

WHEN NEW THINGS WERE OLD:
THREE CASE STUDIES ON THE TRANSITION
FROM MUSCLE TO MOTOR POWER

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How does a novel artifact become a mainstream device? Three case studies on the transition from muscle to motor power indicate that the transfer of practices from old to new technologies facilitates technological change and diffusion. Case One examines the horseless carriage industry in the United States during the first decade of the twentieth century. To understand manufacturers' efforts to generate consumer demand, this study reflects upon printed advertisements, manuals, and social commentaries prior to mass production of the automobile.

Case Two examines motorization in a highly resistant environment—the post-WWI US Cavalry. Cavalry service and drill regulations manuals serve as the basis for understanding the centrality of the horse to the cavalry's fighting strategy and the cavalryman's identity as a combatant. The Cavalry Journal, an internal military publication, provides evidence of the role military horse culture played in impeding—and eventually facilitating—motorization. Mechanisms employed to maintain equine traditions gave birth to the jeep. The use of the jeep under battlefield conditions replicated cavalry-style maneuvers and fighting principles. Similar to the cavalryman and his warhorse, the American GI and his jeep became inseparable.

Case Three addresses the domestication of the jeep in the Philippines, where successful motorization was again attributable to horse culture. Photographs, paintings, and observations from travelers, including the Philippine Commission Report of 1900–1901, and contemporary accounts and reflections of local scholars

supplemented with phone interviews conducted in the Ilocano and Tagalog (Filipino) dialects prove useful sources for understanding the influence of horse legacy on motorization.

Results show that in each case the shift from muscle to motor power required a forced likeness between the motorcar and the horse. Automotive ubiquity did not occur simply because cars became much cleaner, more efficient, and more affordable than horses. In each case, the motorcar relied upon society's long-standing working relationship with the horse in order to be understood and accepted. When cars began to be perceived as functioning like horses, rapid diffusion ensued as socioeconomic and cultural practices built around the horse were transferred to the motorcar.

BIOGRAPHICAL SKETCH

Imes Chiu completed her bachelor's degree at Ateneo de Manila University, Philippines, and International Christian University, Tokyo, Japan. She completed her Master's Degree in Asian Studies in 1990 at Cornell University with a thesis on eleventh-century Burma. She proceeded to teach Tagalog at Cornell and to manage the Southeast Asian Studies Summer Institute Program (SEASSI). When the SEASSI program moved to the University of Washington, she headed the Tagalog summer program there and published a Tagalog self-instructional tape and manual for business travelers. She then managed projects in various industries dealing with enterprise-wide organizational change and start-up concepts.

To my father, Chiu Cheng Beng (Francisco Chiu)

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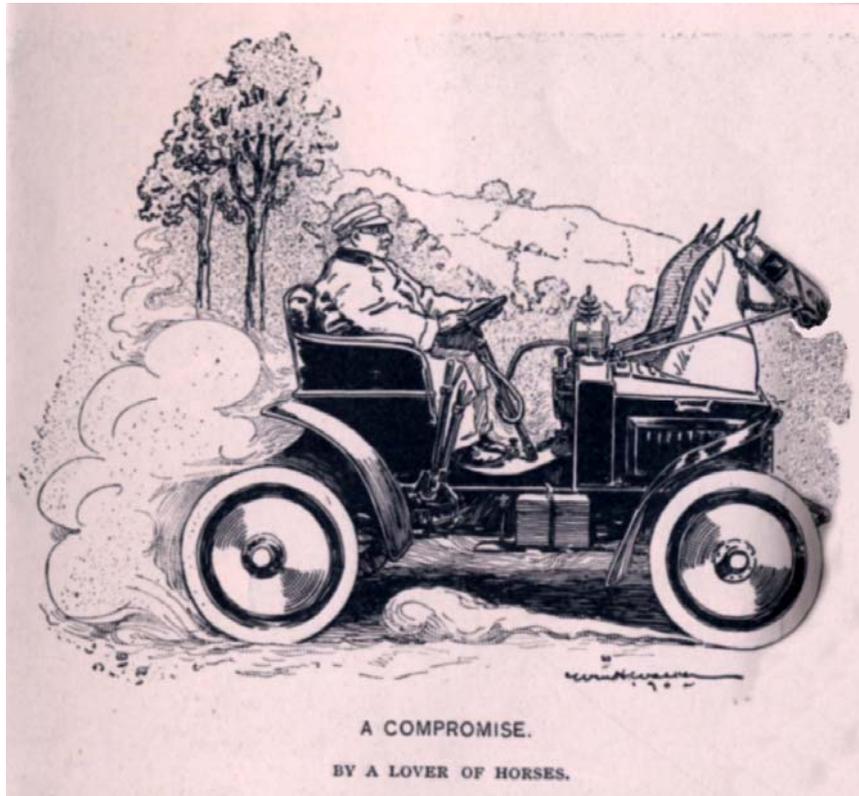
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Source: Life, January 19, 1905, 68.



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Source: Michael Chua, Michael Agricultural Supply, July 2005.
Note: Horse chrome encircled.

Introduction

Why would a 2005 form of public mass transport in the Philippines carry equine symbolism similar to that depicted in a 1905 American cartoon illustration? What links the symbolic expression of a horse from a hundred years ago with a Philippine vehicle of the present? One does not really think of the horse when driving an automobile. In fact, this association seems remote from modern-day sensibilities.

This study revisits a time when this association was immediate and palpable. This dissertation examines the introduction of the motorcar in three different settings during three different periods. It shows how a novel technological artifact—the motorcar—depended upon the material and conceptual resources of the technology it sought to replace—the horse.

At the turn of the century, the idea of a machine with a horselike quality—the ability to be self-propelling—seemed preposterous to the average person. What might seem ludicrous to us in the modern period is the idea of the automobile, a sophisticated technology, relying upon the antiquated horse for its survival. Yet, there was a time, in many places, when such was the case. We having largely forgotten our past, and our early-twentieth-century predecessors looking to an unknown future, may share a similar sense of puzzlement—how could the motorcar be related to the horse?

The horse has become a rarity in most aspects of our modern life. We tend to associate the horse with important but nevertheless nonessential events, such as special occasions and ceremonies. On the fringes of society, we find the horse in sports for the wealthy—polo matches, fox hunting, show jumping, and other equine

events. In these outer reaches we also find other equine activities, such as betting on horse races, participated in by the less affluent.

In everyday life, however, we do not think of the horse. The horse does not come to mind when we drive a car. The idea of using a horse to carry out our daily work routines and errands seems absurd. Today most people do not even know how to ride a horse. The horse in the midst of large superhighways, with their careening automobiles and trucks, is an anomaly. Yet it was just a hundred years ago that the opposite was true.

At the turn of the twentieth century, the introduction of the motorcar¹ to public roads frequented by horse-drawn carriages caused great public alarm, not only in rural² but also in urban areas. This new contraption—a vehicle with no horse—was considered deviant and dangerous.³ One horseless carriage owner was arrested for driving his vehicle to the entrance of Central Park.⁴ George Basalla argues that people often do not know what to do with new technology.⁵ Just as we have trouble today envisioning a world without automobiles, people a hundred years ago probably could not envision a world without horses. As late as World War II, a colonel declared most emphatically that the military horse was irreplaceable: “A machine has no life; horses have—that is the radical difference.”⁶

A technological artifact that is indispensable today, such as the automobile in the US, was not considered as such when it was first introduced. Charles E. Duryea,

¹ According to the Merriam Webster Collegiate Dictionary, 11th Edition, the word “motorcar,” meaning “automobile,” dates from about 1890.

² For discussions on the anti-car crusade, see Ronald Kline, Consumers in the Country: Technology and Social Change in Rural America (Baltimore: John Hopkins University Press, 2000), esp. chapter 2. Also, Ronald Kline and Trevor Pinch, “Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States,” Technology and Culture 37 (1996), 768–773.

³ Charles E. Duryea, “As It Was in the Beginning,” The Automobile, January 7, 1909, 47.

⁴ R. H. Thurston, “The Automobile or Horseless Carriage,” Collier’s, April 28, 1900, 9.

⁵ George Basalla, The Evolution of Technology (Cambridge: Cambridge University Press, 1988), 139.

⁶ Colonel H. S. Stewart, “Mechanization and Motorization: The Final Chapter Has Not Been Written,” The Cavalry Journal 49, no. 217 (January–February 1940): 41.

the automotive pioneer who built the first American car in 1893, observed that people “decry rather than ask for”⁷ technological innovations. Yet, the standard explanation for automotive ubiquity follows a general economic rationalist approach: cars ultimately replaced horses because they were much more affordable, more efficient, and cleaner. But is it simply common sense, albeit following on the heels of initial shock, that ultimately accounts for the widespread diffusion of the automobile? Why did people shun what should have been perceived as a far superior method of transport, not to mention a potential panacea to filthy streets and all sorts of diseases?

To understand what transpires during the early stages of a large-scale technological change and diffusion, I selected motorization as an area of study. I use three cases in automotive history to explore the transition from muscle to motor power. I use a multiple case design for the purpose of theoretical replication.⁸ Each case highlights a particular perspective: the manufacturer, the user, and a combination of both. The motorcar began as a peripheral device and eventually became widely diffused in all three cases. My primary goal is to identify various motivating factors in mass adoption.

Organization of the Dissertation

In Chapter One, I review the dominant literature in technology studies and the history of technology related to automobiling. I identify some gaps in the current use of artifacts, social groups, gender, and price as explanatory devices in understanding diffusion. I look at the notion of practices—routines and processes used to carry out work and social obligations—as a potential unit of analysis to bridge some of these gaps.

⁷ Charles E. Duryea, “As It Was in the Beginning,” *The Automobile*, January 7, 1909, 47.

⁸ Robert K. Yin, *Case Study Research: Design and Methods* (Thousand Oaks, CA: Sage Publications, 1994), 46.

Chapter Two covers the first case of the three-part study. I closely examine the marginality of the motorcar during the first decade of the twentieth century and discuss how mainstream status was eventually achieved. I focus on the efforts of US manufacturers to effect this change through the use of advertisements.

Advertising of this time arguably serves as a mouthpiece for automotive manufacturers⁹ and hence provides evidence of the persuasive measures used to generate mass demand. Manufacturers' manuals and written publications are also included. Consumer magazines provide materials for popular culture, while trade magazines cover general matters related to automobiling.

Chapter Three, the second case study, focuses on how diffusion was achieved in a context particularly hostile to motorization—the United States Cavalry after WWI. Similar to the first case, the motorcar was peripheral to the cavalry world, but unlike the first case, the aversion to the motorcar was not simply a reaction to its novelty, but was a reflection of the centrality of the horse to cavalry life. Motorization represented the demise of the horse—and the consequent dismantling of the cavalry's identity and core principles.

The 1914 Cavalry Service Regulations and the 1916 Cavalry Drill Regulations manuals provide evidence of the extent to which the horse culture was entrenched in the cavalry. The Cavalry Journal, an internal military publication, provides evidence of the various coping mechanisms employed to maintain the equine tradition, which, ironically, led to the conceptualization of the jeep. This case also examines how the jeep was used in actual battlefield conditions from group and individual levels of analysis.

⁹ Pamela Walker Laird, "The Car Without A Single Weakness: Early Automobile Advertising," Technology and Culture, 37, no. 4, October 1996.

Chapter Four, the final case study, examines a combination of perspectives: the manufacturers, the users, and the artifact itself. It traces the transformation of the military jeep into a domesticated, widely used form of public transport in the Philippines. It examines the strength of the local equine tradition and the pervasiveness of socio-religious institutions in simultaneously negating and creating novelty.

I use historical accounts from American expatriates to describe the socioeconomic and cultural state of the Philippines after WWII. Photographs, paintings, and observations from these travelers capture nuances of Philippine commuting life upon the arrival of the jeep. The extensive four-volume Philippine Commission Report of 1900–1901, with transcripts of interviews conducted by American delegates with key local leaders, proved to be a useful primary source in gleaning a sense of the state of roads, infrastructure, horse culture, and practices prior to the arrival of American influence. I have also examined contemporary accounts and reflections of local literary scholars and have supplemented these accounts with phone interviews with local users, conducted in the Ilocano and the Tagalog (Filipino) dialects.

The Conclusion suggests that technological change and diffusion can be understood in terms of the continuity of practices. Pre-existing practices provide an inherent momentum that may constrain or promote the transformation of peripheral artifacts into everyday mainstream devices. The results of this study imply that the promotion of large-scale technological change sometimes involves the counterintuitive measure of keeping certain elements, concepts, and forms “unchanged.” A nascent technological device could benefit from the goodwill earned by its predecessor by assuming, in functionality, physical form, or through rhetoric, some of the successful elements of its predecessor.

Chapter One

Review of Literature

The purpose of this literature review is to show how the concept of practices, namely, ways of doing things, has not been extensively used as a primary focus in research on technological change and diffusion. Research on technology tends to break down its analysis into two major components—people and things. The dynamics of the relationship between the two has been examined through various analytical lenses—those of social groups, networks, gender, economics, technical content, functional features, to mention a few—with the purpose of explaining how an artifact comes to be, or why a certain social order exists. Although studies focusing on people and things complement each other, they differ on many fundamental points, particularly with regard to the agency and impartiality of social actors. Actor-Network theorists and gender scholars, for instance, see artifacts as forces that shape social orders, whereas social constructivists recognize agency among humans exclusively.

Little work has been done, however, to explicate the motivational factors of agency, particularly in cases where an artifact initially deemed ineffective or superfluous becomes a necessity of everyday life—for example, the automobile at the turn of the century. Farmers saw it as a devil wagon but later adopted it for use as an all-around device and power source.¹ Why do social groups change their positions with regard to a particular artifact? How does a marginal artifact come to be accepted as a mainstream device? I argue that pre-existing practices and work routines can be used as explanatory devices to understand diffusion strategies and localization

¹ Ronald Kline and Trevor Pinch, “Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States,” *Technology and Culture* 37 (1996), 763–795.

measures. Understanding the strength of ingrained practices provides insights into the transformative aspects of a technological device as it becomes part of common, everyday routine.

Artifacts

The general public perception of a new technology as the product of a few geniuses has been questioned by researchers such as George Basalla, who sought to emphasize continuity in novelty. Basalla uses the artifact as the fundamental unit of analysis for studying technological evolutions. Changes in the technological world are tracked by looking at things. According to Basalla in The Evolution of Technology, “Novel artifacts can only arise from antecedent artifacts [. . .] new kinds of made things are never pure creations of theory, ingenuity, or fancy.”² Basalla defines novelty as a variation of the old. New artifacts do not emerge solely from an inventor’s imagination but arise from other artifacts. Thus technological change in this model emphasizes a certain dependency on the old. New things must then be understood in a historical context.

Basalla’s theory of technological evolution is characterized by four major concepts: novelty, continuity, diversity, and selection. Basalla defines novelty in terms of creating variations on old things. Drawing on a Darwinian biological worldview, Basalla argues that the modern world spins out new artifacts as a matter of routine and compulsion. New artifacts constantly emerge from the old; thus a definitive link exists between new and existing artifacts. Old artifacts never completely disappear, even when new artifacts emerge to replace them. Consequently, technological diversity

² George Basalla, The Evolution of Technology (Cambridge: Cambridge University Press, 1988), vii–viii.

increases over time. However, certain selection decisions are made about which artifacts are to be fully developed and reproduced.³

Basalla argues that there is no universal criterion for functionality. Each society decides on the usefulness of a particular artifact. People decide which things to keep, use, and replicate from a myriad of artifacts. This decision is not driven by some universal biological need, as a human body needs water. On the contrary, an artifact may be useful to one society but not to another. According to Basalla, “Often it is difficult to determine precisely what is to be done with a new device.”⁴ Things themselves do not force a certain use; nor does the material itself make its application immediately self-evident. This implies that mass appeal requires persuasive measures.

Basalla uses the example of the automobile to illustrate the social construction of technological necessity. The automobile, before its transformation into an indispensable component of everyday life, began as a plaything for the rich during its first decade of existence, 1895–1905.⁵ Basalla emphasizes the fact that the development of the automobile was not motivated by some grave international horse crisis or horse shortage.⁶ Similarly, the motor truck was not a response to some scarcity in horse supply or steam-powered machinery. Rather, “the *invention* of vehicles powered by internal combustion engines gave birth to the *necessity* of motor transportation.”⁷ Things came first, followed by the need for them.

Basalla further supports his argument by stating that the usefulness of the wheel itself, considered indispensable to modern society, was in fact socially constructed. In Mesoamerica from the fourth to the fifteenth centuries, people created miniature wheeled figurines for religious purposes but never put the wheel to practical

³ Ibid., 135.

⁴ Ibid., 139.

⁵ Ibid., 7.

⁶ Ibid., 6.

⁷ Ibid., 7.

use, even though by this time people thoroughly understood its mechanical principles.⁸ Mesoamericans just did not find wheels useful for their type of terrain and thus used them mainly for ritual and ceremonial purposes.⁹

Some aspects of a new technology mimic those of its predecessors despite having no contemporary applications. For example, the traditional cord handles of Congo pottery continue to be replicated in the design of contemporary pottery handles made from clay.¹⁰ Basalla points to anthropology to support this phenomenon:

The regularity with which new materials are handled and worked in imitation of displaced, older ones has led anthropologists to coin a word to designate the phenomenon: skeuomorphism. A skeuomorph is an element of design or structure that serves little or no purpose in the artifact fashioned from the new material but was essential to the object made from the original material.¹¹

Basalla does not explore why old components become incorporated into new artifacts, but he does attribute selection decisions to those he calls “selecting agents,” those “productive individuals capable of making the choices and changes needed to shape the material world as they see fit.” For instance, Basalla attributes the diffusion of the gasoline automobile to a group of Midwesterners who saw an opportunity to exploit their region’s natural and industrial resources. The Midwest was rich in hardwood. It was the nation’s center for carriage and wagon production, with an infrastructure ready to build the body of the car. It also possessed the technical expertise to make stationary gasoline engines. These resources put the Midwest at a competitive advantage for gasoline car production.

Thus, selectors, such as these Midwestern businessmen, are an enterprising group with the potential capacity to choose which artifacts are to be mass produced.

⁸ Ibid., 9.

⁹ Ibid., 8.

¹⁰ Ibid., 107.

¹¹ Ibid., 106–107.

Basalla suggests that any artifact in general could be widely distributed through the sponsorship of a particular, relevant group of selectors.

The selectors do not represent all segments of society nor are they necessarily concerned with the public's welfare. However, they have the freedom to decide which of the competing novelties would be replicated and incorporated into cultural life.¹²

While Basalla touches upon how decisions on technological artifacts are made, he does not fully discuss why the rest of that society would concur. Why would the buying public choose to accept the artifact that the selectors have decided to replicate and diffuse? Basalla attributes the motivations of the selectors to socioeconomic rationalist arguments such as profitability and technical superiority (for example, the superior performance of gasoline cars over steam and electric vehicles for long-distance travel, their lower maintenance cost, and so forth), but takes for granted the motivations of the rest of the society. Why would the rest of the buying public replace their horses simply because a group of Midwestern businessmen decided to produce gasoline cars? Is it simply a matter of survival of the fittest, by which selectors have the capacity to impose their will upon the rest of society?

Although Basalla points to an important observation of the social construction of needs—what one society finds useful may not be found useful by another society—he appears to revert to a Darwinian rationale to explain agreement on the part of the rest of society. Are societies homogeneous and monolithic enough to reach consensus upon what they need—and upon which artifacts from a myriad of options fulfill this need?

While Basalla argues for a social constructivist model to identify the needs of a certain society, the rationale for technological diffusion follows a Darwinian model.

¹² Ibid., 204.

Social constructivist theories, such as the Social Construction of Technology (SCOT), seek to show more complexity in the process of social groups vying for the right to impose their own interpretation on the standardization of an artifact. However, similar to Basalla's view, SCOT also adheres to an idea of technological diffusion as a matter of one group's choice of meaning superseding those of other groups.

Social Groups

The Social Construction of Technology (SCOT) characterizes technological change as a matter of one social group rising above others to impose a standard interpretation on a given artifact.¹³ The unit of analysis in this case is social groups. Similar to Basalla's notion of a voluntaristic approach to technological change, proponents of SCOT argue that humans have the freedom and will to impose meaning on an artifact. However, unlike Basalla, who believes that *artifacts* bring about other artifacts, proponents of SCOT believe that *social groups* bring about technological diversity.

SCOT recognizes in technological change and diffusion three stages, which occur along a process of variation and elimination. The first stage involves the identification of social groups with a stake in the development of a particular artifact; their relevancy is a function of their capacity to influence the artifact's content and form. The second stage, interpretative flexibility, describes how these interpretations conflict with one other. In the final stage, closure and stabilization, one social group's interpretation prevails, and a standard is established.

¹³ Trevor Pinch and Wiebe Bijker, "The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other," in The Social Construction of Technological Systems, ed. Wiebe Bijker, Thomas Hughes, and Trevor Pinch, 17–50 (Cambridge: MIT Press, 1989).

