deaths and accidents. The implementation of a short-lived 55 miles per hour speed limit in the United States reduced highway fatalities 20 percent (Wolf 1996:172). Germany is famous or infamous, depending upon one’s perspective, for the lack of a speed limit on its autobahns, a policy that was first established during the Nazi era. Whereas the German Democratic Republic (former East Germany) had a speed limit on its autobahns, the unification of 1990 resulted in the eradication of this restriction and a doubling of the number of highway fatalities (Wolf 1996:172).

Motor vehicle exhausts emit an array of toxic and carcinogenic pollutants, such as benzene and formaldehyde. The American Lung Association estimated that in 1985 motor vehicle pollution contributed to some 120,000 deaths in the United States (Freund and Martin 1993:29). Sixty percent of the residents of Calcutta, India, were found to have pollution-related respiratory diseases (Freund and Martin 1993:67). Additionally, some brake linings contain asbestos, a well-known carcinogen.

Motor vehicle emissions contribute to elevation of ozone levels, of which greater Atlanta is a prime example. The city has evolved into the leading US metropolitan area in vehicle miles traveled per person per day at 34.1, as opposed to other leaders, such as Dallas (30.1), Washington, DC (22.6), and Los Angeles (21.5). The result is massive air

pollution, including ozone. Research Atlanta, an institute affiliated with Georgia State University, has reported that asthma-related visits to the pediatric emergency clinic at Grady Memorial Hospital increase by a third during high ozone days (Doyle 2000:3).

The Centers for Disease Control and Prevention has estimated that the number of asthmatics in the United States increased from 6.8 million in 1980 to 17.3 in 1998, in part due to ozone pollution (Doyle 1998:4). An estimated 100 million Americans live in places that do not meet the EPA's eight-hour air quality standard for ozone (Doyle 1998:5). The situation does not fare any better internationally. In the Athens metropolitan area, for instance, the death rate increases as much as fivefold on the most polluted days (Nadis and MacKenzie 1993:23), and Mexico City reportedly exceeds EPA ozone standards virtually every day of the year.

Pollution is not the only health problem associated with cars. Motor vehicle driving, particularly under congested conditions, induces stress and heightened blood pressure, contributes to medical complications such as lumbar disk herniation, or "motorist's spine," and contributes to sedentarization. Truck drivers in particular suffer a high rate of back injuries. In addition to alleging that automobile manufacturers had resisted legislation and public pressure to build safer cars, O'Connell and Myers (1965) assert that they attempted to shift responsibility for the increasing number of accidents to driving behavior and road conditions. Motor vehicles also pose hazards for pedestrians and cyclists. The National Safety Council reported some 6,600 pedestrian deaths and 800 cyclist deaths in 1989 in the United States (Freund and Martin 1993:102).

SUVs constitute the latest health hazard to hit the roads of the United States but are also becoming popular in other parts of the world. Although they are often perceived as safe due to their large size, particularly the early models of SUVs, such as the Bronco II, they were prone to roller-overs that killed and injured occupants at an alarming rate. Bradshar (2002:163) reports that SUVs rollovers killed some 12,000 people in the United States alone during the 1990s. Despite design improvements that have made SUVs safer for occupants, their large size continues to pose a hazard to other car drivers and pedestrians. Whereas standard automobiles with their low bumpers often flip pedestrians onto a relatively soft hood, SUVs hit them higher up, thereby inflicting worse injuries.

Automobilization also impacts psychological health. Auto transportation discourages patterns of social interaction vital to mental well-being in that most motorists, especially in advanced capitalist societies, drive alone. As Wolf (1996:192) so aptly observes, "[t]he car society reproduces an elementary phenomenon of the capitalist mode of production: the de-personalization and reification of human relationships." With the decline of public transportation, especially in the United States, mothers in particular function as chauffeurs for their children as they transport them hither and yond in sprawling suburbs and developments. In fact, in less than ten years after 1983, women's automobile travel reportedly quadrupled in the United States (Kay 1997:22). Ironically, at the same time, low-income people living in inner cities often find themselves with inadequate transportation to jobs, medical clinics and hospitals, all of which are increasingly located in suburban areas. As Kay so aptly observes,

The car culture has thus become an engine of inequity, raising high the barriers of race and class. Transportation that is difficult at best, nonexistent at worst, darkens their lives in a myriad of ways and adds to the financial and social inequality they suffer (Kay 1997:38).