Within this framework, technological change is characterized by a contest of meanings from which one interpretation emerges to shape the technological form of the artifact. Pinch sums up the core of technological change according to SCOT:

The key element is that such groups share a meaning of the artifact—a meaning which can then be used to explain particular developmental paths which the artifact takes.¹⁴

According to SCOT, these potential developmental paths diverge primarily because meanings advocated by each social group differ radically from one another. Each meaning generates a different type of technical content.¹⁵ A primary task of the SCOT analyst is to ensure that the groups are homogeneous with respect to the meanings they represent.¹⁶ All members of a group agree on how a particular artifact should look and function. Thus, in many ways, one social group represents one worldview. According to Pinch and Bijker,

We need to have a detailed description of the relevant social groups in order to define better the function of the artifact with respect to each group. Without this, one could not hope to be able to give any explanation of the developmental process.¹⁷

A group-level analysis becomes the critical piece in explaining technological change and diffusion in the SCOT model. The fundamental assumption is that shared meaning is sufficient to maintain group integrity throughout the developmental process. Bijker, however, in his theory on “technological frames,” points to the difficulty of establishing a tight one-to-one correspondence between the three major

¹⁴ Trevor Pinch, “The Social Construction of Technology: A Review,” in Technological Change, ed. Robert Fox (Amsterdam: Harwood, 1996), 24.

¹⁵ Pinch and Bijker, “The Social Construction of Facts and Artifacts,” 41.

¹⁶ *Ibid.*, 32.

¹⁷ *Ibid.*, 34.

components of SCOT—the relevant social groups, the shared meanings, and the artifact.

Bijker argues that in some instances meanings proposed by one social group are shared by another. One relevant social group may work with various artifacts simultaneously and interpret each of them in the same way. Hence, meanings and social groupings may not have a one-to-one correspondence. For instance, social categories may overlap empirically but differ analytically.¹⁸ Celluloid¹⁹ engineers, for example, may work with a variety of artifacts with different interpretations and still represent one social grouping.²⁰ Conversely, Bijker also argues, relevant social groups may overlap analytically but remain empirically separate. Again in the case of celluloid, chemists, molders, and pressing-machine designers all represent different sociological categories but share the same analytical frame with regard to celluloid.²¹ In this case, people from different occupational groupings have the same interpretation of one artifact.

In the context of newly emerging artifacts, then, how does a SCOT analyst assign a specific meaning to a specific relevant social group without introducing inconsistencies and overlaps? SCOT criteria are rather straightforward: groupings should revolve around shared meanings of a particular artifact. In practice, however, traditional sociological categories such as gender, age, occupation, economic status, and geographic location tend to be used as organizing principles in social groupings. In an environment in which a multitude of newly emerging artifacts exists, finding a reliable method to sort people into different relevant social groupings associated with different interpretations becomes a daunting task.

¹⁸ Wiebe Bijker, *Of Bicycles, Bakelites, and Bulbs* (Cambridge, MIT Press, 1995), 194.

¹⁹ Celluloid is a highly flammable plastic made to substitute for more expensive organic substances such as ivory and tortoiseshell. It is used to make knife handles, billiard balls, and so forth.

²⁰ *Ibid.*, 193.

²¹ *Ibid.*, 192–197.

Instead, Bijker proposes a theoretical framework that breaks the neat classificatory scheme found in SCOT. “The two sides of analysis,” Bijker states, “social groups and technical artifacts,” must be folded into “aspects of one world.”²² Theoretical concepts, according to Bijker, should be “as heterogeneous as the actors’ activities.”²³ But at the same time he proposes a highly restricted model in which actions and interactions are constrained by their technological frame, and thus, “not everything is possible anymore.”²⁴ Bijker seeks to show that social groups and the meanings associated with them are not governed by their interests in artifacts alone but by some other conceptual factors akin to Kuhn’s notion of paradigm.²⁵

Users

As SCOT became known in various academic circles, its applications moved beyond explaining the development of a certain artifact to include how modifications to a finished product occur. Indeed, after the early 1980s publication of Pinch and Bijker’s article on the safety bicycle,²⁶ in the mid-1990s Kline and Pinch wrote “Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States”²⁷ to show how change possibilities persist well beyond the design stage.²⁸ In their study of the Ford Model T, Kline and Pinch focus on the consumption rather than the design stage, with a consequent emphasis on users rather than manufacturers.

Furthermore, although manufacturers may have ascribed a particular meaning to the artifact they were not able to control how that artifact was

²² Ibid., 195.

²³ Ibid., 15.

²⁴ Ibid., 192.

²⁵ Ibid.

²⁶ Pinch and Bijker, “The Social Construction of Facts and Artifacts.”

²⁷ Kline and Pinch, “Users as Agents of Technological Change,” 763–795.

²⁸ Ibid.

used once it got into the hands of the users. Users precisely as users can embed new meanings into the technology.²⁹

Kline and Pinch equate new users embedding new meanings into an artifact with finding new technological applications for an artifact once it has been stabilized. Identifying technological change, in this application of the SCOT model, becomes a matter of recognizing new users applying new sets of meanings to newfound functionalities.

New meanings are being given to the car by the new emerging social group of users—in this case, technically competent farm men. To the urban user the car meant transport. For the rural users we have identified, the car, as well as being a form of transport, could be a farm tool, a stationary source of power, part of a domestic technology, or perhaps all of these.³⁰

Their study suggests that innovation was no longer the exclusive domain of designers and manufacturers. Users could propel changes by advocating for new features in an artifact's functionality, a state of affairs which indicates a certain open-endedness in the model. Indeed, this technological flux is mentioned in Jordan and Lynch's study on the "plasmid prep," a laboratory technique used to insert pieces of DNA into a bacterial medium in order to create genetic material for experimentation.³¹ Jordan and Lynch argue that even in a highly formalized, well established and seemingly straightforward laboratory procedure such as the "plasmid prep," there was a "*continual* genesis of incoherence and fragmentation within the relatively settled development of an established technology."³² Closure and concession were difficult to

²⁹ Ibid., 775.

³⁰ Ibid., 777.

³¹ Kathleen Jordan and Michael Lynch, "The Sociology of a Genetic Engineering Technique: Ritual and Rationality in the Performance of the 'Plasmid Prep,'" in The Right Tool for the Job, ed. Adele Clarke and Joan Fujimura (Princeton University Press, 1992), 79.

³² Jordan and Lynch, "The Sociology of a Genetic Engineering Technique," 84.

establish, even in an area that appears to be an exemplar of standardization, as many studies on users of technology have shown.

In the ten years since the publication of “Users as Agents of Technological Change,” the Kline and Pinch study has attracted subsequent research on users of technology, as evidenced by the recent publication of How Users Matter: The Co-Construction of Users and Technologies, edited by Nelly Oudshoorn and Trevor Pinch.³³ Oudshoorn and Pinch expand on what Kline and Pinch initially sought to illustrate in the Ford Model T study—the possibility of finding new uses for familiar technologies. In this study, adoption becomes deeply tied to the notion of localization. Users become the new designers of stable technologies.

Oudshoorn and Pinch also point to the recent trend in feminist studies of moving away from a technologically deterministic perspective to granting users, particularly women, the capacity to shape technological change. The common perception that women were hapless victims of technology has been modified by the last two decades of scholarship on women as capable users.³⁴ The extent of users’ influence varies depending on their direct control of a particular artifact and their socioeconomic conditions. Implicit in this analysis, and perhaps more explicit in some cases, is a sense of struggle emanating from social groups themselves rather than from the meanings they advocate.

Contrary to the approach of impartiality in SCOT, scholars of gender studies, such as Judy Wajcman, give prominence to power relationships—the dominance of men in the technological world and the disadvantaged position of women. Gender becomes simultaneously an organizing and an explanatory device. The meanings assigned to each social group often tend to be established a priori, not by the features

³³ Nelly Oudshoorn and Trevor Pinch, editors, How Users Matter: The Co-Construction of Users and Technologies (Cambridge: The MIT Press, 2003).

³⁴ *Ibid.*, 4–5.

of the artifact, but by the analyst. One goal that recent gender studies share with SCOT, however, is the desire to debunk the idea of users as passive recipients of technological change.

The notion of users as empowered social groups in recent technology studies may have arisen as a reaction to the traditional approach of crediting sole authority to designers by virtue of their direct access to technological form. In his study on the microcomputer in the late 1980s, for instance, Steve Woolgar argues that computer manufacturers attempt to “configure the user” with features designed to determine the range of user agency. In the view of such designers, form should direct use, and designers should direct users.

For along with negotiations over who the user might be, comes a set of design (and other) activities which attempt to define and delimit the users’ possible actions. By setting parameters for the users’ actions, the evolving machine effectively attempts to configure the user.³⁵

In this framework, designers attempt to control user agency through machine designs, a concept similar to the notion of embedded scripts advocated by Actor-Network theorists such as Madeline Akrich.³⁶ Akrich argues that a “technical object defines a framework of action together with the actors and the space in which they are supposed to act.”³⁷ While Bijker describes the limits of social agency in terms of conceptual frameworks such as “technological frames,” Actor-Network theory attributes constraints to artifacts. Artifacts are not simply the receivers of meanings. Technological diffusion in this model becomes a matter of things becoming taken for granted, or “black-boxed.”

³⁵ Steve Woolgar, “Configuring the User: The Case of Usability Trials,” in A Sociology of Monsters, ed. J. Law (Routledge, 1991), 4.

³⁶ Madeline Akrich, “The De-scription of Technical Objects,” in Shaping Technology/Building Society, ed. Wiebe Bijker Bijker and J. Law (MIT Press, 1992).

³⁷ *Ibid.*, 208.

Black Boxes

Bruno Latour, who pioneered Actor-Network theory with the publication of Science in Action, includes non-human actors in his definition of relevant groups.³⁸ These non-human actors, once they are “black boxed,” diffuse into “thousands of copies all over the world.”³⁹ For example, in his study of the diesel engine, Latour traced the history of the engine from concept development through prototype development, product diffusion, and product recall, to its inventor’s suicide. Latour described the diesel engine during the diffusion stage as “incorporated as an unproblematic element in factories, ships and lorries.”⁴⁰ Diffusion, for Actor-Network theorists, is synonymous with commodification.

According to Latour, if a particular commodity falters, stalls, and breaks apart, it ceases to be taken for granted because people must determine the source of its malfunction. Indeed, mechanics and engineers began opening the black-boxed diesel engines when they began to fail repeatedly.⁴¹ Failure may also result from an artifact’s inability to satisfy user needs, another condition that could prompt the opening of black boxes. Kline and Pinch show how technically competent farmers did not merely accept the Model T, even though it was mechanically sound, but instead modified it in various ways to suit their needs.

In Actor-Network theory, the model of diffusion does not suggest that innovations travel through some inherent force; rather diffusion becomes a matter of eliminating reasons to open black boxes. Diffusion occurs when “people do not do anything more to the objects, except pass them along, reproduce them, buy them, believe them.”⁴² In other words, trust accompanies diffusion as long as artifacts

³⁸ Bruno Latour, Science in Action (Cambridge: Harvard University Press, 1987).

³⁹ *Ibid.*, 105.

⁴⁰ *Ibid.*

⁴¹ *Ibid.*, 106.

⁴² *Ibid.*, 133.

perform reliably and problems go away, a condition that on this particular point resembles the notion of stabilization in the third stage of SCOT.⁴³ In many ways, the last stage of SCOT represents the culmination of an artifact becoming black-boxed.

Is black box status, then, a necessary precursor to technological diffusion? Does flawless technical execution become the primary incentive for users to pick up an artifact and use it? What compels users to adopt an artifact? Actor-Network theory suggests that for adoption to occur, an artifact must enroll the interests of users. As Latour stated, if no player takes up the ball in a game of rugby, “it just sits on the grass.”⁴⁴ Enrollment occurs when various interests and goals become aligned.⁴⁵ This enrollment is so critical that lacking it, an artifact “dies,” as Latour sought to show in his narration of Aramis.⁴⁶

Aramis is the story of France’s failed attempt to create a Rapid Personal Transit (PRT) system that would have combined the workings of a regular railway train with the personal service of an automobile. The basic idea involved creating separate train “cars” to pick up a small number of passengers on demand instead of according to a fixed time schedule typical of a conventional train system. Each train car would monitor its own speed and distance; thus the cars would be physically separate from each other. Each would find the most efficient route for its passengers, bypassing train stations as needed. This method of transportation was designed for people living in the suburbs, where train stations are typically smaller and served less frequently by conventional trains.

⁴³ The later application of SCOT, however, radically departs from Actor-Network theory when it argues that localization, or the reopening of the Model T, became a motivating factor in its adoption on the farm.

⁴⁴ Latour, Science in Action, 104.

⁴⁵ See Chapter 3 in Latour, Science in Action.

⁴⁶ Bruno Latour, Aramis or The Love of Technology, trans. Catherine Porter (Cambridge: Harvard University Press, 1996).

Several sophisticated technological advances were implemented to establish inter-car linkages, such as the use of microprocessors to replace the job of a train conductor. The project spanned almost two decades, from the 1970s to the 1980s, before it dissolved—hence the “death of Aramis.” Latour attributes the death of Aramis to a lack of human sponsors or, in the parlance of SCOT, a relevant social group.

Aramis had been fragile from the outset—we all know that; not fragile in just one respect, in one weak link, as with other innovations, but fragile on all points... Here is our mistake, one we all made, the only one we made. You had a hypersensitive project, and you treated it as if you could get it through under its own steam... If the Budget Office can kill Aramis, what should you do, if you really care about it? Impose yourselves on the Budget Office, force it to accept Aramis. You can't do that? Then don't ask Aramis to be capable of doing it on its own. If elected officials from the south Paris region can kill Aramis, what should you do? Make them change their minds, or get other ones elected. You don't think you have the power? Then don't expect Aramis will.⁴⁷

While Latour pioneered the concept of nonhumans as social actors with their own agency, his analysis of the Aramis project makes a plea for human support in the early stages of technological development. In many ways, Latour subscribes to Basalla's notion that things have inherent momentum, except that for Latour, diffusion is contingent upon non-action by users to “open the black box.” Bassalla argues for a form of material inertia—a compulsion of artifacts to diversity⁴⁸—whereas Latour never separates material agency from the network in which an artifact diffuses.

Thus if technological diffusion for Latour is a matter of an artifact's reaching black box status, then technological change becomes a matter of negotiation among human actors. Indeed, Latour describes technological change as a “process of negotiations between the innovator and potential users” and the manner in which “the

⁴⁷ Latour, *Aramis or The Love of Technology*, 291–292.

⁴⁸ Basalla, *The Evolution of Technology*, vii–viii.

results of such negotiations are translated into technological form.”⁴⁹ These negotiations may be facilitated by what Actor-Network theorists call “mediators.”

According to Akrich, “if we are to describe technical objects, we need mediators to create the links between technical content and user.”⁵⁰ Unlike in the SCOT model, in which social groups by virtue of their relevancy directly influence the content of an artifact, Actor-Network theorists propose a mediator that arbitrates among social groups. Thus, in this model, the mediators, rather than the producers or designers—although supposedly devoid of their own interpretation of a particular artifact—directly control technological changes.

The same basic idea echoes in the notion of “boundary shifters” described in Pinch and Trocco’s Analog Days.⁵¹ Sales people, for instance, are boundary shifters by virtue of their direct access to both manufacturers and users.⁵² “Boundary shifters” are people who “move from one world to the other,” and “apply the knowledge, skill, and experience gained in one world to transform the other.”⁵³ Sales people bring lessons learned from users back to manufacturers, who in turn modify a particular artifact based on user feedback. Sales people as mediators are sometimes users themselves, as exemplified by Pinch’s story of David van Koevering, who sold synthesizers to rock and roll musicians by capitalizing on his own experience as a user of the synthesizer.

Thus an important point shared by SCOT and Actor-Network theorists is that users have some means to transmit their ideas to designers. Users and designers no longer interact on just the material level; mediators provide a communication channel

⁴⁹ Latour, Science in Action, 116.

⁵⁰ Akrich, “The De-description of Technical Objects,” 211.

⁵¹ Trevor Pinch and Frank Trocco, Analog Days (Cambridge: Harvard University Press, 2002).

⁵² Trevor Pinch, “Giving Birth to New Users: How the Minimoog Was Sold to Rock and Roll,” in How Users Matter: The Co-Construction of Users and Technologies, 248.

⁵³ *Ibid.*, 314.

whereby social groups can negotiate without directly influencing an artifact. If such a channel indeed exists and is effectively used, how else do producers explain the concept involved in a new technological artifact? Why would use not be immediately evident, as Basalla observed, if in fact users were part of an artifact's development? For that matter, why would there exist other, competing alternatives?

Gender

Gender studies tend to answer these questions in terms of humans subjugating other humans. Around the time that Woolgar wrote his article on user configuration, Judy Wajcman wrote Feminism Confronts Technology, which proposed that technology is a product of the “distribution of power and resources between different groups in society” and challenged the way social constructivism casts technology as neutral.⁵⁴ Although later studies on gender issues deemphasized the theme of the subjugation of women, the idea of technology as a male dominion resonated in gender literature for many years.

Unlike SCOT, which begins with the assumption that social groups are relatively independent from each other and, to a certain extent, have similar opportunities to impose their meanings on an artifact, gender studies suggest that technologies favor men and place women at a disadvantage. Gender becomes the explanatory and organizing principle of social groups.

As with science, the very language of technology, its symbolism, is masculine. It is not simply a question of acquiring skills, because these skills are embedded in a culture of masculinity that is largely coterminous with the culture of technology. Both at school and in the workplace this culture is

⁵⁴ Judy Wajcman, Feminism Confronts Technology (University Park: Pennsylvania State University Press, 1991), 162.

incompatible with femininity. Therefore, to enter this world, to learn its language, women have first to forsake their femininity.⁵⁵

Wajcman claims that the technological world has essentially been imprinted with a male agenda. Thus the analyst's task is to understand the different ways in which women are subjugated by or excluded from this world. For example, in her analysis of the diffusion of the automobile, Wajcman argues that transportation has the paradoxical effect of restraining women rather than liberating them from their homes.

I will argue that the transport system, and in particular the dominance of the car, restricts women's mobility and exacerbates women's confinement to the home and the immediate locality.⁵⁶

Wajcman uses Langdon Winner's concept of technological determinism⁵⁷ to show how the dependence of American women on modern-day public transport has restricted their access to certain areas, preventing them from taking full advantage of the various economic and social opportunities available in society.

Perhaps the most revealing illustration of the way reliance on public transport can restrict the access of certain groups to public amenities comes from an article called "Do Artifacts Have Politics?" by Langdon Winner (1980).⁵⁸

Winner proposes that technical things—that is, machines, structures, and systems of modern material culture—embody specific forms of power and authority.⁵⁹

⁵⁵ Ibid., 19.

⁵⁶ Ibid., 126.

⁵⁷ Although Langdon Winner takes a nuanced view of the thesis of technological determinism in his Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought (Cambridge, MA: MIT Press, 1978), his later work can be characterized as technologically determinist. Bruce Bimber in his three-part taxonomy on technological determinism characterizes Winner as a technological determinist for having placed "technology at the forefront of social and cultural change." For details, see Bruce Bimber, "Three Faces of Technological Determinism," in Does Technology Drive History?, ed. Merrit Roe Smith and Leo Marx (Cambridge, MA: MIT Press, 1994), 34.

⁵⁸ Wajcman, Feminism Confronts Technology, 131.

⁵⁹ Langdon Winner, "Do Artifacts Have Politics?" in The Whale and the Reactor: A Search for Limits in an Age of High Technology, ed. Langdon Winner (Chicago: The University of Chicago Press, 1986), 80–81.

A technology, as a device and as a system, contains specific arrangements of power that societies use to enforce certain types of social order. For example, the physical arrangement of a particular technology may systematically promote social inequality, as exemplified by Winner's much-cited 1986 case study of the Long Island Bridge,⁶⁰ in which he argued that Robert Moses in the 1950s deliberately and successfully excluded racial minorities and low-income groups from visiting Jones Beach by designing a bridge under which public buses could not pass.⁶¹

Wajcman uses Winner's argument to advance her thesis that things are charged with the means to advance male dominion. Technological development viewed through a gendered analytical lens becomes a matter of identifying the different ways in which technology, in whatever form, subjugates women. Wajcman states, "Even seemingly innocuous technological forms such as roads and bridges embody and reinforce power relations."⁶² Thus artifacts are no longer things to be explained but are, rather, the explanatory variables necessary to understanding the perceived inequality between men and women.

Wajcman attacks the traditional notion of technology that focuses on industrial machinery and men. Instead, she argues for the centrality of technologies associated with women, such as the household devices of everyday life.

I have already argued that the traditional conception of technology is heavily weighted against women. We tend to think about technology in terms of industrial machinery and cars, for example, ignoring other technologies that

⁶⁰ Steve Woolgar and Geoff Cooper in "Do Artifacts Have Ambivalence?" argue that the Long Island Bridge was in fact passable for public buses. Woolgar and Cooper build on Bernward Joerges' study, which question the empirical validity supporting Winner's claims (Bernward Joerges, "Do Politics Have Artifacts?" in *Social Studies of Science* 29, no. 3 [1999]: 411–431). Woolgar and Cooper characterize Winner's Long Island Bridge example as a science and technology studies urban legend. For details, see Steve Woolgar and Geoff Cooper, "Do Artifacts Have Ambivalence? Moses' Bridges, Winner's Bridges and other Urban Legends in S&TS," *Social Studies of Science* 29, no. 3 (1999): 433–449.

⁶¹ Winner, "Do Artifacts Have Politics?" 80–81.

⁶² Wajcman, *Feminism Confronts Technology*, 133.

affect most aspects of everyday life. The very definition of technology, in other words, has a male bias. This emphasis on technologies dominated by men conspires in turn to diminish the significance of women's technologies, such as horticulture, cooking and childcare, and so reproduces the stereotype of women as technologically ignorant and incapable.⁶³

Women's technologies, such as "horticulture, cooking and childcare," center on practices rather than on things. Gender as an analytical lens seeks to expand the traditional definition of technology beyond mere things to a set of work routines. Wajcman's worldview subscribes to the following: first, the world of technology favors men. Second, to participate in this world, women must become like men. Third, although the world favors men, there is such a thing as women's technologies, which appear to be associated with household-related work.

However, even so-called women's technologies ultimately work to improve the lot of men. The labor saved by early household appliances was that of men, not women. For instance, the cast-iron stove eliminated the cutting, hauling, and splitting of wood, all tasks performed by men, but cooking-related tasks, which were performed by women, remained labor-intensive.⁶⁴ Thus whether a technology is designed for men or women, the outcome tends to benefit men because technology as a rule tends to favor men, according to Wajcman's thesis.

However, it is unclear in Wajcman's approach whether it is even possible to have a gender-free technology, and if not, how an analyst is to distinguish between men's and women's technologies. If we accept that the culture of masculinity is coterminous with the general culture of technology, it becomes difficult to separate, analytically or empirically, masculinity from technology.

⁶³ Ibid., 137.

⁶⁴ Ruth Schwartz Cowan, More Work for Mother (New York: Basic Books, Inc., Publishers, 1983), 61.

Judith McGaw sheds some light on this matter by defining feminine technologies as “tools, skills, and knowledge associated with the female majority.”⁶⁵ In her view, technology is associated not just with things but also with skills and knowledge, which include practices and the uses of things. McGaw argues that focusing on women and technology clarifies the idea that technology is ultimately dominated by men.

It is also true that until we began to study women and technological change, we were able to remain unaware and ignorant of technology’s masculine dimensions—we studied inventors, engineers, and entrepreneurs as though they were simply “people,” oblivious to the ramifications of the overwhelming masculine predominance, both numerically and politically, in the so-called technological professions.⁶⁶

McGaw argues along lines similar to Wajcman’s in terms of the general disenfranchisement of women, although McGaw attributes the cause to men themselves as social actors rather than to the things they make. McGaw argues that turning a blind eye to gender issues conceals the fundamental characteristic of the social group that dominates technology—men as technicians.

Indeed, the “old-boy network” has been identified by many women as an exclusive club that helps only men and sometimes even blocks women’s advancement. Law’s description of successful engineers as “heterogeneous engineers” for their ability to maneuver physical as well as social relations⁶⁷ bypasses the issue of gender. It fails to consider how the ability to maneuver physical and social resources may be

⁶⁵ Judith A. McGaw, “Why Feminine Technologies Matter,” in *Gender & Technology*, ed. Nina E. Lerman, Ruth Oldenziel, and Arwen P. Mohun (Baltimore: The John Hopkins University Press, 2003), 15.

⁶⁶ *Ibid.*

⁶⁷ J. Law, “Technology and Heterogeneous Engineering: The Case of the Portuguese Expansion,” in *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, ed. W. E. Bijker, T. P. Hughes, and T. J. Pinch (Cambridge: MIT Press, 1987), 111–134.

attributable to a gender-influenced ability to access those resources, rather than simply to having well-rounded skills.

Cynthia Cockburn argues that technology may in fact be designed to promote precisely this gender-driven agenda. In her study on the early printing industry, Cockburn shows how male workers advocated for the use of the Linotype machine over the Hattersley because the former did not require the use of distribution work typically performed by women or child laborers. Cockburn believes that the heavy lifting required as part of composing work in letterpress printing effectively marginalized women to low-paid finishing jobs such as bookbinding.⁶⁸

Cockburn writes that during the late nineteenth century, some small print shops were run completely by women. Women possessed all of the skills necessary to do composing work and engaged men merely to perform heavy lifting and carrying duties. However, men influenced the development of printing technology such that the control of the typesetting machine required physical strength that effectively kept women out of composing work. Cockburn states:

The bodily strength component of the compositor's craft may be isolated to illustrate the politics involved. Men, having been reared to a bodily advantage, are able to make political and economic use of it by defining into their occupation certain tasks that require the muscle they alone possess, thereby barricading it against women who might be used against them as low-cost alternative workers (and whom for other reasons they may prefer to remain at home).⁶⁹

The size and weight of the printing presses and printed sheets could have been designed to be smaller. Since men typically design machinery with men in mind, Cockburn argues, these machines were made to be either too big or too heavy for the average woman. The net effect of such designs is that women end up with a greater

⁶⁸ Cynthia Cockburn, "The Material of Male Power," in *The Social Shaping of Technology*, ed. Donald MacKenzie and Judy Wajcman (Buckingham, England: Open University Press, 1999), 181–183.

⁶⁹ *Ibid.*, 189.

number of inferior job positions. The more prestigious, highly paid positions require body strength, not just skill, in controlling machines. Cockburn concludes that printing technology was gendered as a result of a male-dominated power-play.⁷⁰

On a similar theme, Ruth Oldenziel's study of the Fisher Body Craftman's Guild during the years from 1930 to 1968 shows how various institutions marshaled economic and cultural resources to enforce a male technical domain in the design and production of automobiles.⁷¹ Oldenziel argues that the Guild socialized boys through various activities such as model-making contests in order to prepare them to become managers and engineers for General Motors (GM). A stereotypical relationship between artifacts, men, and women was characterized as follows:

Men design systems and women use them; men engineer bridges and women cross them; men build cars and women ride in them; in short, a world in which men are considered the active producers and women the passive consumers of technology.⁷²

According to Oldenziel, the world of the passive consumer in the Fisher Body advertisements was conveyed with nontechnical, soft, female imagery, such as the parallelism made between the soft curves of the female body and the contours of the Fisher car. The world of production, on the other hand, was "technical," "hard," and "male."⁷³ When men were encouraged to be consumers, they were still cast as knowledgeable producers and builders.⁷⁴

Women, on the other hand, maintained their passive roles as consumers, or what Oldenziel describes as "receivers of what the boys produced."⁷⁵ Technological

⁷⁰ Ibid., 194–195.

⁷¹ Ruth Oldenziel, "Why Masculine Technologies Matter," in *Gender & Technology*, ed. Nina E. Lerman, Ruth Oldenziel, and Arwen P. Mohun (Baltimore: The John Hopkins University Press, 2003).

⁷² Ibid., 40–41.

⁷³ Ibid., 41.

⁷⁴ Ibid., 50.

⁷⁵ Ibid., 64.

diffusion in this case is explained in terms of women accepting without resistance what men produce. Technological change is completely under the control of men. This general theme of female disenfranchisement can be traced back to Ruth Schwartz Cowan's seminal book, More Work for Mother, published in 1983.

Cowan shows how tools, even those designed for women, did not deliver the promised benefits. They merely recast the types of work women did, rather than freeing them from work itself. According to Cowan, "Modern labor-saving devices eliminated drudgery, not labor."⁷⁶ In her discussion of the automobile, Cowan argues that the American housewife in the 1950s toiled as much as the American housewife in 1850. The only difference was the location where her work was performed: in the 1850s, the housewife was shackled to the stove, while in the 1950s, the housewife was trapped in her car.

The automobile had become, to the American housewife of middle classes, what the cast-iron stove in the kitchen would have been to her counterpart of 1850—the vehicle through which she did much of her most significant work, and the work locale where she could most often be found.⁷⁷

Unlike contemporary women, nineteenth-century women spent little time shopping and ferrying goods to their homes.⁷⁸ Household goods and services, including medical care, were instead delivered directly to them. Even in rural areas, merchandise was purchased through mail-order catalogues and delivered to the home. Retail stores in urban areas provided delivery services and were generally accessible on foot.

However, during the first two decades of the twentieth century, the burden of transporting goods and services shifted from the seller to the buyer.⁷⁹ The automobile,

⁷⁶ Cowan, More Work for Mother, 100–101.

⁷⁷ *Ibid.*, 85.

⁷⁸ *Ibid.*, 79–84.

⁷⁹ *Ibid.*, 85.

according to Cowan, shifted the responsibility of acquiring household goods from men to women.⁸⁰ In this case, the car became “an agent of change,”⁸¹ facilitating the shift in household work from production- to consumption-related activities. The availability of household appliances and ready-made goods replaced the need for hired help. Nevertheless, the American wife remained harried with work, just of a different kind. Consistent with the tenor in gender studies, the car as a masculine industrial machine in Cowan’s analysis worked to benefit the lot of men but not that of women.

Wajcman’s analysis of the automobile as a technology that constrains women was inspired by the work of Cowan. Both propose that the automobile ultimately did not benefit women but instead bound them more tightly to their subservient role. Later scholars such as Virginia Scharff agree that even contemporary housewives spend significant amounts of time ferrying children and goods. Because the automobile has been associated with leisure, household work performed using the car, such as shopping, came to be cast as entertainment rather than a chore, rendering much of modern-day homemaking invisible.⁸²

Indeed, automobiles in their early years provided the means for women to conduct commercial and leisure activities outside their homes with greater freedom and less apprehension. Scharff states,

As such, it seemed to some women a perfect solution to the problem of gaining admission to public life, especially commercial and leisure activities, without exposing oneself to the vagaries and annoyances of public transportation. It opened up the possibility of independent mobility for those who used it. Extending that potential to women meant both expanding the private sphere into the realm of transportation and, paradoxically, puncturing woman’s

⁸⁰ Ibid., 82.

⁸¹ Ibid., 83.

⁸² Virginia Scharff, Taking the Wheel: Women and the Coming of the Motor Age (New York: The Free Press, 1991), 147.

“sphere” by undermining the already strained notion that women’s place was in the home.⁸³

Although Wajzman may have implied that transport technologies were designed to constrict women, Scharff argues that automobiles in their early years extended a woman’s sphere and provided the means for her to leave her home without having to forego privacy and a sense of security. The closed car, for instance, became an extension of a woman’s home, like a living room on wheels⁸⁴ where comfort and convenience came to be associated with feminine features.

Questions of comfort, for the driver and the passengers, lay at the heart of the automobile business debate about woman’s influence. Whenever industry men and male consumers invoked customary notions about feminine behavior, they used the terms “comfort” and “convenience” to cover a spectrum of meanings, from sober concern for safety to lavish luxury.⁸⁵

Scharff argues that automotive manufacturers operated under a gendered assumption that women wanted fluffy features that had nothing to do with automotive performance. Men, on the other hand, were perceived to value exclusively practical features such as fuel economy and horsepower. Scharff claims that because manufacturers thought men and women wanted different things, this caused product differentiation in motorcars. Technological diversity became driven by gender.

Nevertheless, manufacturers tended to associate the qualities of comfort, convenience, and aesthetic appeal with women, while linking power, range, economy, and thrift with men. Women were presumed to be too weak, timid, and fastidious to want to drive noisy, smelly gasoline-powered cars. Thus at first, manufacturers, influenced by Victorian notions of masculinity and femininity, devised a kind of “separate spheres” ideology about automobiles: gas cars were for men, electric cars were for women.⁸⁶

⁸³ Ibid., 24–25.

⁸⁴ Cowan, More Work for Mother, 125.

⁸⁵ Scharff, Taking the Wheel, 127.

⁸⁶ Ibid., 36–37.

Scharff suggests that this gendered worldview initially fragmented the automotive market. The gender bias of manufacturers resulted in sex-specific advertising campaigns. At the same time, Scharff recognizes buying power as gender-free.

However, when automotive designers and promoters, acting in part under the influence of cultural imperatives regarding gender, coupled these desirable attributes with the electric's limited power and circumscribed range, they misread their audience. No law of nature dictated that automobiles could not be designed to be comfortable, reliable, handsome, and powerful, qualities that might appeal to men and women alike. And even if automakers continued to insist that males and females had different automotive preferences, a sex-specific promotional strategy made very little business sense in an economy where consumers, male or female, had some choice, and where families buying only one vehicle were likely to have to accommodate male drivers who were presumed to want to go farther and faster than their female counterparts.⁸⁷

Hence the manufacturers' gendered worldview, according to Scharff, was not ultimately economically sustaining, nor did it make business sense. Although Scharff acknowledges that men at this time typically made most major purchasing decisions, she characterizes paying customers, regardless of their gender, as having the same economic weight in the market.

While arguing the existence of gender division in the marketing campaign of manufacturers, Scharff simultaneously negates this division by arguing that universal values such as the power of the pocketbook and the common desire for comfort and aesthetics ultimately superseded gender bias. Scharff proceeds to argue that if manufacturers had incorporated homey features of comfort into the automobile early on, they would have attracted mainstream buyers sooner:

Had manufacturers recognized the benefits of providing mobile shelter from the beginning of the automotive era, the private auto might have made a more rapid transition from "pleasure car" to practical means of daily transportation

⁸⁷ Ibid., 44.

for middle-class workers, both those employed outside the home and those who pursued a domestic vocation.⁸⁸

To a certain extent, Scharff attributes significant control to manufacturers. In arguing that their actions, though uninformed, ultimately determined the timing of the diffusion of the motorcar, Scharff inevitably paints a profile of automotive manufacturers as powerful, though mildly ignorant, for their capacity to facilitate or negate the diffusion of the gasoline automobile. Scharff softens this categorization by arguing that there were other manufacturers and businesses who, more in tune with the emerging automotive market, took early advantage of the economic opportunities active women drivers represented.

Defenders of women drivers have never been as numerous as detractors. Given the potential market that women drivers represent, those supporters have, not surprisingly, included many people who produce and sell automobiles and automotive products and services.⁸⁹

Thus, on the one hand, Scharff discusses the disenfranchisement of women due to gender bias among manufacturers; on the other hand, she qualifies this position by indicating that some manufacturers saw things differently. Still, she also argues that even others with gender bias changed their thinking: “In an effort to keep up with consumers’ changing demands, producers would at once modify their notions of gender and the machines they made.”⁹⁰ Are consumer buying power and taste, then, ultimately the drivers of technological change?

Scharff argues that women drivers themselves began to break their own gender biases. “As men registered their indifference to the electric, women were demonstrating their own unwillingness to leave long-distance touring and high-speed

⁸⁸ Ibid., 123.

⁸⁹ Ibid., 33.

⁹⁰ Ibid., 46.

driving to men.”⁹¹ Scharff departs from the traditional gender-studies approach of assuming the dominance of men in the technology world at all levels. Rather, she argues that economic forces overpower gender biases.

The electric car, marketed primarily as a woman’s vehicle, provides a striking example of the influence of gender ideology on automotive production. Paradoxically, the electric’s failure also illustrates the impossibility of maintaining rigid gender distinctions in motorcar technology at a time when a declining proportion of customers could not afford the luxury of his-and-hers automobiles, and where in any case consumers shared certain preferences regardless of sex.⁹²

Thus what began as a masculine machine came to incorporate “feminine” features, such as the electric starter, which all users, including men, came to appreciate. Herein lies the contribution of women to the diffusion of the gasoline automobile: the standard automobile became user-friendly for all.

The self-starter, the device that would replace the crank, offered advantages to all motorists, but nonetheless began its automotive career marketed as a supposedly feminine accessory akin to doors designed to accommodate long skirts.⁹³

Technological diffusion in this case became a matter of dissolving what had previously enforced gender stereotypes. The push for feminine values that came to be appreciated by men, such as comfort and convenience, inspired the standardization of the automobile.

Manufacturers who adopted the self-starter made driving easier for all motorists. They also redefined the boundary between men’s and women’s automotive spheres, no longer identified as the distinction between gas and electric motorcars.⁹⁴

⁹¹ Ibid., 42.

⁹² Ibid., 50.

⁹³ Ibid., 58.

⁹⁴ Ibid., 60.

Scharff in many ways sought to show that although manufacturers may have had direct control over the way technological artifacts were initially used, they eventually had to bow to consumers and their buying power. Cowan makes a similar observation when she points to the notion of “market acceptance,” which advertisers must consider when selling different kinds of household appliances for economic profit.⁹⁵ She states, “The machine that was ‘best’ from the point of view of the producer was not necessarily ‘best’ from the point of view of the consumer.”⁹⁶ Thus advertisers must work to court the buying public by providing features they want at a price they are willing to pay.

Indeed, Kline and Pinch point to general socioeconomic factors that facilitated the diffusion of the Model T, such as support from farm leaders; use of media such as advertisements, editorials, and articles; road improvements; general economic prosperity among farmers; and the affordability and availability of cars as a result of mass production methods.⁹⁷ But is technological diffusion ultimately explained by economic choices? In the next section, I focus specifically on the limitations of socioeconomic and technical factors as drivers of the diffusion of the automobile.

History of the Automobile

Historians such as Berger and Flink emphasize the technical and economic advantages of the motorcar over the horse. Berger argues that “the economic argument in favor of the animal had little validity when one considered the time saved, the increase in potential haulage per vehicle, and the reserve power always available with the automobile.”⁹⁸ According to Flink, “The motorcar was considered cleaner, safer,

⁹⁵ Cowan, More Work for the Mother, 102.

⁹⁶ *Ibid.*, 143.

⁹⁷ Kline and Pinch, “Users as Agents of Technological Change,” 772–773. Also in Ronald Kline, Consumers in the Country: Technology and Social Change in Rural America (Baltimore: John Hopkins University Press, 2000), 63–64.

⁹⁸ Michael L. Berger, The Devil Wagon in God’s Country (Hamden, CT: Archon Books, 1979), 34.

more reliable, and more economical than the horse. The car promised to be vastly improved and lower in price in the near future, while the expense and liabilities of the horse seemed insurmountable.”⁹⁹ From a commercial and performance standpoint, this argument assumes that common sense accounts for the diffusion of the automobile because it was cheaper and better than the horse.

Indeed, Flink states that “the inability of the industry to produce a low cost vehicle in sufficient quantity was all that prevented the rapid disappearance of the horse in American cities.”¹⁰⁰ Flink seems to suggest that the diffusion of the motorcar and the consequent disappearance of the horse largely depended upon the automotive industry’s ability to produce a low-cost vehicle in mass quantities. People appear to have been poised to make a purchase as soon as an affordable motorcar became available. Flink himself considers the motorcar to be cleaner, safer, more reliable, and more economical than the horse—in other words, a common-sense choice.

However, many people at the turn of the century disdained the general idea of driving something inanimate. They did not see in the motorcar the advantages that Berger and Flink describe and thus would not have conceivably purchased, at any price, something they despised. If indeed the superiority of the motorcar was self-evident, why would certain social groups adamantly refuse to replace their horses even decades after the motorcar was first introduced? As late as 1940, a United States Army colonel described the military’s reservations about replacing the horse with something lifeless. “A machine has no life; horses have—that is the radical difference.”¹⁰¹

⁹⁹ James J. Flink, The Car Culture (Cambridge: MIT, 1975), 35. Also in Flink, The Automobile Age (Cambridge: MIT, 1988), 138.

¹⁰⁰ James J. Flink, America Adopts the Automobile (Cambridge: MIT, 1975), 53. See also Flink, The Car Culture, 35, and Flink, The Automobile Age, 138.

¹⁰¹ Colonel H. S. Stewart, “Mechanization and Motorization: The Final Chapter Has Not Been Written,” The Cavalry Journal 49, no. 217 (January–February 1940): 41.

The fundamental concept of a lifeless transport has been overlooked in the analysis of historians of the automobile. Indeed, the introduction of motorcars to public roads at the turn of the twentieth century caused much public consternation; not only in rural¹⁰² but also in urban areas people saw them as aberrations—abnormal and dangerous.¹⁰³ Given the public’s reaction, then, how was a detested devil wagon transformed into a widely used machine?

Still, many historians, such as Flink, fail to consider conceptual elements and instead, suggest price as a barrier to diffusion. There is an implicit assumption that once automobiles were mass-produced, the motorcar *must* inevitably replace the horse, because it was simply assumed to be what people wanted; after all, in the mind of the analyst, it was the *obvious* choice. However, evidence suggests that affordability was far from being the main barrier to mass consumption.

As early as 1898, a pro-car observer insisted that a petroleum canopy cart carrying two passengers priced at \$600 brand new was “infinitely cheaper than horses.”¹⁰⁴ Many motor buggies, particularly around the period from 1907 to 1908, were advertised to be “cheaper than horses.” Secondhand dealers and brokers offering affordable used automobiles were already advertising in several magazines by this time. An observer in 1905 noted that it was comparatively easy to find a second-hand car of “almost any type at a price very much below its original cost, and in many cases at figures that are really absurdly low.”¹⁰⁵ High prices in these early days do not appear to have been as significant a deterrent to adoption as many believe.

¹⁰² For discussions on the anti-car crusade, see Kline, Consumers in the Country, esp. chapter 2. Also, Kline and Pinch, “Users as Agents of Technological Change,” 768–773.

¹⁰³ Charles E. Duryea, “As It Was in the Beginning,” The Automobile, January 7, 1909, 47.

¹⁰⁴ Henri Dumay, “The Locomotion of the Future,” Collier’s, July 30, 1898, 23. Many promoters of the automobile consistently argued that cars were cheaper than horses. However, many pro-horse groups argued to the contrary.

¹⁰⁵ “Cars New and Second-hand,” The Automobile, August 3, 1905, 147.

Some scholars, such as Clay McShane, emphasize public health over economics, arguing that the organic aspect of horses proved a major disadvantage when compared with motorcars. Horses were vulnerable to disease and death, as exemplified by the Great Epizootic in 1872, which paralyzed the entire city of Boston. Horses were significantly limited in strength and endurance compared to machines, particularly in the hauling of freight. They had a shorter life expectancy compared with cars. They ate prodigiously even when not in use; caused sanitation and pollution problems due to their droppings; created traffic congestion due to their bulky size, and even caused traffic accidents because they spooked easily.¹⁰⁶ But if the advantages of the automobile were glaringly obvious, particularly in matters regarding public health and safety, why did government officials institute strict motor laws that discouraged the use of automobiles in the first decade of the twentieth century? Why were mainstream users reluctant to replace their horses?