Elderly people with marginal vision and reflexes often continue to drive because the automobile is necessary to maintaining social connections with friends and family scattered about urban areas with poor public transportation. Finally, various studies have indicated that automobile driving, particularly in conditions where traffic congestion is moderate to light, may contribute to "road rage" because drivers feel frustrated by the inability to reach their destinations in the shortest time possible (Smith 2002:34-41).

Challenges to the Technological Hegemony of Motor Vehicles

Despite the existence of massive corporate support for the on-going use of motor vehicles, in the form of advertisements and other promotional campaigns, there have been some counter-hegemonic efforts, particularly within the Green movement in Western Europe, to resist the automobilization of society by emphasizing the need for people to rely on other forms of transportation. Environmental groups, car safety

activists, bicyclists, and other social activists in the United States and other parts of the world have extracted some concessions from the corporate class and its political allies on issues such as emissions control standards, motor vehicle design, highway construction, and public expenditures for mass transit systems.

Public awareness of some negative aspects of motor vehicle transportation reached new heights with the publication of Ralph Nader's (1965) book *Unsafe at Any Speed*. Environmentalists and other social activists began to challenge the pollution, health hazards, traffic, sprawl, and fragmentation of social life resulting from motor vehicles and highways during the 1970s (Golten et al. 1977). Such efforts contributed significantly to the passage of both federal and state regulatory laws in the United States. Such legislation offered a technological fix that mandated catalytic converters and periodic car inspections. Rajan (1996), however, asserts that mandatory pollution-control devices and emissions testing do not significantly reduce pollution.

The Energy Policy and Conservation Act of 1975 forced the U.S. automobile industry to improve fuel economy in passenger cars, making them more like those manufactured in Europe and Japan. Unfortunately, despite various reforms, the sanctity of the automobile as an integral component of U.S. political economy and culture has generally gone unchallenged. Nevertheless, an increasing number of scholars over the past decade or so have made suggestions for reducing reliance upon automobiles. Wright (1992), for example, proposes the following steps: (1) switching from private motor vehicles to trains and buses; (2) increasing the distance that transport vehicles can travel per energy unit; (3) manufacturing engines that are less polluting; (4) implementing road designs, traffic regulations, and vehicle operations that contribute to more efficient vehicle utilization; and (5) relying upon less polluting sources of fuel.

Furthermore, pockets of resistance to the motor vehicle hegemony is manifested in the slow but steady development of a "global auto city protest movement" (Newman and Kenworthy 1999:60-62). Indeed, Kay (1997:286) asserts "that deposing the car from its dominion over the earth is a radical, even revolutionary, move", and argues that those who participate in this still burgeoning "countercultural rescue movement" must act as "promobility advocates: pro-walking, pro-cycling, pro-transit" (Kay 1997:286). Kay (1997:356-357) advocates a strategy of anti-automobile activism at the local, regional,

state, and national levels that challenges “moribund highway-based plans” and the “vehicle-first policies promoted by long-entrenched forces.”

Grass-roots groups opposed to highway construction projects that threaten stable and historic neighborhoods and rural landscapes have formed in states such as Oregon, Kansas, California, Indiana, West Virginia, and New Hampshire. Grass-roots groups in both Toronto and Vancouver prevented freeways from being built in the inner city (Newman and Kenworthy 1999:217), and over 900 anti-freeway groups have emerged throughout Britain (Newman and Kenworthy 1999:60). The Link-Up Conference and other similar events have served as forums for more than 100 anti-freeway groups in Australia.

Critical Mass, an organization of pro-cycling activists, has engaged in pro-bicycle and anti-automobile mass actions in cities such as San Francisco, Austin, Washington, DC, and Edmonton. The Green movement in Western Europe has mobilized opposition to the automobilization of society by emphasizing the need for people to rely on cycling and other forms of transportation. Unfortunately, notwithstanding this progress, U.S. Greens have not systematically challenged the environmental damage created by the leading car culture in the world.