Ogburn proposed that various parts of a modern culture develop at different rates; hence some parts may change more rapidly than others, resulting in what he calls a “cultural lag.”¹⁰⁷ The driver of change, or what Ogburn called material culture, as an independent variable forces another part of the culture, the adaptive culture, to adjust to a new set of conditions.¹⁰⁸ Failure of the adaptive culture to keep pace with change causes strain in the system. According to Ogburn,

The independent variable may be technological, economic, political, ideological, or anything else. But when the unequal time or degree of change produces a strain on the interconnected parts or is expressed

¹⁰⁶ Clay McShane, Down the Asphalt Path: The Automobile and the American City (New York: Columbia University Press, 1994), 41–56.

¹⁰⁷ William F. Ogburn, Social Change (New York: The Viking Press, 1922), 200–201.

¹⁰⁸ *Ibid.*, 211–213.

differently when the correlation is lessened, then it is called a cultural lag.¹⁰⁹

Thus in this framework, Ogburn would attribute the presence of horses to a “cultural lag” that eventually becomes corrected. While Ogburn did not specifically analyze horses versus automobiles, he did use the example of automobiles and highways to illustrate his point. He stated, although historically inaccurately, that automobiles and highways were two parts within the same culture that were in proper balance in 1910; the automobile was slow and the highways were narrow. “The automobile,” Ogburn stated, “traveled at not a great rate of speed and could take the turns without too much trouble or danger.”¹¹⁰

“But as time went on,” Ogburn further stated, “the automobile, which is called an ‘independent variable,’ underwent many changes, particularly the engine, which developed speeds capable of sixty, seventy, eighty miles an hour, with brakes that could stop the car relatively quickly[. . .] The old highways, the dependent variable, are not adapted to the new automobiles, so that there is a maladjustment between the highways and the automobile.”¹¹¹ Thus the corresponding adjustment of wider and longer roads resulted from the pressure to accommodate advances in automotive performance.

What Ogburn failed to consider, however, was that the motorcar engine was not the factor that determined how fast people drove, for cars were already considered too fast and too dangerous well before 1910—fast and dangerous enough that traffic laws and regulations were instituted to set speed limits. Judges meted out heavy fines and penalties to reckless drivers. Ogburn overlooked the influence of governmental intervention through public policies and the manner in which legal controls such as

¹⁰⁹ William F. Ogburn, On Culture and Social Change (Chicago: The University of Chicago Press, 1964), 91.

¹¹⁰ Ogburn, On Culture and Social Change, 86.

¹¹¹ *Ibid.*, 86–87.

traffic laws address the so-called “maladjustments.” To what extent and at what speed a certain technological artifact is incorporated into society appears to be determined by more than technological factors alone.

Thus it was not simply a matter of society being governed by some coherent technological system in which one element must play catch up with another element. Bijker and Law have even argued that technological artifacts themselves do not evolve out of some inner scientific or technical logic but rather are shaped by a range of various contingencies, such as economic, professional, technical, and political factors.¹¹² As Bijker and Law inquired about technologies, “Why did they *actually* take the form that they did?”¹¹³ What explains the relationships between various elements in a sociotechnological world?

In The Railway Journey, Wolfgang Schivelbusch argues that train cars were purposely designed to resemble horse-drawn carriages to assure British railway passengers, particularly the upper class, of a familiar riding experience despite the change in locomotion. Even though railways were fundamentally different from highway roads,¹¹⁴ efforts to make train cars look and feel more like horse drawn carriages came as an attempt to negate the unfamiliarity of riding in a new form of transport.

The traveling situation of the more privileged classes was entirely different: their carriages looked like coaches mounted on rails. Not only was this design forgetful of the industrial origin and nature of the railroad, it was a literal attempt to repress awareness of them. The compartment, an almost unaltered version of the coach chamber, was designed to reassure the first-class traveler (and, to a lesser degree, the second-class traveler as well) that he was still

¹¹² Wiebe E. Bijker and John Law, “General Introduction,” in Shaping Technology/Building Society: Studies in Sociotechnical Change, ed. Wiebe E. Bijker and John Law (Cambridge, MA: MIT Press, 1994), 3.

¹¹³ *Ibid.*, 3.

¹¹⁴ Wolfgang Schivelbusch, The Railway Journey: The Industrialization of Time and Space in the 19th Century (Berkeley: The University of California Press, 1986), 84.

moving along just as he did in his coach, only at less expense and greater speed.¹¹⁵

No consideration, however, was made for the lower class passenger. The open boxcars for the less-privileged travelers immediately brought industrial progress to their riding experience.¹¹⁶ The upper class too, despite the camouflage of train cars, felt “like mere parcels,”¹¹⁷ mere objects of an industrial process.¹¹⁸ They felt “converted from a private individual into one of a mass public—a mere consumer.”¹¹⁹

While Ogburn described cultural lag as a matter of the old trying to catch up with the new, Schivelbush shows how new technological forms purposely couch themselves in terms of the old to make new experiences more palatable. The effort to continue the traditions of horse carriages in the design of train cars persisted despite their ineffectiveness.

As far as I know, in Europe there were no attempts to create a passenger car that would be compatible in its form with the modern technology of the railroad—i.e., one that would no longer have anything to do with the coach-driven compartment.¹²⁰

Thus social relations and experiences, rather than technological homogeneity, ultimately shape nascent technologies.

Would the acceptability of new technologies then hinge upon their resemblance to their predecessors? While Basalla, and to a certain extent Schivelbush, noted that skeuomorphic elements in new artifacts serve little or no functional purpose,¹²¹ their effects on technological diffusion have not been studied. The replication of old technological forms as a means to reenact old experiences may

¹¹⁵ *Ibid.*, 72.

¹¹⁶ *Ibid.*, 72.

¹¹⁷ *Ibid.*, 72–73.

¹¹⁸ *Ibid.*, 73.

¹¹⁹ *Ibid.*, xiv.

¹²⁰ *Ibid.*, 84.

¹²¹ *Ibid.*, 106–107.

conceivably help the introduction of a novelty. Could manipulation of technological forms then be used to control social experience?

Noble's study of machine tools shows how the purposeful use of technology to change social relations does not follow a simple cause-and-effect rule.¹²² In his study of programmable machine automation, Noble argues that the upper management of a General Electric factory attempted and failed to use technology to enforce a certain social order that would reduce their dependence on workers.¹²³ The choice to cut metals using a numerical control machine (N/C) rather than a record playback (R/P) was motivated by GE management's desire to gain greater control on the shop floor. In the record playback system, the machinist, using blueprints, has to cut the first model piece, which the automated machine then replicates. In the numerical control system, the first model piece is cut using mathematical models that circumvent the machinist. A programmer creates in precise mathematical and algorithmic terms the "sight, sound and feel" of an "automatic machinist."¹²⁴

The numerical control (N/C) system developed through massive financial support from the air force supposedly eliminated the possibility of having the blueprints stolen by subversives and spies at a time when communist phobia was particularly high. Managers would now, in theory, have greater control over the production process. However, managers found that the new numerical control machines still needed skilled machinists to produce a good finished product. The machines and their software programs were not always reliable and still required the presence of skilled workers along the production process. Control over the machinery,

¹²² David Noble, "Social Choice in Machine Design: The Case of Automatically Controlled Machine Tools," in The Social Shaping of Technology, ed. Donald MacKenzie and Judy Wajcman, 161–176.

¹²³ David F. Noble, Forces of Production: A Social History of Industrial Automation (New York: Alfred A. Knopf, 1984), 248, 265–266.

¹²⁴ Noble, Forces of Production, 84.

despite efforts to circumvent it, remained in the hands of the workers. Status quo reigned. Noble argues:

Although the evolution of a technology follows from the social choices that inform it, choices which mirror the social relations of production, it would be an error to assume that in having exposed the choices, we can simply deduce the rest of reality from them.¹²⁵

Indeed, while N/C initially appeared to provide the company with a powerful means to control work force productivity,¹²⁶ management later found that machines could not run by themselves but depended upon the skill, initiative, and goodwill of human workers.¹²⁷ The effort to impose a new social order using new technology failed to succeed because of the machine's inability to completely replicate the practices of skilled laborers. Hence, pre-existing practices from old work routines persisted through the new technological form.

However, some analysts of technology, such as Latour, argue that machines could replace human work because the lack of discipline and reliability among humans has to be compensated for, and put into order, using nonhuman instruments—a way of thinking akin to that of GE's upper management. Humans are supposedly substandard in performing certain tasks. In his example of the hinge-pin or door-closer, Latour described how this nonhuman device, “delegated with human characteristics,” made a compliant substitute for a porter. Mechanization in Latour's view becomes a matter of machines being upgraded and reskilled to compensate for humans being displaced and deskilled.¹²⁸ Is the machine, then, a “better” human worker?

¹²⁵ Noble, “Social Choice in Machine Design,” 172.

¹²⁶ Noble, Forces of Production, 265–266.

¹²⁷ *Ibid.*, 276.

¹²⁸ Latour, Aramis or The Love of Technology, 301.

Hubert L. Dreyfus, in What Computers Can't Do: A Critique of Artificial Reason, argues that “machines cannot be like human beings,” but that “human beings may become progressively like machines.”¹²⁹ Dreyfus points to the fundamental difficulty of exhausting all possible human actions and situations in programming a machine to comprehensively mimic human behavior.¹³⁰ Pinch also alludes to the failure of machine-like instruments to capture the creativity required in music-making, or what he would describe as the impossibility of machines to capture the “irredeemable human features of musicianship.”¹³¹

A human mind can easily sort relevant and irrelevant data, whereas a computer must be instructed, in every circumstance, how to treat each variation in input; hence, the impossibility of having, in Noble's term, an “automatic machinist.” Tasks must be greatly simplified, in minute detail, in order to be mechanized. As Noble argues, efficiency in a machine factory could only result from simplifying the work itself.¹³²

Dreyfus argues that if the mind were made to work more like machines rather than vice versa, then it would be possible to create an intelligent machine that could substitute for humans.¹³³ However, the human brain does not function like a machine;¹³⁴ thus, pushing for a thinking machine could potentially result in the propagation of subintelligent human beings rather superintelligent computers.¹³⁵ In other words, it is more feasible for humans to become like machines rather than vice versa.

¹²⁹ Hubert L. Dreyfus, What Computers Can't Do: A Critique of Artificial Reason (New York: Harper & Row, 1972), 192.

¹³⁰ Dreyfus, What Computers Can't Do, 41.

¹³¹ Trevor Pinch and Karin Bijsterveld, “‘Should One Applaud?’ Breaches and Boundaries in the Reception of New Technology in Music,” Technology and Culture 44, no. 3 (2003), 557.

¹³² Noble, Forces of Production, 57.

¹³³ Dreyfus, What Computers Can't Do, 99.

¹³⁴ *Ibid.*, 137.

¹³⁵ *Ibid.*, 192.

Harry Collins subscribes to the same idea as Dreyfus in arguing that human work must be deskilled, or immensely simplified, in order for machines to take over.¹³⁶ Contrary to Latour's argument that machines are reliable substitutes for humans, Collins argues that humans must compensate for the deficiencies of artifacts in order for machines to be able to replace the work performed by workers. Indeed, Noble's study on machine tool automation supports Collins's argument on the need to translate human work into simplified tasks that machines would be able to replicate without error.

Collins also points to the difficulty of replicating even routine human work. For instance, similar to the difficulty of sorting relevant and irrelevant data, work that appears simple in fact requires complex programming. An automotive assembler knows, without giving it a thought, that debris must be removed first before mounting the wheel,¹³⁷ whereas computers must be programmed for all possible variations, as Dreyfus points out, in order to account for anything that could possibly go wrong. As Collins states, "So long as acts can go on without disturbance, machine-like acts could be reproduced."¹³⁸ However, such circumstances are rarities rather than the norm.

Domestication of Technology

Scholars in the field of communication, such as Silverstone, argue that technology in fact occurs not in small, controlled environments but "in multiple domains and in uneven and often contradictory ways."¹³⁹ While Silverstone studies household-related technology rather than production-related technology, he seeks to

¹³⁶ Harry M. Collins, Artificial Experts: Social Knowledge and Intelligent Machines (Cambridge, MA: MIT Press, 1990), 221.

¹³⁷ *Ibid.*, 35.

¹³⁸ *Ibid.*, 39.

¹³⁹ Roger Silverstone, Media, Technology and Everyday Life in Europe: From Information to Communication (Aldershot, England: Ashgate Publishing Limited, 2005), 14.

show the importance of human activities in the notion of technology.¹⁴⁰ Feminist scholars have argued for a broader definition of technology that includes work routines and activities. Similarly, communication scholars have investigated the importance of practices, particularly in the way people incorporate new technology into everyday life.¹⁴¹

As Schivelbush observes with train cars mimicking designs of horse-drawn carriages, Silverstone also argues that technology must be mediated in order to be accepted,¹⁴² requiring some form of acclimation and ownership.

Domestication does, perhaps literally, involve bringing objects in from the wild: from the public spaces of shops, arcades and working environments; from factories, farms and quarries.¹⁴³ [. . .] One can think of domestication too, as both a process by which we make things our own, subject to our control, imprinted by, and expressive of, our identities; and as a principle of mass consumption in which products are prepared in the public fora of the market.¹⁴⁴

Silverstone suggests that domestication of technology involves a movement of goods from the public sphere into the private world. Similar to the idea of localization, things must be made to become one's own such that they become taken for granted and hence "invisible."

The domestication of technology refers to the capacity of a social group (a household, a family, but also an organization) to appropriate technological artifacts and delivery systems into its own culture—its own spaces and times, its own aesthetic and its own functioning—to control them, and to render them more or less 'invisible' within the daily routines of daily life.¹⁴⁵

Silverstone argues that technology, as a cultural product, must be appropriated in everyday normal life. In many ways, Silverstone's model argues for the immediate

¹⁴⁰ Roger Silverstone, *Television and Everyday Life* (London: Routledge, 1994), 81.

¹⁴¹ Silverstone, *Media, Technology and Everyday Life in Europe*, 1.

¹⁴² *Ibid.*, 17.

¹⁴³ Silverstone, *Television and Everyday Life*, 98.

¹⁴⁴ *Ibid.*, 174.

¹⁴⁵ *Ibid.*, 98.

need to neutralize newness in technologies—people tend to make new things familiar in order to fit them into their daily socio-cultural life and functioning. Thus the implication of Silverstone’s thesis is that the lifespan of new technologies does not last. New things are injected with old, familiar elements in order to be absorbed and hence, domesticated.

Conclusion

I argue that, similar to the notion of the continuity of artifactual designs in Basalla’s theory of technological evolution, some elements are carried over from old to new technological artifacts. However, unlike Basalla, I suspect that these elements are not superfluous. Indeed, the effort to conjure old experiences through a new technological medium has been observed by Schivelbush. Train cars were made to look like horse-drawn coaches in order to “repress”¹⁴⁶ the “awareness” of a new transport vehicle, which in turn made the new riding experience less threatening because of its newness.

Making new technologies familiar resembles Silverstone’s notion of achieving invisibility,¹⁴⁷ such that new technologies in essence become part of the woodwork of people’s everyday lives. Achieving this “invisibility” may mean achieving black box status, or being taken for granted, such that an artifact is no longer questioned, noticed, or tinkered with, but is simply accepted and used without much thought or question. Indeed, the concept of invisibility has also been used by Scharff to describe the taken-for-grantedness of work performed by women using automobiles.¹⁴⁸

The inertia of work routines may shed light on why women, as gender studies have argued, accept as normal the persistence of the same heavy burden of household-

¹⁴⁶ Schivelbusch, *The Railway Journey*, 72.

¹⁴⁷ Silverstone, *Television and Everyday Life*, 98.

¹⁴⁸ Virginia Scharff, *Taking the Wheel: Women and the Coming of the Motor Age* (New York: The Free Press, 1991), 147.

related work despite the plethora of modern appliances available. Focusing on practices may also provide the necessary insight into how enrollment occurs as the new is packaged and associated with the goodwill earned by old technologies. One could argue that even things possess reputation; new technologies appropriate from past or pre-existing technologies to project a reputable image. Perhaps these types of associations provide currency on how public consensus could be reached, particularly for controversial new technologies such as the motorcar at the turn of the twentieth century.

However, the use of practices as the focus of this analysis is not a matter of tracing movements and actions, as described by Siegfried Giedon in Mechanization Takes Command.¹⁴⁹ Giedon writes that during the nineteenth century, movement in all its forms, such as the gait of the horse, the flights of insects, and the pulses of a heartbeat, was rendered in graphic form.¹⁵⁰ Scholars using various devices copied, point by point, the trajectories of human and animal muscle movement. Such analysis focused on the nature of movement rather than on its pragmatic use.

This dissertation focuses primarily on practices as ways of doing things, as work and social routines. As Collins, Noble, and Dreyfus point out, the inexhaustibility of *intelligent* human movement such as work skills cannot be successfully replicated by machines. Just as gender studies seek to expand the definition of technology to include work practices, this study proposes that focusing on past practices manifested through articulations in the designs and operations of a new technological artifact may provide insights into why the motorcar, despite its affordability and supposed superiority in performance to the horse, was not

¹⁴⁹ Siegfried Giedon, Mechanization Takes Command: A Contribution to Anonymous History (New York: Oxford University Press, 1948).

¹⁵⁰ *Ibid.*, 17–30.

immediately adopted but was in fact disdained by the general public and by many state government officials during the initial decades of the twentieth century.

Economic rationalist arguments do not explain why price was not an issue for adoption, nor do they explain the strong reluctance of users to replace the horse with the motorcar. If mediators or boundary shifters, on the other hand, can be perceived as change agents, their influence does not explain how consensus on interpretation was achieved on a wide scale. What ultimately brings about widespread diffusion? In the next three chapters, this study examines three cases in three different time periods and settings to understand and verify pre-existing practices as explanatory devices for technological change and diffusion.

Chapter Two

Case One: Domesticating the Devil Wagon: Interchangeability of Muscle and Motor Power

How does a peripheral object turn into a mainstream device? The first case of this three-part study centers on the US automotive history during the first decade of the twentieth century, when people were just beginning to grapple with the idea of a horseless carriage. I focus on this period to capture some of the dynamics involved in marshalling consumer demand prior to mass production. This study assumes that by 1910, mass consumption of the automobile was underway. The study focuses on technological diffusion, and the US provides a conspicuous example because of its strong car culture.¹

What were the issues involved in facilitating the diffusion of the motorcar? The automobile at the turn of the century was not only new in form; it was associated with rich outlaws, rogue chauffeurs, and other non-mainstream groups. How did this newfangled machinery of dubious functionality and reputation find its way into the lives of a new, rising consumer class? This study focuses on the first decade of the twentieth century with the intent of capturing the automobile's peripheral status and the various measures adopted to overcome it.

Although the widespread dissemination of the automobile may be attributed to the Model T Ford in 1908 and its assembly-line production, this causal explanation assumes that mass production brought about mass consumption. Throughout industrial Europe in the 1920s and 1930s, European manufacturers possessed the same technical

¹ For details on the car culture of the United States, see James J. Flink, *The Car Culture* (Cambridge: MIT Press, 1975).

capabilities as the Americans, but the success of the automobile in the US was not replicated in Europe.² The demand for cars was not present. How was the desire to own cars created among mainstream American consumers?

This study makes the assumption, as proposed by John B. Rae, that if mass production is to succeed, mass consumption must already either exist or be poised to be generated.³ To understand mainstream consumer issues, this study reflects upon printed advertisements in consumer magazines. Although printed advertisements reflect the producers' version of consumers and their interests, they provide information on the types of strategies used to transform the newly emerging motorcar into a popular means of transport.

At the turn of the century, advertisements began to exert great influence in American life.⁴ Ruth Cowan, in her study of the mechanization of household implements, argues that advertising lies at the "juncture" between social change and technological change.⁵ No longer dependent on general merchants to market their products, manufacturers accessed consumers directly through advertising, shaping their needs, instilling brand awareness, and opening up new avenues for consumer spending.⁶

Advertising provided the means to sell magazines at cost or less, which allowed publishers to dramatically increase readership and extend their reach to

² John B. Rae, "The Rationalization of Production," in Technology in Western Civilization, ed. Melvin Kranzberg and Carroll W. Pursell, Jr. (New York: Oxford University Press, 1967), 49.

³ Rae suggests that Europe's lack of market demand failed to sustain the English "rationalization" program or Germany's "Fordismus" (Ibid.). Presumably, other automotive infrastructure systems found in industrial America at this time, such as the distribution and repair service systems, did not materialize in Europe precisely because of the absence of market support. Thus, if a market does not have sufficient demand capacity, mass production will not materialize or, at least, be sustainable, as exemplified by Europe in the 1920s–1930s.

⁴ Frank Luther Mott, A History of American Magazines 1885–1905 (Cambridge: Harvard University Press, 1957).

⁵ Ruth Schwartz Cowan, "The Industrial Revolution in the Home," in The Social Shaping of Technology, Donald MacKenzie and Judy Wajcman (Buckingham: Open University Press, 1999), 296.

⁶ Richard Ohmann, Selling Culture: Magazines, Markets, and Class at the Turn of the Century (London: Verso, 1996), 72–74, 100.

mainstream America. Printed advertisements provide a good source for evidence of strategies used to target potential buyers. In the absence of television and other media, US advertisements from the first decade of the twentieth century supply a particular perspective on the types of public relations battles manufacturers had to wage in selling the automobile to the public.

A significant amount of money was spent on direct consumer advertising in the early years despite the relatively small size of the automotive industry: as early as 1907, many millions of dollars were spent on marketing the roughly 40,000 cars that sold in that year for prices ranging from \$650 to \$6,000, with the average selling price at \$1,500.⁷ In the first six months of 1907 alone, the automobile industry spent \$300,000 on advertising in twelve magazines, even though, according to many contemporary estimates, the industry was incurring losses at that time, and more than 60 percent of automobile manufacturers failed in the first six years of the twentieth century.⁸

While the lack of advertising metrics for this period makes it difficult to establish causality between marketing strategy and shift in perception of the automobile, the various elements in printed advertisements certainly document the persuasive measures adopted by early automobile manufacturers. Automobile advertisements in the first decade of the century focused on convincing consumers to buy a car, not to replace an existing one. Thus, the primary task of manufacturers was to show that the automobile was a useful and necessary device. Competition revolved principally around stealing market share from the horse industry. But how did the shift from muscle to motor power gain momentum?

Pamela Walker Laird, in “The Car Without A Single Weakness: Early Automobile Advertising,” indicates that the automobile’s technical superiority

⁷ Kenneth MacKarness Goode, “Ten Years After,” *Collier’s*, November 2, 1907, 14.

⁸ *Ibid.*

dominated the marketing strategy of early advertisements. She argues that early manufacturers entered the automobile industry because of their “passion for the machines, and for the experiences of automobiling.”⁹ However, manufacturers refrained from expressing their enthusiasm in their advertising messages.¹⁰ Instead, she argues, manufacturers used a staid, “near-universal mechanical theme” in early automobile advertisements.¹¹

But apparently automakers did not feel the need to prove that automobility was exciting. All auto ads before 1920, and most before 1930, featured technical discussions appropriate to a new and expensive, exciting but intimidating technology, akin to personal computer advertisements today. Lengthy copy gave potential owners information calculated to inspire confidence in machines.¹²

Laird depicts automotive advertising until the 1920s as highly reactive, educating customers rather than anticipating and shaping their needs and tastes.¹³ Even when automotive brands were associated with prestige for legitimation purposes, manufacturers de-emphasized the excitement of owning a car.¹⁴ In this sense, Laird argues, automotive advertising, although well funded, was less professional than advertising for other brand-name consumer goods.¹⁵ Rather than hiring marketing specialists, automotive company owners and chief executive officers wrote their own advertisements well into the 1920s; thus their advertisements “reflected owners’ ambitions and concerns to a degree not true for other manufacturers then advertising

⁹ Pamela Walker Laird, “The Car Without A Single Weakness: Early Automobile Advertising,” *Technology and Culture*, 37, no. 4, October 1996, 797. She adopted the idea from Donald Finlay Davis, *Conspicuous Production: Automobiles and Elites in Detroit, 1899–1933* (Philadelphia: Temple University Press, 1988), esp. 1–3, 20–25.

¹⁰ Laird, “The Car Without A Single Weakness,” 797.

¹¹ *Ibid.*

¹² *Ibid.*

¹³ *Ibid.*, 801.

¹⁴ *Ibid.*, 797–798, again adopted from Davis, *passim*.

¹⁵ *Ibid.*, 801.

directly to consumers.”¹⁶ This study subscribes to Laird’s proposal that early automotive advertisements reflect the thinking of manufacturers.

However, Laird also argues that manufacturers *refrained* from expressing their own passions for automobiling in their advertisements—hence, their staid, mechanical message. Which personal concerns, then, were expressed in these early automotive advertisements, and which were not? Laird does not address this issue directly but simply alludes to advertisements as reflective of the personal aspirations of manufacturers. This study assumes that these aspirations involve increasing market share. The advertisements, which were lavish, reflect the manufacturers’ efforts to generate sales and thus speak of their specific assumptions on how to win over potential buyers. Early automotive advertisements were in a unique position to show customer thinking, being customer-driven as Laird proposes, while at the same time providing evidence of the persuasive measures adopted to advance profit-making interests.

However, some of Laird’s propositions prove suspect. While she argues for the pervasiveness of technical, staid advertisements, she also points to the presence of an aesthetic element coming from the carriage industry. She argues that the influence of the carriage industry in automobile advertisements also had a sedative effect.

Instead, the aesthetic roots of auto advertising are to be found in the carriage industry, the automobile’s other ancestor, and carriage advertising typically did not picture passengers or try to invoke sensations of speed or motion to appeal to consumers. The carriage trade origins of so many automakers explain the strength of this sedate legacy. [. . .] Certainly no early auto manufacturers permitted the enthusiasm they expressed about their cars elsewhere to creep into their promotions.¹⁷

Earlier, Laird characterizes these conservative advertisements as “technical discussions appropriate to a new and expensive, exciting but intimidating

¹⁶ Ibid., 801.

¹⁷ Ibid.

technology,”¹⁸ but this emphasis on technical novelty seems contradictory to the image of the “sedate legacy” of the carriage industry. Scharff, on the other hand, paints a completely different picture—manufacturers were quick, rather than reluctant, to adjust their advertising strategies, even radically changing from a Victorian mindset to a gender-free mentality once they realized that feminine features of comfort generated sales to both men and women.¹⁹

These seemingly conflicting perspectives on manufacturers, and hence, advertisements, require further verification. How did advertisements speak to the buying public at that time? How did they create a customer base? This chapter closely examines three major consumer magazines and two trade magazines from the late nineteenth century until 1910. Collier’s Once a Week, which became Collier’s: A National Weekly in 1895, was considered a pioneer for its many articles and advertisements about automobiles in the early twentieth century.²⁰ McClure’s, on the other hand, while one of the most popular New York-based ten-cent magazines, was conservative and unadventurous in its presentation of materials. Despite its traditional tone, however, McClure’s featured scientific developments in many of its articles.²¹ Hence, these two consumer magazines provide a good way to discern attitudes and perceptions across a broad spectrum.

Life magazine, which began publishing in 1883, provides a check on the claims made by consumer magazine advertisements. Life articulates mainstream thoughts and sentiments through illustrations and thus complements written sources found in McClure and Collier’s. The two trade magazines used, The Automobile and

¹⁸ *Ibid.*, 797.

¹⁹ Virginia Scharff, Taking the Wheel: Women and the Coming of the Motor Age (New York; Toronto: Collier Macmillan Canada: Free Press; Maxwell Macmillan International, 1991), 36–37, 44, 60, 87, 123.

²⁰ Mott, A History of American Magazines, 28.

²¹ Matthew Schneirov, The Dream of a New Social Order: Popular Magazines in America, 1893–1914 (New York: Columbia University Press, 1994), 78.

The Horseless Carriage, were biased in favor of the automobile, and for this reason, they provide insights into the concerns of consumers through the kinds of reassurances they reiterate in their magazines. These magazines also reported on various activities related to automobiling, particularly in the beginning of the twentieth century, and thus were included as sources. The periodical literature prior to 1910 constitutes the major source of information for the early history of the automobile;²² therefore, this study focuses on printed consumer materials to present insights into the transformative elements used to promote the diffusion of the automobile.

Creating an Anachronism: The Automobile as a Peripheral Object

“What started the demand for the automobiles, and who first attempted to fill it?”²³ asked Charles E. Duryea, the automotive pioneer who built the first American car in 1893. “Quite a natural question,” he continued, “but it is based on a misapprehension. Radical things are never demanded. Improvements are sometimes asked for, but the really great steps in advance are usually so far ahead of the public that they decry rather than ask for them.”²⁴ Speaking from experience, Duryea described how technological innovations were an uphill battle with the public. As Basalla argues, things come first, followed by the need for them, although this need may take some time to be realized, as Duryea suggested, particularly when inspiring mass consumption.

Contrary to what many historians describe as a ready market poised to replace the horse, prospective users in fact rejected the automobile outright, both as a working mechanism and as a concept. People, Duryea said, would much “prefer to drive something with life.”²⁵ Thus Duryea took pains to hide his first prototype for fear of

²² James J. Flink, America Adopts the Automobile, 1895–1910 (Cambridge, MA: MIT Press, 1970), 1.

²³ Charles E. Duryea, “As It Was in the Beginning,” The Automobile, January 7, 1909, 47.

²⁴ *Ibid.*

²⁵ *Ibid.*

being charged a lunatic. Elwood Haynes, who claimed to be the father of the automobile, used a horse to haul his first self-propelled vehicle out into the countryside for a test drive.²⁶ He thought it unsafe in 1894 to conduct trial runs in the city, as no one had seen anything quite like the vehicle. Ray Stannard Baker, the first journalist to write about the automobile for a consumer magazine,²⁷ estimated that there were fewer than thirty self-propelling vehicles in working condition at this time throughout the world.²⁸ The following year, when Haynes drove through Chicago's Michigan Avenue to the first US automobile racing event, sponsored by the Chicago Times-Herald, a policeman ordered him to leave.²⁹

In 1900, US census takers counted 57 automobile factories producing 3,723 automobiles of every kind.³⁰ The total number of automobiles in existence four years earlier had been only five to six hundred, according to the notes of a New York appraiser.³¹ Some estimated the number to be even smaller, with no more than 200 automobiles in 1898.³² The US Census Bureau in 1900 found the size of the automotive industry to be so negligible that it did not warrant a separate report.³³ Even in highly urbanized areas such as New York City, traffic laws discriminated against this newfangled machinery. An owner of a horseless carriage was arrested for driving to the entrance of Central Park.³⁴ Letters to the Atlantic Monthly, considered a highbrow magazine, described the automobile with contempt, as a clattering machine,

²⁶ Elwood Haynes, "A Few Reminiscences of the Early Automobile," The Horseless Age, December 27, 1911, 957.

²⁷ Schneirov, The Dream of a New Social Order, 184.

²⁸ Ray Stannard Baker, "The Automobile in Common Use," McClure's Magazine, July 1899, 195.

²⁹ Elwood Haynes, "A Few Reminiscences of the Early Automobile," 957.

³⁰ Kenneth MacKarness Goode, "Ten Years After," Collier's, November 2, 1907, 12.

³¹ Cleveland Moffett, "The Edge of the Future," McClure's Magazine, July 1896, 153.

³² Hermann F. Cuntz, "The Automobile as a Feeder of Civilization," The Automobile, June 10, 1909, 952.

³³ Kenneth MacKarness Goode, "Ten Years After," Collier's, November 2, 1907, 12.

³⁴ R. H. Thurston, "The Automobile or Horseless Carriage," Collier's, April 28, 1900, 9

“an anachronism and a blot,” disrupting the quiet and bucolic landscape of the countryside.³⁵ The automobile at this time still required much work to be convincing.

Pricing: The Barrier to Diffusion

Some historians, such as Flink and Berger, believe that convincing consumers meant making the automobile affordable. However, high price does not seem to have posed a significant barrier to adoption. There are indications that automobile manufacturers had in fact provided affordable automobiles from the earliest stage of the industry. If people earnestly wanted to own an automobile, it was not out of their reach.

As early as 1901, an automobile writer described that, “for those whose purse was short, there were trappy-looking voiturettes.”³⁶ About a decade later, a motorcar company’s advertisement, which ran for three years, stated that a car could either be “constructed to humor expensive tastes, or [constructed] to sell on the attractiveness of its price.”³⁷ In other words, a cheap affordable motorcar was available concurrent with expensive custom-made models.

As early as 1903, a reviewer remarked on the large selection of gasoline automobiles available for sale for anywhere from \$500 to \$9,000.³⁸ In 1905, prices of cars with different types of motors ranged from \$500 (the Pope Tribune of Pope Manufacturing Company, Hartford, CT) to \$11,000 (the Napier of Napier Motor Company of America, Boston, MA).³⁹ The price range grew even broader the following year, with prices spanning the range from \$400 (the Orient of Waltham Manufacturing Company, Waltham, MA), a hundred dollars less than the previous

³⁵ “The Contributor’s Club,” *The Atlantic Monthly*, December 1901, 863.

³⁶ Herbert L. Towle, “The Coming of the Automobile,” *Collier’s*, January 12, 1901, 33.

³⁷ Reliable Dayton Motor Car ran the same basic advertisement in *Collier’s* from 1907–1909.

³⁸ “The Selection of a Gasoline Automobile According to Price,” *The Automobile*, April 18, 1903, 422.

³⁹ “Cars Offered For the Season of 1905,” *The Automobile*, January 14, 1905, 49–63.

year, to forty times higher, at around \$12,300 (the Panhard of Panhard & Levassor Automobile Company, France, distributed in New York City).⁴⁰

Comparing car prices with the average income at that time, the automobile industry appears to have made efforts to cater to a wide range of buyers from different locations on the economic spectrum. While the US census did not begin to measure annual income until 1940,⁴¹ salary calculations derived from reports compiled from the government office of the Bureau of Economic Analysis show that the ratio of car price to average salary was not that different from current-day levels. A clerk working in the manufacturing and steam railroad industry from 1905 to 1909 earned an average of \$1,076/year.⁴² A federal employee during the same period took home about \$1,072/year.⁴³

While these employees may not have been able to pay cash for a brand new car, it was not out of their reach. If the average person was intent on owning a car at this time, he would be able to obtain, for instance, a brand new \$500 Pope-Tribune two-seater gasoline car, or even a two-seater \$650 Royal electric car, or a four-seater \$800 Prescott steam car⁴⁴ after a few years of saving or with some form of financing. A department manager selling farm implements, making around \$2,000/year,⁴⁵ would be able to afford one of many different types of cars.

Several years later, options were even less expensive. Throughout 1907 and 1908, the Success Auto-Buggy manufacturing firm frequently advertised in Collier's a “patented” four-to-forty mile-per-hour auto-buggy “suitable for city and country use,”⁴⁶ for \$250, about \$100 less than the price of a good horse outfit in 1911.⁴⁷ The

⁴⁰ “Chief Characteristics of 1906 Models,” The Automobile, January 11, 1906, 32–66.

⁴¹ Encyclopedia of the U.S. Census, ed. Margo J. Anderson (Washington, DC: CQ Press, 2000), 260.

⁴² Scott Derks, ed., The Value of a Dollar: Prices and Incomes in the United States, 1860–1999, (Lakeville, CT: Grey House, 1999), 74.

⁴³ Ibid.

⁴⁴ “Cars Offered For the Season of 1905,” 49–50.

⁴⁵ The Value of a Dollar, 73.

⁴⁶ Collier's, 1907–1908.

Black Motor Buggy manufacturing firm, also advertising in Collier's throughout 1908 and often positioning its advertisement on the front page alongside the table of contents, touted a \$375 motor buggy that obtained a gas mileage of 30 miles-per-gallon⁴⁸ on “country roads, hills and mud;”⁴⁹ their cars were affordable to run as well as to purchase.

At this time, a large number of secondhand cars were also available on the market. An observer in 1905 noted that it was comparatively easy to find a second-hand car of “almost any type at a price very much below its original cost, and in many cases at figures that are really absurdly low.”⁵⁰ Markets for secondhand models offered cars selling for as little as \$200.⁵¹ Some enthusiasts even ventured to build their own automobiles, paying just for parts.⁵² Thus the option to purchase a motor vehicle was clearly available to anyone willing to experiment with the newfangled machine. A wide range of prices was available throughout the first decade of the twentieth century for those who sought to own an automobile.

Despite the decrease in automobile prices, mass demand was not present. If it was the “inability of the [automotive] industry to produce a low cost vehicle in sufficient quantity [. . .] that prevented the rapid disappearance of the horse in American cities”⁵³ as Flink claims, low cost vehicles were available before the Ford Model T was mass produced. Duryea in fact professed to have designed and created the first US automobile for “people unable to afford horses,” something that “ate no

⁴⁷ “The Poor Man’s Automobile,” The Horseless Age, July 12, 1911, 49.

⁴⁸ Motor oil in 1908 cost approximately sixty cents per gallon. See Scott Derks, The Value of a Dollar (Millerton, NY: Grey House Publishing, 2004), 93.

⁴⁹ Collier's, 1908.

⁵⁰ “Cars New and Second-hand,” The Automobile, August 3, 1905, 147.

⁵¹ Herbert L. Towle, “The Best Car for the Novice?,” The Automobile, October 12, 1905, 395.

⁵² A. V. A. McHarg, “A Story of the Cry of ‘Get A Horse,’” The Automobile, January 16, 1908, 79.

⁵³ Flink, America Adopts the Automobile, 53. See also Flink, The Car Culture, 35, and Flink and American Council of Learned Societies, The Automobile Age (Cambridge, MA: MIT Press, 1990), 138.

oats and caused no expense when not in use,”⁵⁴ altruistic sentiments perhaps born of his experience of four years of economic depression following the Great Panic of 1893. However, despite the promise of economic relief, and safer and cleaner streets, the automobile made no practical sense to those for whom it was built.

Animating the Mechanical Beast: The Automobile on the Fringes of Society

What appeared to be an obviously far superior mechanism compared with the horse in the eyes of manufacturers and, for that matter, to historians of the automobile, was certainly not obviously superior for its targeted market at this time. For one thing, these strange mechanical beasts appeared hideous. Automobiles were described as “newfangled machinery” that to “yet unaccustomed eyes [were] extremely awkward-looking.”⁵⁵ Even the fervent automobile advocate C. E. Woods acknowledged—but understated—the problem: “The unsightly appearance of automobiles has been commented upon in this country a great deal.”⁵⁶

Horseless carriages appeared to the nineteenth century eye as carriages whose horses had been hacked off. They were ridiculed as having a “carriage-without-a-horse look” or as “shaftless bugg[ies].”⁵⁷ This mutilated appearance provided such a spectacle that the very first cars produced in the United States toured with the Barnum and Bailey Circus alongside elephants and trapeze performers (Figure 2.1).⁵⁸

⁵⁴ Charles E. Duryea, “As It Was in the Beginning,” *The Automobile*, January 7, 1909, 47.

⁵⁵ “About the World,” *Scribner’s Magazine*, March 1896, 393.

⁵⁶ C. E. Woods, *The Electric Automobile: Its Construction, Care, and Operation* (New York: H. S. Stone & Company, 1900), 31.

⁵⁷ “Survival of the Horseless Carriage,” *The Automobile*, August 21, 1906, 154.

⁵⁸ Charles Philip Fox and Jean Van Dyke, *Horses in Harness* (Greendale, WI: Reiman Associates, 1987), 8–9. Also in M. M. Musselman, *Get a Horse! The Story of the Automobile in America* (Philadelphia: J. B. Lippincott Company, 1950), 38.

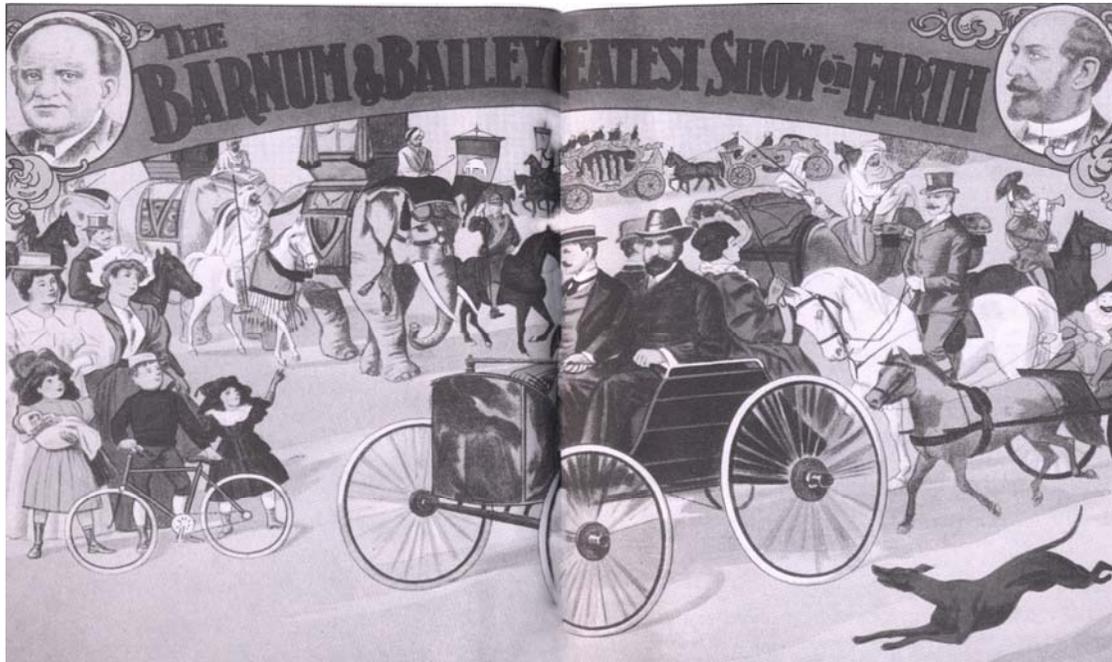


Figure 2.1. Motorcars as Circus Exhibits.

Source: Charles Philip Fox and Jean Van Dyke, Horses in Harness (Greendale, WI: Reiman Associates, 1987), 88.

The advertisement for the Haynes gasoline car claimed that its pioneer models had been “star attractions at country fairs and drew huge crowds.”⁵⁹ Horseless carriages appeared in the 1900 Paris Exposition, a venue famous for the display of creations conceived beyond the “wildest flights of imagination.”⁶⁰ The novelty of the horseless carriage was such that people saw it as a curiosity rather than as a practical, usable tool.