Like Critical Mass in North America, environmentalists in Germany attempt to promote cycling as a form of transportation by sponsoring demonstrations consisting of bikers riding through otherwise busy city streets. Ironically, while cycling constitutes an “environmentally” mode of transportation, as well as a healthy means to provide the body with aerobic exercise, it will high remain a highly dangerous activity as long as the streets and highways are filled with fast-moving motor vehicles. However, grass-roots groups in Copenhagen, Amsterdam, and other Dutch cities have done much to create bikeways, marked paths for cyclists on roads, and a “culture of respect” for cyclists (Newman and Kenworthy 1999:206). Simon Batterbury (2002:2-3) reports that Copenhagen and the community of Frederiksberg situated within the city limits has 307 kilometers of bike paths and that in 2000 “34% of home to place-of-work trips were made by bicycle.” In the U.S. some 20 pedestrian advocate groups have formed a coalition called America Walks (Kay 1997:336) and citizens consisting of walkers and bicyclists have pressured cities to create greenways and bike paths in communities around the country (Kay 1997:336-339).

Illustrating the dialectic of automobile use, Simon Maxwell (2001), an anthropologist, conducted focus-group discussions in order to ascertain how residents of Cambridge, England, juxtapose their utilization of automobiles with their concerns about their impact on social life and the environment. Although he found that many participants held other car users and the government as being responsible for the negative consequences of reliance upon automobiles, he also found that,

[M]any people had also made great efforts to limit or reduce their car use. For these participants, the social and environmental benefits of finding alternatives to the car intersect with other varied concerns, ranging from personal health to general quality of life (Maxwell 2001:209).

Newman and Kenworthy (1999:144-189) propose five policies for overcoming automobile dependency: (1) traffic calming in which speed plateaus, neck-downs, and other strategies are employed to slow down traffic in order to make streets safer, particularly for pedestrians, cyclists, shoppers, and residents; (2) the construction of quality transit systems as well as bike and walking paths; (3) the development of “urban villages” or multi-nodal centers with mixed, dense land use; (4) growth management to counter urban sprawl; and (5) and increasing taxes on motor vehicle transportation in various ways. Elsewhere, J.H. Crawford (2000) offers a radical solution to the multi-faceted problems associated with motor vehicles in cities. While recognizing that transportation is a key component of modern cities, he maintains that the automobile is the “most space-intensive form of urban transport ever devised and has forced cities to expand into rural areas” (Crawford 2000:24). He additionally contends that it “has isolated the young, the elderly, and anyone who does not drive, particularly in suburban areas lacking any other form of transport” (Crawford 2000:73). Dismissing traffic management as an unsuitable solution, Crawford (2000:31) maintains that rail transport offers a cheaper, cleaner, faster, and more comfortable alternative to cars. The denser settlement pattern of car-free cities would help restore a sense of community missing in suburban areas and allow for nearby parks and other green spaces. He does admit, however, that cars can improve mobility in rural areas and small towns (Crawford 2000:75-76).

The significance of relying on trains rather than cars for transportation is by no means a utopian idea. According to Newman and Kenworthy (1999:155), “hundreds of cities, both large and small, in Europe, North America, Australia, and other nations, have joined the light rail revolution in recent years.” In the United States, light rail systems have been developed in Baltimore, St. Louis, Dallas, Portland, Salt Lake City, and San Diego. In contrast to Crawford (2000), Newman and Kenworthy believe that buses are an important component and have three roles to play in the development of efficient public transportation systems: “(1) as an inferior solution before a rail spine is built, to fulfill the same line-haul function; (2) as a local distributor for flexible linkage systems to the line-haul route; and (3) as an effective local service in areas of lower demand where there is little possibility or need for rail service.” While such efforts are commendable and should continue to be supported, in most instances the on-going emphasis on automobile utilization continues to quickly counteract the former. Despite the creation of the Metropolitan Atlanta Rapid Transportation Authority (MARTA), for example, the Atlanta area has continued to evolve into a motor vehicle nightmare where the average commute has reached 35 miles per day, about 50 percent greater than that in the Los Angeles area, and which had 69 smog alert days in 1999 (Kunstler 2003:51). Conversely, MARTA has become a “second-class transportation system for second-class citizens” (Kunstler 2003:68), while commuter highways continue to be widened.