A writer recalled that “an automobile drawn up at a city curb was a sight to attract a gaping crowd.”⁶¹ One observer sympathetic to the cause of automobiling even admitted that “many models shown were not quite acceptable to the eye. Perhaps for a lack of previous education we are still feeling the want of a horse in front of some of

⁵⁹ Life, September 25, 1913, 533.

⁶⁰ B. D. Woodward, “The Exposition of 1900,” The North American Review, April 1900, 476.

⁶¹ Kenneth MacKarness Goode, “Ten Years After,” Collier’s, November 2, 1907, 12.

these odd-looking traps.”⁶² In an effort to make the motorcar look more familiar, an inventor in 1900 attached to the dashboard an imitation horse’s head, which he claimed could also double as a gasoline tank.⁶³ The same general idea persisted five years later in a Life magazine illustration of a motor vehicle posing as a horse and buggy.⁶⁴ Clearly, the automobile stood out as an irregular piece of machinery at this time; thus the type of attention it garnered was generally unpleasant for its owner.

The dramatic effect of the early horseless carriage was also heightened by the various sights, sounds, and smells associated with it. Horseless carriages running on steam often left a trail of vapor and, in some unfortunate circumstances, thunderous explosions from malfunctioning boilers. A competitor in the famous Paris–Marseilles–Paris race in 1896 described how his steam engine “needs a mechanic as fireman” in addition to a mechanic in charge of automotive maintenance.⁶⁵ His horseless carriage loomed so large it frightened two drivers off the road, causing them to overturn their own carts.⁶⁶ With the more modest-sized steam engine, the driver typically sat on top of his boiler, which contained about 400 pounds of pressured steam so that it was, according to one observer, “a toss up whether he was going to travel straight ahead or straight up.”⁶⁷

Petroleum motorcars, on the other hand, convulsed like beasts, threatening fire from their fuel. A Cornell University professor in 1901 assured users in all seriousness that petroleum motorcars “may be handled by the amateur with no other special danger than that of accident resulting in the firing of his tank.”⁶⁸ Even the esteemed

⁶² Henri Dumay, “The Locomotion of the Future,” Collier’s, July 30, 1898, 22.

⁶³ Musselman, Get a Horse!, 166.

⁶⁴ Life, June 19, 1905, 68.

⁶⁵ Marquis De Chasseloup-Laubat, “Recent Progress of Automobilmism in France,” The North American Review, September 1899, 411.

⁶⁶ Ibid., 406–407.

⁶⁷ George Fitch, “The Automobile,” Collier’s, September 19, 1908, 27.

⁶⁸ R. H. Thurston, “The Coming Automobile,” Collier’s, April 27, 1901, 9.

first-class Daimler, renowned for its reliability, used a tube ignition⁶⁹ in 1900 that easily caught fire, endangering both the car and its occupants.⁷⁰ Accidents and mechanical malfunctions were the norm. An 1898 cartoon depicting a horseless carriage as a dragon attacking a man⁷¹ speaks of the way early adopters struggled with their machines.

In addition to mechanical hazards, other annoyances plagued early automobiling. Motor carriages running on petroleum reeked of foul odors from the wastes of oil combustion. A 1903 Life illustration depicted a man strapped behind his car and told of his finally having the chance to “enjoy the sweet odors emitted” by his own machine.⁷² Such illustrations made fun of the extensive stench arising from automotive motors. Cars at this time also vibrated vigorously, an observer noted in 1896, from the rapid explosions in their cylinders.⁷³ Startling noises rose from carriages running on compressed air.⁷⁴ Early motor engines made so much noise that an observer noted the futility of having a horn; in fact, early models did not have one.⁷⁵

Electric cars running for more than 25 miles threatened to spill acid from their accumulators.⁷⁶ Although they tended to be less noisy, less odorous, and less jarring compared with petroleum vehicles, they were heavier because of their storage batteries, more expensive, limited in range, and impractical outside cities, where current was not readily available. Petroleum motorcars performed well at all distances and speeds, but their odors were highly unpleasant, and they were difficult to start,

⁶⁹ A tube used to generate an electric spark to ignite an air-fuel mixture that produced the motive force.
⁷⁰ Dawson Turner, “Some Experiences With Modern Motor-Cars,” The Living Age Company, June 9, 1900, 638–642.

⁷¹ “The Next Exhibition of Automobiles,” Life, August 4, 1898, 99 [adapted from the Journal Amusant].

⁷² Life, August 6, 1903, 121.

⁷³ Cleveland Moffett, “The Edge of the Future,” McClure’s Magazine, July 1896, 156.

⁷⁴ Air reduced in volume and held under pressure used to operate mechanical devices such as brakes.

⁷⁵ George Fitch, “The Automobile,” Collier’s, September 19, 1908, 27.

⁷⁶ Dawson Turner, “Some Experiences With Modern Motor-Cars,” 641.

terribly noisy, and rough in motion. Steam engines used cheaper and more readily available fuel, but they required a fireman and a mechanic to keep their boilers from exploding because of too much pressure. They also corroded easily, with sediments building up frequently.

All these unpleasant properties arose from the means necessary to animate the monstrous machines. These disconcerting sights, sounds, smells, and convulsions constituted, according to a pro-car sympathizer, the main objections against motorized carriages.⁷⁷ The notion of an animated machine designed to become part of daily life must have been immensely disturbing. Schivelbush writes of a similar experience in England in the early years of railways:

The popular images of the ‘mechanical horse’ manifest fear in the very act of seeming to bury it in a domesticating metaphor: fear of displacement of familiar nature by a fire-snorting machine with its own internal source of power.⁷⁸

Similarly, the average American citizen of this period viewed the new mechanical horse invading the streets with fearsome apprehension.

Dealing with Death Masks and Demons

That early automobile adopters appeared menacing behind the wheel did not help matters. Even the most ardent pro-car magazine called the automobile fashions of the day “hideous.”⁷⁹ This apparel, said to be in demand in many high-fashion cities such as Paris and New York, included a face mask covering the neck, with holes for the eyes fitted with goggles (Figure 2.2).

⁷⁷ “Motor Carriages,” The Living Age Company, April 10, 1897, 131–132 [adapted from The Horseless Carriages by Prof. John Trowbridge].

⁷⁸ Wolfgang Schivelbusch, The Railway Journey: The Industrialization of Time and Space in the 19th Century (Berkeley: The University of California Press, 1986), xiii.

⁷⁹ “How To Be Hideous,” The Automobile, July 11, 1903, 29.



Figure 2.2. Driver's Headgear of 1907.
Source: The Automobile, September 19, 1907, 403.

An observer commented that the most beautiful woman wearing this face mask would have resembled, in his words, “a three-ring circus or Mardi Gras fête.”⁸⁰ The gowns accompanying these masks covered the entire body, rendering the drivers unrecognizable. Automobile gowns typically were made from wool or other heavy fabric, with rubber and heavy leather styling, a popular choice at that time (Figure 2.3).⁸¹

⁸⁰ “Automobile Fashions for Women: Newest French and American,” written by “An Authority,” The Automobile and Motor Review, November 1, 1902, 12.

⁸¹ Ibid.

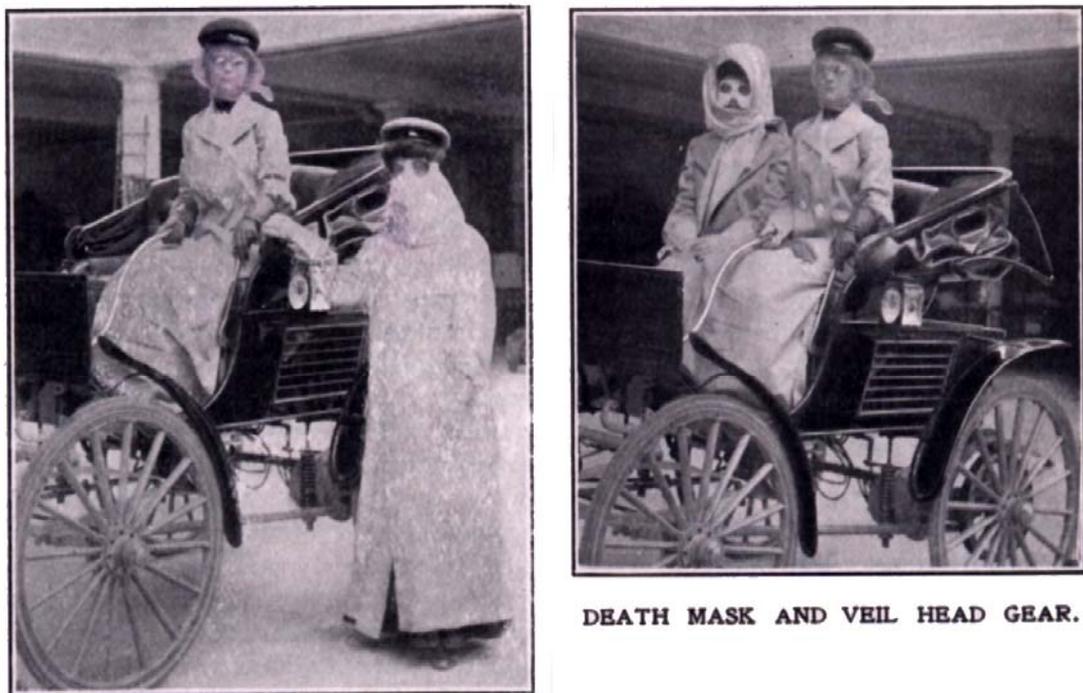


Figure 2.3. Fashionable Automobile Outfits of 1905.

Source: The Automobile, January 14, 1905, 35.

Even if a pro-car writer wanted to be complimentary, the fiendish effect of these outfits could not be overlooked. An article meant to pay homage to the racecar driver Fournier, winner of the 1901 Paris-to-Berlin race, described him as “uncanny”

in his great big black goggles, rendering his “outward appearance [that of] some new sort of demon.”⁸² The ungainly costumes meant to protect motorists from mud and dust created such an ominous effect that even the premier pro-car magazine of that time could not resist publishing a lampoon depicting a couple in their automobile outfits inducing great fright in their own child.⁸³ The headgear meant to protect the face from the elements became known as a “death mask.” And, indeed, such masks lived up to their name (Figure 2.4).



COSTUMES OFFERED IN NEW YORK

DEATH MASK AND VEIL HEAD GEAR.

Figure 2.4. Death Masks.
Source: The Automobile, July 11, 1903, 29.

The “death mask” rendered the driver unidentifiable and hence unaccountable for any fatalities caused by his or her driving. Goggles with face masks became so

⁸² Walter Wellman, “Faster than the Express-Train,” McClure’s Magazine, November 1901–April 1902, 21.

⁸³ The Automobile, August 17, 1905, n.p., [adapted from Sans-Gené].

popular that “all motorists with a love for fast driving came to look uniformly alike,” noted a writer on traffic laws and violations.⁸⁴ A 1901 Life magazine joke made the point:

Automobilist: Say, I want this mask changed. It doesn't cover my face enough.

Clerk: But it's the regular thing.

[Automobilist:] Can't help that. I find that the people I run over are apt to recognize me.⁸⁵

Another derisive but nonetheless apt illustration of this notoriety depicted a mother bidding farewell to her daughter with the usual motherly reminders, one of which was to flee the instant she happened to run over a child to avoid getting her name in the papers (Figure 2.5).⁸⁶

⁸⁴ “Decay of Speed Laws and Ordinances,” The Automobile, November 14, 1903, 499.

⁸⁵ “Imperfect,” Life, November 21, 1901, 415.

⁸⁶ *Ibid.*



Figure 2.5. Illustration, Life, November 21, 1901, 415.

Another equally suggestive joke, published the following year, made the same point. “He is the champion of our automobile club,” says a driver as a haughty looking man drives by in the opposite lane. “Yes?” the passenger urges the driver to continue. “Yes,” says the driver, “he has killed more people without getting his name in the

papers than any other member.”⁸⁷ Indeed, the bloodthirsty image of the early automobile driver came to be intimately associated with the concept of the horseless carriage itself. Many illustrations and commentaries characterized automobiling as being as diabolical as its masked drivers (Figure 2.6).



Figure 2.6. Illustration, Life, January 23, 1902, 63.

⁸⁷ Life, July 17, 1902, 49.

The gleeful face of drivers certainly emphasized amusement at the expense of public safety, and perhaps created a need for the sedate tone of automotive advertisements as described by Laird. In the interest of winning mainstream users, manufacturers perhaps wished to avoid antagonizing the public further and instead sought to recast the villainous image of the automobile. However, it did not help the cause of the automobile that many early drivers were members of the upper class and may very well have scorned the plight of the average pedestrian (Figure 2.7). Reckless rich joyriders pushed the automobile even further from mainstream sentiments (Figure 2.8).



Figure 2.7. Illustration, Life, July 3, 1902, 9.

The Latest in Automobiles.

Young gentlemen with money, who wish to amuse themselves in the most fashionable manner, are requested to examine our stock.



Rome had its gladiators, but the automobile renders the pleasure of our leisure class equally bloody, while safer and more exciting.

Figure 2.8. Illustration, Life, October 9, 1902, 303.

A 1903 Dewar's Scotch advertisement best captured heedless automobiling in its early days with its promise that "there is no more exhilarating sport or recreation than automobiling. The pleasure of a spin over country roads or through a city park is

greatly enhanced if the basket is well stocked with Dewar's Scotch"⁸⁸—again, imagery in sharp contrast to the staid mechanical theme of automobile advertisements described by Laird. Automotive manufacturers evidently did not need to portray the excitement of automobiling; other businesses accomplished that for them (Figure 2.9).



AUTOMOBILING

There is no more exhilarating sport or recreation than automobiling. The pleasure of a spin over country roads or through city park is greatly enhanced if the basket is well stocked with

**Dewar's
Scotch**

"White Label"

the popular brand both in this and the old country. "There is no Scotch like Dewar's," is a proverb among connoisseurs.

AN AUTOMOBILE POSTER

"Automobiling" (copyright 1903, by Frederick Glassup) is an original drawing by E. N. Blue, shown herewith. Printed in four colors on heavy plate paper, without advertisement, and sent to any address on receipt of 10 cents in silver. Suitable for framing in clubhouse or home. Next month, a delightful camp scene by the famous artist, Ray Brown.

FREDERICK GLASSUP
Sole Agent for John Dewar & Sons, Ltd.
126 Bleecker Street, New York

Figure 2.9. Dewar's Advertisement, Life, July 9, 1903, 34 (inside front cover). Also in Life, July 23, 1903, 94.

⁸⁸ Life, July 9, 1903.

The emphasis on the exhilaration of drinking and driving was indicative of the reckless spirit of early adopters who used the automobile for amusement. Some examples of the great disconnect between the automobile and the public were captured in the many illustrations of the rich amusing themselves at the expense of common folk (Figures 2.10 and 2.11).



Figure 2.10. Illustration, Life, November 20, 1902, 439.

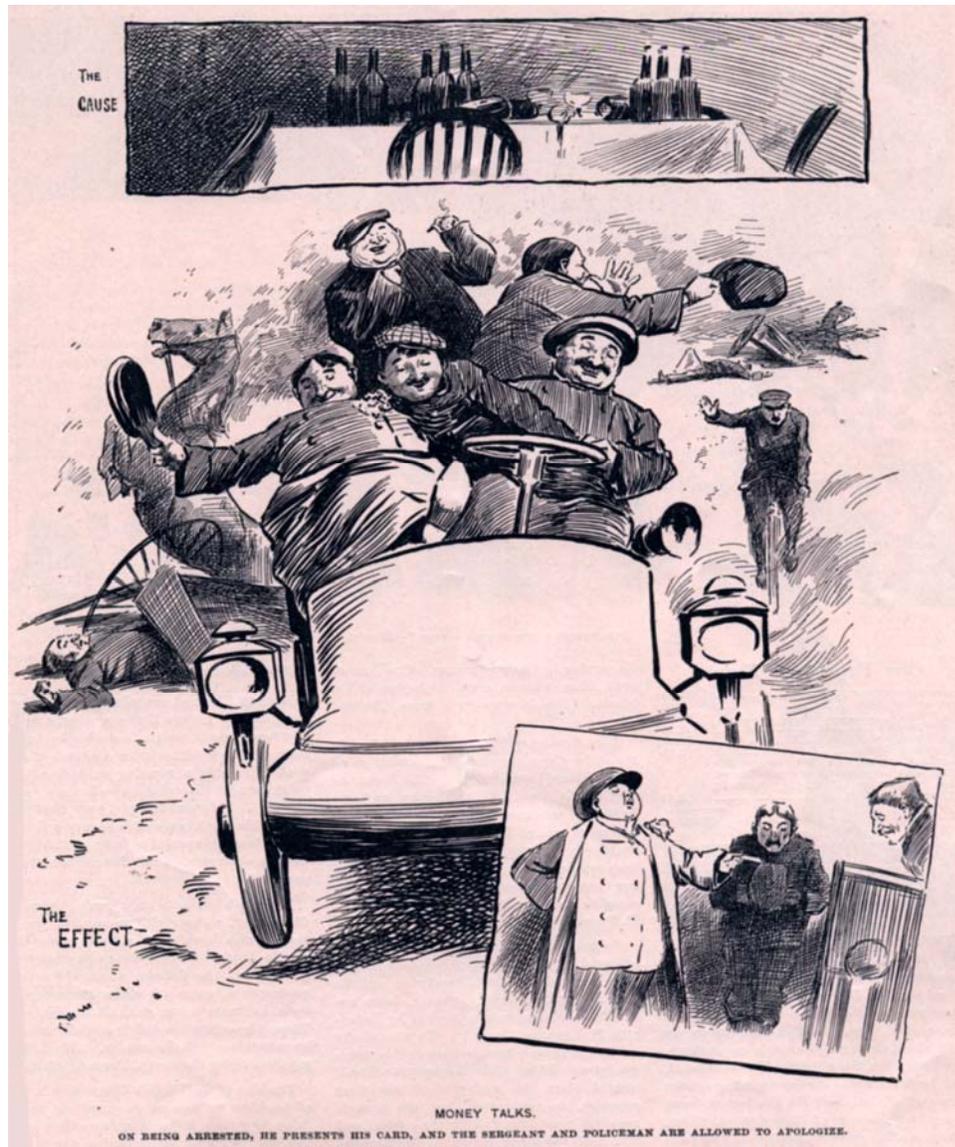


Figure 2.11. Illustration, Life, October 2, 1902, 279.

Titles of illustrations lampooning the rich included “Joy-riders drive on after running down boy.” Cartoons in Life magazine suggested physically isolating automobiles within the close confines of a horse race arena, dubbed “Speedway for Millionaires Only.”⁸⁹ The sense of entitlement of the rich and their wanton disregard for the welfare of average citizens inspired anger and public outrage. Automobiles

⁸⁹ Life, July 30, 1903, 103.

became associated with debauchery and delinquency. Hatred for the automobile reached such fervor that it became politically astute to condemn the vehicle. For instance, in New York City, policemen reportedly arrested automobilists indiscriminately in order to please the “higher up” who, for purposes of good politics, wanted to please the majority of voters who had been “down on” the automobile.⁹⁰ Thus despite the promise of cleaner streets and other public health benefits, government officials were adamantly against the automobile and used government resources to curb its use.

The Slaughterer Absconds

The media were equally unsympathetic. Social commentaries in the forms of illustration, satire, and poetry evoked images of the automobile as a “slaughterer,” tossing common pedestrians, including children, into the air (Figures 2.12 through 2.14).



Figure 2.12. Illustration, Life, December 4, 1902, 490.

⁹⁰ “Automobilist Sues Policeman,” The Automobile, July 4, 1903, 20.

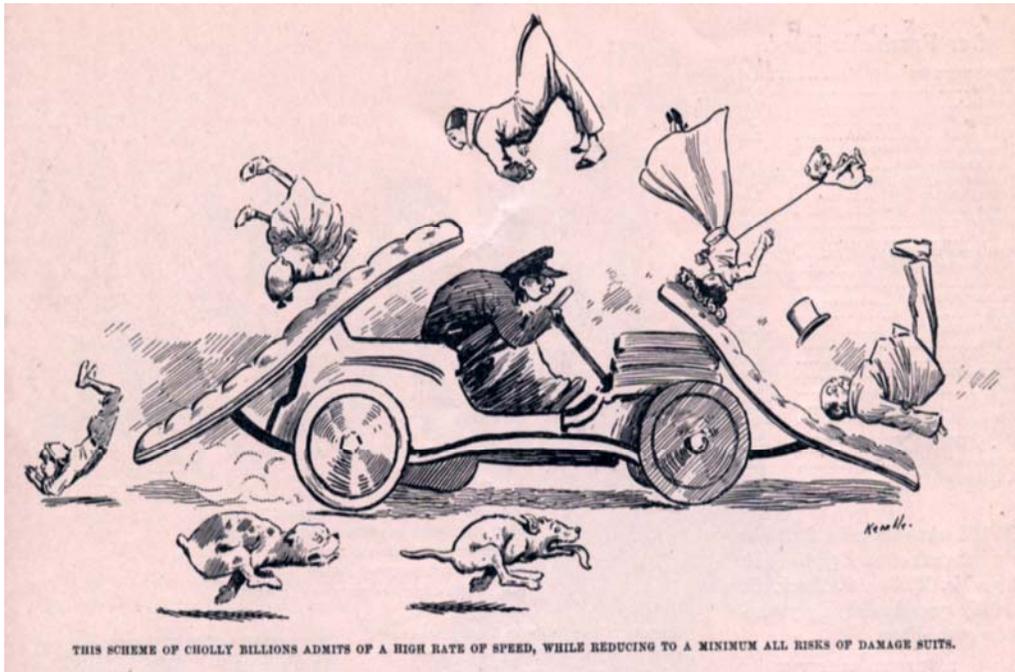


Figure 2.13. Illustration, Life, August 21, 1902, 151.