In contrast to Atlanta, various cities, including Singapore, Hong Kong, Zurich, Copenhagen, Freiburg (Germany), Vancouver, Toronto, and Boston have created innovative strategies for reducing motor vehicle utilization and encouraging residents to rely on various forms of public transportation. Copenhagen has adopted various traffic calming strategies, including the creation of extensive pedestrian zones in the city center and extensive thirty-kilometer-per-hour zones; alternate forms of transportation, including bike paths; extensive reduction of parking areas; extremely high motor vehicle registration and parking fees; and urban villages around train lines and mixed land use in centers (Newman and Kenworthy 1999:204-208). Copenhagen is one of the world’s most bike-friendly cities:

One-third of the city goes to work by bike. Like many European cities,

Copenhagen had a lot of bicycle use early this century, but unlike other cities, it has not abandoned bicycling as it has modernized and become wealthy (Newman and Kenworthy 1999:206).

Copenhagen has designated bike right-of-ways on road and has fostered an ethos of respect for cyclists.

Conclusions

The centrality of motor vehicles as a mode of transportation is an integral part of the capitalist world system. Fueled by profit-seeking, political complicity and promotion of a consumptive culture, car ownership has grown worldwide and has become a symbol of both freedom and status. While the culture of automobility is most advanced in the developed countries, it also is quickly spreading to developing countries as globalization presses onward. These countries, however, generally lack the necessary resources to pay for the infrastructure that accompanies motor vehicles as well as strict environmental protection laws. Nor are health-care systems as well developed as in developed countries.

Unfortunately the convenience that the automobile may confer on people at various times is counter-acted by congestion, social isolation, high costs, and loss of time. Based upon a detailed historical study of automobility in Melbourne, Graeme Davison poses the following dilemma:

Mass motorisation was a kind of Faustian bargain. It promised its followers much, but the promises were often negated by the unanticipated consequences of their fulfillment. By attempting to universalize individual mobility the car created congestion. By building freeways to bring communities closer together it often endangered the cohesion of the communities itself. By feeding the desire for speed it caused death and injury. Now, it seems, like Dr. Faustus, we are so deeply in thrall that we cannot escape the bonds of the car, even if we wished to. Are we too far down the on-ramp to turn back? (Davison 2004:xii).

Yet, for the sake of the planet, ultimately for the sake of the both the ecological body and the human body, it is imperative that we turn back, despite the fact that this will be no easy task. In the long run, the contradictions associated with automobility, including those associated with the environment and health, can only be adequately addressed through the creation of global democratic eco-socialism, a system premised upon meeting human social needs and creating a sustainable environment (Baer, Singer, and Susser 1997:232-235). Such a dramatic change obviously requires time and the exertion of our agency, both at an individual level and a collective level. In the short run, the challenges to motor vehicle hegemony by academics, grass-roots groups, and progressive politicians constitute examples of what Andre Gorz (1973) terms “non-reformist reforms” which challenge existing power relations and pave the way for more revolutionary social changes.

REFERENCES

Baer, Hans A., Merrill Singer and Ida Susser. 1997. *Medical Anthropology and the World System: A Critical Perspective*. Westport, CT: Bergin & Garvey.

Barnet, Richard and John Cavanaugh. 1994. *Global Dreams: Imperial Corporations and The New World Order*. New York: Simon & Schuster.

Batterbury, Simon. 2002. *Cycling in Copenhagen*. Draft article at www.simonbatterbury.net.

Bottles, Scott L. 1992. Mass politics and the adoption of the automobile in Los Angeles. *In The Car and the City: The Automobile, the Built Environment, and Daily Urban Life*. Martin Wachs and Margaret Crawford, eds. pg. 1994-203. Ann Arbor: University of Michigan Press.

Bradher, K. 2002. *High and Mighty: The World's Most Dangerous Vehicles and How They Got That Way*. New York: Public Affairs Books.

Crawford, J.H. 2000. *Carfree Cities*. Utrecht: International Books.

Davison, Graeme. 2004. *Car Wars: How the Car Won Our Hearts and Conquered Our Cities*. Sydney: Allen & Unwin.

Domhoff, G. William. 1990. *The Power Elite and the State: How Policy is Made in America*. New York: A de Cruyter.

Doyle, Jack. 2000. *Taken for a Ride: Detroit's Big Three and the Politics of Pollution*. New York: Four Walls Eight Windows.

Flink, James J. 1973. *The Car Culture*. Cambridge, MA: MIT Press.

Flink, James J. 1988. *The Automobile Age*. Cambridge, MA: MIT Press.

Freund, Peter E.S. and George Martin. 1993. *The Ecology of the Automobile*. Montreal: Black Rose.

Gilroy, Paul. 2001. Driving while black. *In Car Culture*. Daniel Miller, ed. 2001. pg. 81-104. Oxford: Berg.

Goddard, Stephen B. 1994. *Getting There: The Epic Struggle Between Road and Rail in The American Century*. Chicago: University of Chicago Press.

Golten, Robert J., Oliver A. Houck and Richard Munson, eds. 1977. *The End of the Road: A Citizen's Guide to Transportation Problemsolving*. Washington, DC: National Wildlife Federation.

Gorz, Andre. 1973. *Socialism and Revolution*. Garden City, NY: Anchor.

Graedel, Thomas E. and Braden R. Allen. 1998. *Industrial Ecology and the Automobile*. Upper Saddle River, NJ: Prentice Hall.

Kay, Jane Holtz. 1997. *Asphalt Nation: How the Automobile Took Over America and How We Can Take It Back*. New York: Crown Publishers.

Kunstler, James Howard. 2003. *The City in Mind: Notes on the Urban Condition*. New York: Free Press.

Leavitt, Helen. 1970. *Superhighway – Superhoax*. New York: Doubleday.

Lee, Martyn. 1993. *Consumer Culture Reborn: The Cultural Politics of Consumption*. London: Routledge.

Lynd, Robert S., and Lynd, Helen Merrell. 1929. *Middletown: A Study in American Culture*. London: Constable and Company.

Lynd, Robert S., and Lynd, Helen Merrell. 1937. *Middletown in Transition: A Study in Cultural Conflict*. New York: Harcourt, Brace, and Company.

Maxwell, Simon. 2001. Negotiations of car use in everyday life. *In Car Cultures*, Daniel Miller, ed. pg. 203-222. Oxford: Berg

Miller, Daniel. 1995. Consumption studies as the transformation of anthropology. *In Acknowledging Consumption: A Review of New Studies*, Daniel Miller, ed. pg. 264-295. London: Routledge.

Miller, Daniel, ed. 2001. *Car cultures*. Oxford: Berg.

Mills, C. Wright. 1956. *The Power Elite*. New York: Oxford University Press.

Moorhouse, H.F. 1983. American automobiles and workers' dreams. *Sociological Review* 31:403-426.

Mumford, Lewis. 1963. *The Highway and the City*. New York: Harcourt, Brace & World.

Nader, Ralph. 1965. *Unsafe at Any Speed: The Designed-In Dangers of the American Automobile*. New York: Grossman.

Nadis, Steve and James J. MacKenzie. 1993. *Car Trouble*. Boston: Beacon Press.

Newman, Peter and Jeffrey Kenworthy. 1999. *Sustainability and Cities: Overcoming Automobile Dependence*. Washington, DC: Island Press.

O'Connell, Jeffrey and Arthur Myers. 1965. *Safety Last: An Indictment of the Auto Industry*. New York: Random House.

Ponting, Clive. 1992. *A Green History of the World: The Environment and the Collapse of Great Civilizations*. New York: St. Martin's Press.

Porter, Richard C. 1999. *Economics at the Wheel: The Costs of Cars and Drivers*. San Diego: Academic Press.

Rajan, Sudhir. 1996. *The Enigma of Automobility: Democratic Politics and Pollution Control*. Pittsburgh: University of Pittsburgh.

Robinson, John. 1971. *Highways and Our Environment*. New York: McGraw-Hill.

Simpson, Barry J. 1994. *Urban Public Transport Today*. London: E & FN Spon.

Smith, E.O. 2002. *When Culture and Biology Collide: Why We Are Stressed, Depressed, and Self-Obsessed*. New Brunswick, NJ: Rutgers University Press.

Spellerberg, Ian F. 2002. *Ecological Effects of Roads*. Enfield, NH: Science Publishers.

Sweezy, Paul. 1973. Cars and cities. *Monthly Review*. 24(11):1-18.

Taebel, Delbert A. and Cornehl, James V. 1977. *The Political Economy of Urban Transportation*. Port Washington, NY: Kennikat Press.

Wolf, Winfried (translated by Gus Fagan). 1996. *Car Mania: A Critical History of Transport*. London: Pluto Press.

Wright, Charles L. 1992. *Fast Wheels – Slow Traffic: Urban Transport Choices*. Philadelphia: Temple University Press.

Zuckerman, W. 1991. *End of the Road: From World Car Crisis to Sustainable Transportation*. Vermont: Chelsea Green Publishing.