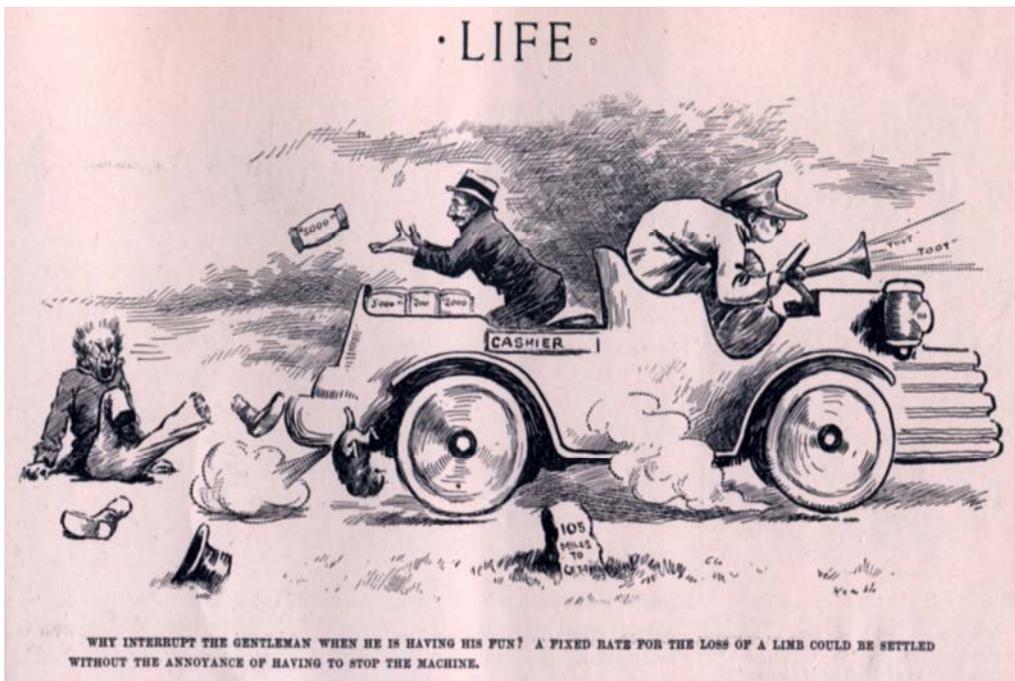


Figure 2.14. Illustration, Life, December 19, 1901, 533.

Parodies of poems such as Edgar Allen Poe's "Valley of the Unrest" and Tennyson's "Charge of the Light Brigade" depicted trails of death and damage left by the automobile.⁹¹ Vanderbilt's personal automobile was named the "White Ghost."⁹² In his review of the famous Vanderbilt Cup race of 1908, a journalist began with a satirical note of astonishment that only one child was bruised and broken. He was expecting hundreds.⁹³

Cars posed hazards even for their drivers. An observer pointed out that "there was not a second while the race was on that any driver of any of the eighteen cars might not for a dozen different causes have been hurled into eternity."⁹⁴ In one of the earliest studies of automobile accidents, survey results showed that 202 people were injured or killed in 96 accidents during the three summer months of 1907 alone—a number that even a pro-car sympathizer deemed "really astonishingly small" given the amount of traffic at that time.⁹⁵ Before this formal study on automotive accidents, social commentaries had already alerted the public to what was happening in the streets.

A score of automobilists, many of them prominent businessmen and socialites, became fugitives from the police.⁹⁶ These costumed drivers came to be associated with outlaws, as aptly illustrated in a 1903 comic strip (Figure 2.15).

⁹¹ *Life*, May 12, 1904, 459.

⁹² Walter Camp, "The Automobile," *Collier's*, March 9, 1901, 21.

⁹³ Julian Street, "The Fools at the Finish," *Collier's*, November 7, 1908, 16.

⁹⁴ Charles Belmont Davis, "The First Man Back," *Collier's*, November 7, 1908, 23.

⁹⁵ Kenneth MacKarness Goode, "Ten Years After," *Collier's*, November 2, 1907, 14.

⁹⁶ "Decay of Speed Laws and Ordinances," *The Automobile*, November 14, 1903, 499.



Figure 2.15. Illustration, Life, July 30, 1903, 113.

The public, indignant about reckless driving, condemned the automobile as a killing machine. One notorious case was that of Frank Hodge, who in 1905 ran down a man in Pittsburgh in a manner witnesses described as “bold and cold blooded.”⁹⁷ Hodge fled on the night of the accident back to Buffalo, where his family resided. After the Pittsburgh police tracked him down on charges of felonious assault and battery, he surrendered himself to the Buffalo police but was immediately released on a mere \$1,000 bail after some maneuvering by his prominent family. The Pittsburgh public became so enraged over what had been a long series of cold-blooded automobile

⁹⁷ “All Pittsburgh Aroused,” The Automobile, August 10, 1905, 174.

killings in their city that steps were taken to extradite the young man to Pittsburgh for trial.

Even the famous race car driver Fournier was arrested for fast driving in New York City while demonstrating a car to a prospective buyer.⁹⁸ On the same night as Fournier's arrest, a chauffeur was arrested after being chased around New York City, where he allegedly intentionally knocked down a policeman on a bicycle.⁹⁹ The chauffeur was charged with felonious assault and fast driving, with bail set at \$2,000. When his employer went to the courthouse to bail him out, he learned of his chauffeur's behavior and left in disgust without making the necessary deposit. Chauffeurs constituted a group of users that shared reckless driving behavior with the rich but had opportunistic motivations as well. They sought to rise above their subservient position through their mastery of automotive machinery, making the car an ever greater symbol of disruption.

Recalcitrant Chauffeurs

Kevin Borg describes the problems wealthy employers faced as a result of their dependence on recalcitrant chauffeurs.

Chauffeurs became a serious problem for wealthy motorists during the first decade of the twentieth century. They extorted commissions and kickbacks from garage owners, took their employers' cars out for joyrides at all hours, and exhibited a brazen disregard for social decorum. They did not behave as servants.¹⁰⁰

Chauffeurs were hired to drive and maintain large gasoline and steam-powered cars on the assumption that they would behave in the manner of coachmen. Borg describes the attempt to transfer social practices from horses to horseless carriages.

⁹⁸ "Reckless Chauffeurs Arrested," The Automobile, January 21, 1905, 158.

⁹⁹ Ibid.

¹⁰⁰ Kevin Borg, "The 'Chauffeur Problem' in the Early Auto Era: Structuration Theory and the Users of Technology," Technology and Culture 40, no. 4 (1999): 797.

This is exactly what many wealthy motorists did when they purchased an automobile: they hired chauffeurs, dressed them in livery, and gave them responsibility for the care and maintenance of their vehicles, transposing the rules associated with horse transportation to their new horseless carriages.¹⁰¹

However, the mechanical problems early motorcars presented, Borg argues, made wealthy motorists dependent on their chauffeurs.¹⁰² The scarcity of qualified chauffeurs and the specialized knowledge required to maintain a motorcar provided the means for chauffeurs to disrupt the master-servant hierarchy. A chauffeur's wage in 1906, anywhere from \$75 to \$150 per month,¹⁰³ would have easily paid for a \$250 Success auto-buggy in two months' time. Although well compensated, chauffeurs preferred to drive the larger and more powerful cars of their employers without obtaining consent.

According to a Life magazine editorial, "the chauffeur owns the highway. Out of danger himself, drunk with speed, absolutely irresponsible, and always fleeter than his outraged victims, he devastates the country, and in perfect safety."¹⁰⁴ An attorney for a large city garage observed that many chauffeurs who were discharged for drunkenness, theft or reckless driving were re-hired repeatedly because employers did not bother to conduct background checks.¹⁰⁵

One of the ways wealthy motorists controlled the chauffeur problem was through legislation. Wealthy Pennsylvania employers, for instance, were freed from any responsibility for damages done by their autos if they assisted in the prosecution of their joyriding chauffeurs.¹⁰⁶ Many states began imposing age requirements (18 years old), and the testing and licensing of all chauffeurs.¹⁰⁷ Wealthy motorists also

¹⁰¹ Ibid., 802.

¹⁰² Ibid., 806.

¹⁰³ Frank Munsey, "The Automobile In America," The Automobile, February 1, 1906, 313.

¹⁰⁴ "Why Not Here?," Life, August 17, 1905, 205.

¹⁰⁵ De Witt C. Morrell, "Reckless Employers," The Horseless Age, December 8, 1909, 652.

¹⁰⁶ Kevin Borg, "The 'Chauffeur Problem' in the Early Auto Era," 814–815.

¹⁰⁷ Ibid., 816.

addressed their dependence on their chauffeurs' technical skills by opening YMCA training schools that generated alternative sources of skilled labor.¹⁰⁸ Garage owners began dealing with car owners directly, instituting stricter accounting procedures, and closely monitoring activities in their garages.¹⁰⁹

Thus wealthy car owners, although seeking to promote the use of automobiles, did not share the interests and values of other users such as the reckless rich and recalcitrant chauffeurs. Judges who favored automobiles sentenced chauffeurs to five days in jail and a \$50 fine for speeding violations.¹¹⁰ In one famous 1905 case, a judge professing to be an ardent automobilist himself sentenced a chauffeur to eighteen months in prison (the full penalty of the law was two years in jail) plus a \$100 fine for accidentally running over a little boy.¹¹¹ Despite a recommendation of mercy by the jury and hopes of an acquittal, the severity of the punishment, according to the judge, served to warn and admonish automobile drivers.¹¹²

In another case four years later, a police judge in the Indianapolis city court penalized a chauffeur with 60 days in prison and a \$1 fine for driving while intoxicated; another \$1 for profanity; \$200 for malicious trespass for operating an automobile without permission and an additional sixty days in prison; an additional \$200 plus another sixty days in prison (180 days cumulative total) for malicious trespass for the damage done to the cab; and a \$50 fine for violating speed laws.¹¹³ Although some judges owned cars themselves, they wished to send a clear message to reckless drivers. Chauffeurs were to be severely punished for reckless driving, with the aid of the very same owners who favored fast cars.

¹⁰⁸ Ibid., 817–818.

¹⁰⁹ Ibid., 819–820.

¹¹⁰ “Jail Sentences For Speeders,” *The Automobile*, June 8, 1905, 707.

¹¹¹ “Eighteen Months in Prison,” *The Automobile*, August 17, 1905, 199.

¹¹² Ibid.

¹¹³ “Severe Punishment to Break Up Joy Riding,” *The Horseless Age*, December 8, 1909, 674.

Ambiguity among Automobile Advocates

Many early users of automobiles attained such notoriety that mainstream society became alienated from automobiling. A physician established an insane asylum with one ward set apart for deranged motorists and chauffeurs.¹¹⁴ The two social groups publicly associated with the automobile, the reckless rich who amused themselves at the expense of the average citizen, and the recalcitrant chauffeurs who followed suit at the expense of their wealthy employers, shared the meaning of the automobile as a source of pleasure but ultimately were motivated differently. The rich used the automobile for simple diversionary purposes, whereas chauffeurs used it as means of escape from their subservient role.

The Automobile magazine, known for its pro-motorcar bias, sought to shift the blame directly to the operator of the automobile rather than to the automobile itself. Reckless drivers were previously horsemen: “Practically all those who now own machines were horse owners before, and if they are discourteous now, they were when they drove a horse.”¹¹⁵ Thus, the implicit message was to associate reckless driving with horse riders.

The owner of the Herald, who sponsored the first car race in the United States in 1895, published statistics characterizing horses as unreliable and dangerous. The study showed that horses were the leading cause of fatalities and accidents (40%) compared with the meager 5% caused by automobiles.¹¹⁶ The study, however, did not indicate the percentage of automobiles in active use that had been involved in an accident; the number of automobiles was a fraction of the millions of horses used at this time.

¹¹⁴ “In Touch with Market,” The Automobile, October 5, 1905, 370.

¹¹⁵ “Man, Horse, Automobile, and the Highways,” The Automobile, January 9, 1908, 39.

¹¹⁶ “Dangerous Animals on the Streets,” The Automobile, February 22, 1906, 434.

Nonetheless, the pro-car article went on to describe the horse as aggressive and dangerous, as well as cowardly and stupid, for it would “take fright at a fluttering bit of paper or some equally harmless thing and run away.”¹¹⁷ This attack on the horse came as an offensive move to address the widely held belief that automobiles were monstrous killing machines. Thus an aggressive social group sought to defend the automobile at all costs by shifting the blame to horses.

The great divide between horses and automobiles had been underway since the advent of the horseless carriage in the late nineteenth century: if one favored the automobile, then one must be against the horse. Although SCOT recommends organizing social groups based on specific changes made to an artifact, this chapter focuses on the concept of the automobile itself—the notion of a self-propelled horseless vehicle—rather than specific changes made to a particular type of automobile. What was at stake in this early period was the choice between muscle and motor power. Thus, this large-scale technological change involved the struggle of moving the automobile from the periphery to mainstream, everyday society.

Unthinking Machines

Horses had been perceived as a “friend of man” in work and leisure.¹¹⁸ Automobiles, on the other hand, frightened horses and pedestrians; many people were maimed and killed because of reckless driving and malfunctioning motors. Thus, traffic laws were written to protect horses from motors. Massachusetts automobile law in 1902, for instance, required automobile drivers to stop at the behest of drivers of horses if the latter found their animals frightened.¹¹⁹ New York, Massachusetts, Michigan, and other states required automotive speed within city limits to be no more

¹¹⁷ Ibid.

¹¹⁸ “Dangerous Animals on the Streets,” *The Automobile*, February 22, 1906, 434.

¹¹⁹ “Massachusetts Automobile Law,” *The Automobile and Motor Review*, June 14, 1902, 20.

than ten miles per hour in order to control what were perceived as unruly interlopers in public roads.¹²⁰

Articles and illustrations in those early days depicted automobiles as highly unreliable, dangerous, and menacing to society—in essence, unlike the horse. As early as 1896, a writer argued that people who used horseless carriages must be oblivious in general disposition for their inability to distinguish horses from machines.

Automobiles were purported to be dangerous because they were unthinking, *unlike* horses; people failing to detect the lack of intelligence in motorcars were depicted as being as unthinking as machines.

To tell the truth, all mankind may, with great clearness, be divided into two parts—those who understand horses and those who do not. These are people who will drive or ride a nag all day, nay, who may own one and use it for years, whose powers of observation are not sufficiently enlisted in the details of the animal to distinguish it from any strange horse in the next stall, unless there be some gross difference in color. Such equestrians will be content to see a fine horse, with nerves, eyes, muscles, and possibilities for good or evil, cashiered in favor of the dead certainty of a peripatetic steam-engine.¹²¹

This pro-horse advocate maintained that a failure to notice the most obvious details in life, such as the exquisite qualities found in a fine horse, must explain the desire to purchase a motorcar. Early adopters of automobiles were depicted as ignoramuses, who by sheer lack of observation failed to distinguish between intelligent muscle power and unthinking motor power.

Nevertheless, all was not lost for those who had fallen for the automobile, claimed the pro-horse advocate. These machines could serve an honorable purpose—to perform tasks too senselessly arduous for the intelligent horse:

¹²⁰ “New Street Traffic Ordinance for New York,” *The Automobile*, January 31, 1903, 154. Also, “Massachusetts Automobile Law Signed by Governor Bates,” *The Automobile*, July 4, 1903, 21; and “Two Auto Bills Pending in Michigan,” *The Automobile*, January 21, 1905, 160.

¹²¹ “About the World,” *Scribner’s Magazine*, March 1896, 393–394.

But is it not absurd to defend a good horse from a horseless carriage? Each will have its appointed duties, and no one will be so glad as the man that makes a friend of his nag that a nerveless substitute has been found for the straining, scrambling, jaded creatures which afford such heart-breaking scenes on the icy cobble-stones of the city.¹²²

This pro-horse advocate sought to confine mechanical work to tasks beyond the traditional work of horses in order to limit the increasing transgressions visited upon the noble steed. Advocates for the horse believed that replacing muscle power would negate the inherent intelligence found in work routines performed by horses. A historian in 1897 proclaimed, “The substitution of inanimate power for the animal power on which our race was formerly dependent means a separation of the force which does the work from the intellect which directs it,”¹²³ an argument that resembles the general criticism of automating human labor at that time.

Mechanical power lacked both will and the capacity to assist man. People wanted to drive something with life, as Duryea himself observed.¹²⁴ Thus the lack of intelligence in this newfangled machine meant that more effort would have to be exerted by the driver. An observer stated, “The man who drives a horse has little to do; the horse finds the way and does the work, but the driver of a motor carriage has a senseless machine, and all direction must come from him.”¹²⁵

Although some technological analysts, such as Latour, view mechanization as an improvement,¹²⁶ some people in the nineteenth century disagreed. The arrival of motor machines required humans to be even more alert and skilled, for they could no

¹²² Ibid.

¹²³ George Morrison, “The New Epoch and the Currency,” The North American Review, February 1897, 146.

¹²⁴ Charles E. Duryea, “As It Was in the Beginning,” The Automobile, January 7, 1909, 47.

¹²⁵ Ibid.

¹²⁶ Latour, in his essay on door closers, states, “When humans are displaced and deskilled, nonhumans have to be upgraded and reskilled.” The lack of discipline and reliability among humans, specifically porters, has to be compensated for, or put into order using nonhuman instruments, such as the hinge-pin or the door-closer. See Bruno Latour (writing as Jim Johnson), “Mixing Humans and Nonhumans Together: The Sociology of a Door-Closer,” Social Problems 35 (1988), 301.

longer rely upon the horse to compensate for their lack of concentration. Indeed, studies on intelligent machines, as discussed in the literature review section, suggest the tremendous complexity and near impossibility of replacing the human mind, and the same might be said about the horse.

Unless a task itself was significantly simplified and performed in a highly controlled and ultimately impractical environment, machines could not reliably and comprehensively replace a sentient worker—even an equine one. The experience of replacing the horse in this case ultimately meant losing some of the functional features that drivers had come to take for granted in the horse, such as its abilities to find its way home and to avoid accidents without the need for constant direction from the driver.

Racing commentaries at the first US car race in 1895 agreed that horseless carriages would be more prone to accidents because they did not possess the easy steering control of experienced horses. A reporter of the race articulated their line of thought:

It should be borne in mind that the carriage without a horse is also without the convenience of a horse's intelligence, which really in ordinary traffic and driving relieves the person holding the reins of a large part of his responsibility. For not even the best made motor can think, and the slightest carelessness on the part of its driver, or failure of the guiding apparatus, might precipitate an accident.¹²⁷

The driver of a motorized car would be alone, without aid; there was no horse to compensate for the driver's shortcomings. Accidents then became associated with machines, which by virtue of their insensibility were unable to protect drivers from their own mistakes. This pro-horse group was fighting to protect the horse from obsolescence by showing its superiority over machines.

¹²⁷ Cleveland Moffett, "The Edge of the Future," McClure's Magazine, July 1896, 154.

Thus the predominant dynamics of the initial deployment of the automobile concerned the credibility of the automobile itself, both as a concept and as a device, and its ability to deliver benefits that the horse had not been able to provide or had failed to provide. The predominant question in people's minds was "Why do we need the automobile when we have the horse?" Moving the automobile from peripheral to mainstream status meant discounting the horse. C. E. Woods,¹²⁸ an avid machinist and most likely the same C. E. Woods mentioned in the cover story of McClure's Magazine and described as one of the leading automobile manufacturers in 1899,¹²⁹ insisted that the work of the horse had to be directly replaced by a contrivance able to perform the same tasks.

When we review all that has been done by mechanical devices toward the displacement of animal power, it is very hard to refrain from drawing a conclusion that the horse must go; that is, speaking in the broad sense of the word. Mechanically propelled vehicles for all purposes are here.¹³⁰

The struggle for ubiquity became a struggle between the pro-car group and the pro-horse group.

Invading the Horse Industry

The annual production of horse-drawn carriages had been substantial. In 1900, 907,482 family-use carriages alone were produced, worth a total of \$51.5 million.¹³¹ Added to this number were 575,351 business wagons, with another 2,316 for public transportation, together amounting to roughly \$32.6 million,¹³² giving a total of 1.5 million horse-drawn carriages of all types, valued at \$84 million.

¹²⁸ C. E. Woods would perhaps be described by Law as a "heterogeneous engineer" who marshaled physical as well as social resources to help build an automotive industry. See J. Law, "Technology and Heterogeneous Engineering: The Case of the Portuguese Expansion," in The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology, ed. W. E. Bijker, T. P. Hughes, and T. J. Pinch, 111–134 (Cambridge: MIT Press, 1987).

¹²⁹ Ray Stannard Baker, "The Automobile in Common Use," McClure's Magazine, July 1899, 200.

¹³⁰ C. E. Woods, The Electric Automobile, 3.

¹³¹ "Pleasure vs. Commercial Cars," The Automobile, April 12, 1906, 651.

¹³² *Ibid.*

Horses at this time fueled much of the rural and urban economy. United States Department of Agriculture statistics place the number of horses at roughly 14.2 million in 1890, and over 17 million in 1905, with their selling price almost doubling, from \$37.50 per horse in 1899 to \$70.34 in 1905, during the supposed period of the “passing of the horse.”¹³³ When the automobile began to be introduced to the public streets, there was a simultaneous increase in the demand for horses. According to McShane and Tarr,

Between 1870 and 1900, as society became more dependent on the horse, the amount of capital invested and the number of workers employed in industries such as carriage-making and repair, saddlery and harnesses, and whip manufacture vastly increased.¹³⁴

It is possible that the burgeoning horse industry whetted the appetite of automobile manufacturers, who sought to tap into this lucrative market. The autumn horse show of 1896 has been described to have increased in importance, one year after the first automobile race in the United States.¹³⁵ Even as late as 1908, the demand for horses steadily increased, with numbers reaching close to 20 million.¹³⁶ With an eye toward this lucrative market, automobile manufacturers did not intend for automobiles to perform types of work different from those performed by horses; they wanted to plunder the lucrative horse industry. A writer articulated this desire:

Naturally there will always remain a limited number of users who, by preference or supposed economy, will remain true to the horse and buggy, but the total given [937,000 family and pleasure carriages], which represents a value of \$55,000,000, shows that *there is still a tremendous field which the automobile builder may invade and reasonably hope to capture by quicker,*

¹³³ “Futile Deductions from Horse Statistics,” The Automobile, March 29, 1906, 580.

¹³⁴ Clay McShane and Joel A. Tarr, “The Centrality of the Horse in the Nineteenth-Century American City,” in The Making of Urban America, ed. Raymond A. Mohl, (Wilmington, DE: Scholarly Resources Inc., 1997), 119.

¹³⁵ “About the World,” Scribner’s Magazine, March 1896, 393.

¹³⁶ “Farm Horse Giving Way To Its Rival, The Auto,” The Automobile, February 20, 1908, 246.

cheaper and more economical methods of mechanical transport (emphasis mine).¹³⁷

Stealing market share from the horse was not the only motivating factor. Manufacturers wanted the automobile to be perceived as a necessity, rather than a plaything, to ensure its perpetual use. A letter to the editor of The Automobile astutely articulated the thoughts of many manufacturers. “When the faddist has worked out his pleasure car, he may or may not replace it; when the motorcar is used in business, it *must* be replaced by another.”¹³⁸ Automobile manufacturers had much work to do to change mainstream perception of their infamous product.

Moving from the Periphery to the Center of Society

An automobile advocate who published a manual on the construction, care, and operation of the electric automobile in 1900 asked the same question Duryea had asked earlier:

What conditions exist that will make a market for automobiles or create a desire in the public mind for their use? Some will say progression, the spirit of which surrounds us everywhere; others say, expediency and the desire for saving minutes and even seconds; others, again, their convenience and readiness for instant use; all of which are true but do not in a broad sense answer the question, but create another as to what has made all these things desirable on the part of the public as things necessary to its comfort and welfare.¹³⁹

Comfort superseding other, more exciting features such as “expediency” and “readiness for instant use” would require the automobile, considered a fad rather than a necessity, to shed its whimsical image in order to become a staid, reliable form of transport. One way to accomplish this transformation was to associate the devil wagon with the most accepted form of motive power—the horse. Thus at this early stage, the

¹³⁷ “Horse-Drawn Statistics That Indicate Auto’s Growth,” The Automobile, February 6, 1908, 189.

¹³⁸ F. R. Hutton, “Technical Experience,” Letter to the Editor, The Automobile, January 14, 1905, 42.

¹³⁹ C. E. Woods, The Electric Automobile, 1.

automobile had to emphasize its similarity to the horse rather than its novelty. At the same time, the automobile also sought to displace the horse by highlighting its biological limitations.

Motorized power posing as muscle power came as a move to pull the automobile from the periphery to the very center of society—automobile manufacturers employed various means to project the image of a reliable, easy-to-operate, mundane, practical machine rather than that of a foul mechanical monstrosity that compromised public safety. As early as 1900, manufacturers such as C. E. Woods were already articulating their desire to see automobiles provide services identical to those of horse-drawn carriages without any sacrifice in ride quality:

There is a mistaken idea with many people, who have not given the subject any thought, that automobiles are sold for their novelty and because they go without a horse. But this is wrong. The purchasing public which uses automobiles buys them primarily for the same purpose for which it has always purchased any class of vehicle, namely, because a carriage or a vehicle is needed for personal transportation, convenience and comfort; and as it is among the better class of carriage users that automobiles are generally sold, they demand the same diversity of design, the same elegance in finish, the same magnificence in appointment, and the same easy riding qualities that they have always been accustomed to when drawn by horses.¹⁴⁰

The pleasure of comfortable riding and the practical necessity of mobility embodied what manufacturers sought to display in their automobiles. In early automobile construction, rider comfort received minimum consideration until carriage mechanics and builders stepped in to help popularize the automobile by creating larger and roomier seats, adjusting automotive springs for even weight distribution, and installing side doors for easy access.¹⁴¹

¹⁴⁰ C. E. Woods, The Electric Automobile, 29.

¹⁴¹ J. M. Davis, "A Carriage Trade Viewpoint," Letter to the Editor, The Automobile, May 18, 1905, 623.

A letter to the editor of The Automobile observed that the move to hire carriage mechanics came from the need to decrease the weight of automotive parts in order to make them look less like heavy machinery and to allow them to have “a pleasing effect to the eye” through adjustments to the dimensions of the body for symmetry.¹⁴² At the 1905 Carriage Builder’s National Association convention, the president, in his opening day speech, admitted that “the carriage maker has already been called upon by the engine builder to equip his machinery with durable and luxurious bodies and upholstery, and those who have taken up this new branch of industry report that it is constantly increasing.”¹⁴³ Thus the automobile had to undergo a radical shift from the noisy, the dangerous, and the curious to the respectable, the classy, and the sensible personal transport of the everyday.

One could argue that this transformation involved making the horseless carriage “invisible,”¹⁴⁴ and hence, in Silverstone’s terminology, “domesticated,” by transforming a radically new device into something ordinary, taken-for-granted, and part of the everyday worldview. One of the ways this invisibility was accomplished was through the horseless carriage’s assumption of the form of the horse-drawn carriage. Traditional names and designs from the carriage industry were copied by the rising automobile industry. The phaeton, a well known horse-drawn carriage with four seats, designed for open air with a portable half-top or without a top, was copied by many automobile manufacturers in their standard models.¹⁴⁵ Other examples include runabout automobiles, which came from runabout horse-drawn carriages. Coach, a generic term used to describe a closed vehicle that could seat four or more people,¹⁴⁶

¹⁴² Ibid.

¹⁴³ “Carriage Builders Consider Autos,” The Automobile, October 12, 1905, 413.

¹⁴⁴ Roger Silverstone, Television and Everyday Life (London: Routledge, 1994), 98.

¹⁴⁵ Stanley M. Jepsen, The Coach Horse: Servant with Style (New Jersey: A.S. Barnes and Co., Inc., 1977), 26.

¹⁴⁶ Charles Philip Fox, Horses in Harness, 118.

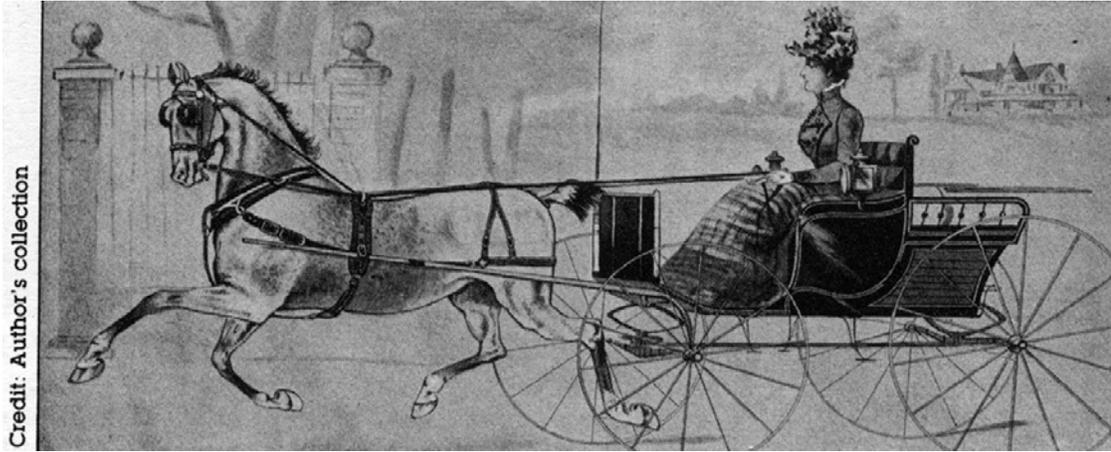
particularly dominated the later versions of the automobile as it sought to emphasize comfort and privacy.

The effort to duplicate horse-drawn carriages in almost all respects speaks of the dependence of the nascent automotive technology on the object it sought to displace. A 1905 manual for the construction of practical and workable light motor carriages recommended using the body frames from horse-drawn carriages.¹⁴⁷ The Automobile magazine, a staunch proponent of motorized vehicles, admitted in 1906 that “without endeavoring to improve on the fundamental principles of carriage construction,” horseless carriages could be built by merely “applying mechanical power for propulsion” to horse-drawn carriages.¹⁴⁸ The Automobile magazine describes the survival of horseless carriages as a matter of mimicking rather than differentiating themselves from their competitors. Car designs were translated into an equine idiom: the bodies of early motorcars were purposely constructed to resemble horse-drawn carriages¹⁴⁹ (Figures 2.16–2.21).

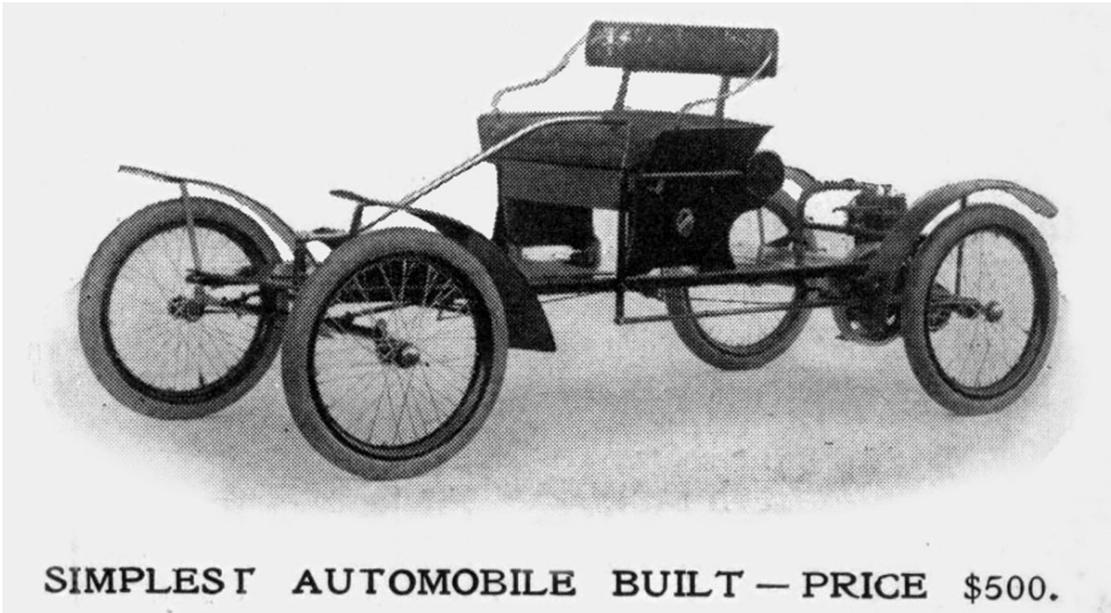
¹⁴⁷ James E. Homans, Self-Propelled Vehicles: A Practical Treatise on the Theory, Construction, Operation, Care, and Management of All Forms of Automobiles (New York: Theo. Audel & Company, 1905), 62.

¹⁴⁸ “Survival of the Horseless Carriage,” The Automobile, August 21, 1906, 154.

¹⁴⁹ *Ibid.*



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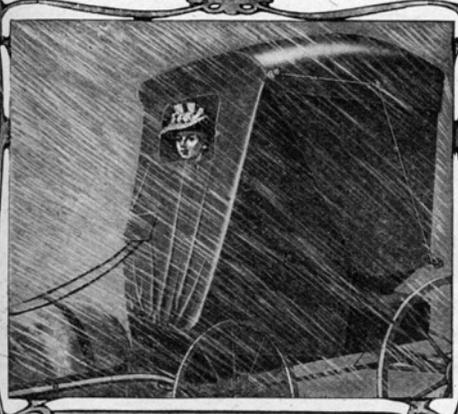


B

Figure 2.16. Simplest Carriages.

(A) Source: Charles Philip Fox and Jean Van Dyke, Horses in Harness (Greendale, WI: Reiman Associates, 1987), 122.

(B) Source: The Automobile, April 18, 1903, 422.



Not a drop can touch you when your buggy is closed up by the

Blizzard Storm Front
(Patented in United States and Canada)
Fits Any Buggy

Adjusted in 30 seconds without getting out or removing gloves, sides open and close as quickly and easily as a door, large line pocket, guaranteed satisfactory. The large window, 12 x 20 inches, is a pliable transparent material that won't break. Rubber Cloth, \$3.50; Heavy Rubber Cloth, \$4.00.

Ask your dealer and be sure that trade-mark "Blizzard" is stamped on inside under window. Sold by Vehicle, Harness and Hardware dealers. If yours hasn't it, write us. *Illustrated booklet free.*

VEHICLE APRON & HOOD CO., 210 E. Rich St., Columbus, Ohio

A

The Holsman Automobile

FIVE YEARS OF SUCCESS

Rides Like a Carriage



A STANDARD type of power vehicle, light, strong, handsome, high-wheeled, high-bodied—simple, and splendidly efficient. "Rides Like a Carriage," noiselessly and smoothly, over paved city streets, or rockiest, ruttiest, country roads. Practically no repairs and low maintenance.

Solid Rubber Tires—no pneumatics to collapse. Air-cooled—no water to freeze. Holsman features are all fully patented.

Two simple hand levers regulate entire control—start, steer, stop, reverse and brake. No live axles, friction clutches, differential gears, pumps, etc. Double hill-climbing power in reserve. Send today for **Handsome Booklet—Free.**

HOLSMAN AUTOMOBILE COMPANY
692 Monadnock Block CHICAGO, ILLINOIS

B

Figure 2.17. Buggies.
(A) Source: McClure's, April 1904, 115.
(B) Source: Life, May 16, 1907, 670.

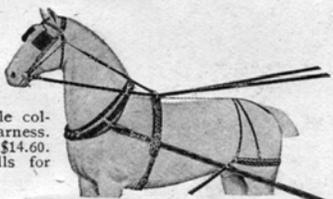
No. 331.
Canopy
Top Surrey. Price
complete, \$65.50. As
good as sells for \$25
more.



33 YEARS SELLING DIRECT

Our vehicles and harness have been sold direct from our factory to user for a third of a century. We ship for examination, approval, and guarantee safe delivery. You are out nothing if not satisfied as to style, quality and price. **We are the largest manufacturers in the world selling to the consumer exclusively.** We make 200 styles of Vehicles, 65 styles of Harness. Send for large free catalog.

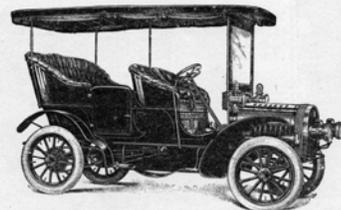
Elkhart Carriage and Harness Mfg. Co.
Elkhart, Indiana



No. 10. Single collar and Hame Harness. Price complete, \$14.60. As good as sells for \$5. to \$8. more.

A

Rambler



SURREY, TYPE TWO is an unusually beautiful, comfortable, powerful vehicle for touring. The big, luxuriously upholstered seats easily accommodate the average family; while an extra tire and personal luggage may be stowed under the seats. The canopy top, water-proof side curtains, plate-glass swinging front make it possible to travel in all kinds of weather. **\$2000**, complete with lamps, tools, etc. Full information on request. Other models \$750, \$850, \$1350, \$3000.

THOMAS B. JEFFERY & COMPANY
Main Office and Factory: Kenosha, Wisconsin
Branches, Boston, Chicago, Philadelphia
New York Agency, 134 West Thirty-eighth Street
Representatives in all other leading cities

B

Figure 2.18. Surreys.

(A) Source: Ladies Home Journal, March 1906, 48.

(B) Source: Life, January 19, 1905, 62.

Spider Stanhope

Seashore or Country

Resorters, golfers, town or village residents find the "Spider Stanhope" the fittest for their needs. Perfectly correct, it combines in harmony the style and convenience



of the Stanhope with the Spider characteristics—Dickey seat—new style dash—rich and graceful scrolled body loops resting on rubber—head elliptical springs.

Our free booklet, "That Carriage Matter," saves you money by buying direct, tells the carriage buyer and illustrates beautifully vehicles of proper style for every need in city or country, and gives reliable and valuable carriage information. Send for it—postal brings it.

MORRIS WOODHULL, Mfr., Home Ave. and 5th St., Dayton, O.

A

Studebaker

"THE AUTOMOBILE WITH A REPUTATION BEHIND IT"

Electric Stanhope
Model 22b
Price \$1250



FOR quick trips about town and into the suburbs—for all ordinary business and social requirements—here is a car which will grow daily in the esteem of its owner. Among vehicles of its type it is as supremely distinctive in smartness of style as is the \$4,000 Studebaker among gasoline touring cars; it has the same thorough construction—the same smooth action. Simple in operation and always absolutely under control, this car can be driven by women with perfect safety through crowded streets.

Four speeds, from 3 to 14 miles per hour. Will carry two passengers over ordinary streets 40 miles on one charge. We also build a Special Stanhope, Model 13a, having a mileage of 50 miles, and a maximum speed of 18 miles per hour. This model is especially adapted to the requirements of physicians and other professional men.

Other Studebaker electric models are the Runabout, Victoria-Phaeton and Coupe. Send for our new catalog of electric and gasoline cars.

STUDEBAKER AUTOMOBILE COMPANY
SOUTH BEND, IND.

Members Association of Licensed Automobile Manufacturers.

BRANCHES

NEW YORK CITY, Studebaker Bros. Co. of New York
CHICAGO, ILL., Studebaker Bros. Mfg. Co.
SAN FRANCISCO, CAL., Studebaker Bros. Co. of California
KANSAS CITY, MO., Studebaker Bros. Mfg. Co.
PORTLAND, ORE., Studebaker Bros. Co. Northwest
SEATTLE, WASH., Studebaker Bros. Co. Northwest
SALT LAKE CITY, UTAH, Studebaker Bros. Co. of Utah
DENVER, COL., Studebaker Bros. Mfg. Co.
DALLAS, TEX., Studebaker Bros. Mfg. Co.

SELLING AGENTS

BALTIMORE, MD., Auto Supply and Storage Co.
BOSTON, MASS., Fenwick Motor Car and Supply Co.
CHARLESTON, S. C., Citizens' Electric Co.
CLEVELAND, OH., Central Automobile Co.
PHILADELPHIA, PA., Thomas, Lewis & Co.
PITTSBURGH, PA., J. E. McHenry Co.
RICHMOND, VA., F. A. V. Hill
SAYANNAH, GA., Krammer & Wrensen
ST. LOUIS, MO., Union Electric Light & Power Co.
TOLEDO, OH., Kirk Bros. Automobile Co.

B

Figure 2.19. Stanhopes.

(A) Source: Saturday Evening Post, May 6, 1899, 717.

(B) Source: Life, May 16, 1907, 671.



A light spider phaeton with basket seat and rumble with English canopy presents very smart and fashionable equipage.

— Anna Fox Collection

A

Studebaker

Studebaker Vehicles Win Blue Ribbons

Next to the horse himself nothing commands so much attention and admiration at the Summer Horse Show as the fine vehicles with which he is shown.

Since the establishment of this most notable of Summer events

Studebaker

has occupied the foremost place as a builder of vehicles for this special purpose—types which not only embody the very finest material and construction, but which are recognized as authoritatively correct to the very last detail of style.

It is characteristic of Studebaker methods that the uses for which a vehicle is destined are thoroughly studied in advance and each requirement anticipated.

This thoughtfulness is exemplified in the vehicle shown, which is representative of the extensive line of Studebakers embracing types suitable for practically every purpose. It is likewise evident in every piece of fine Studebaker harness—carried in stock at all Studebaker repositories and displayed in conjunction with vehicles and accessories designed for the best American stables.

Studebaker Bros. Mfg. Co.
SOUTH BEND, IND.

REPOSITORIES:
NEW YORK CITY—Studebaker Bros. Co. of New York, Broadway and 40th St. and 36 Warren St.
CHICAGO, ILL.—Studebaker Bros. Mfg. Co., 373 and 381 Wabash Ave.
KANSAS CITY, MO.—Studebaker Bros. Mfg. Co., 12th and Hickory St.
SAN FRANCISCO, CAL.—Studebaker Bros. Co. of California, Market and 24th St.
PORTLAND, ORE.—Studebaker Bros. Co., Northwest, 330 and 335 E. Morrison St.
SEATTLE, WASH.—Studebaker Bros. Co., Northwest, 328 First Ave., S.
SALT LAKE CITY, UTAH—Studebaker Bros. Co. of Utah, 137 and 139 State St.
DENVER, CO.—Studebaker Bros. Mfg. Co., 12th & Blake St.
DALLAS, TEXAS—Studebaker Bros. Mfg. Co., 317-319 Elm St.

George IV. Phaeton

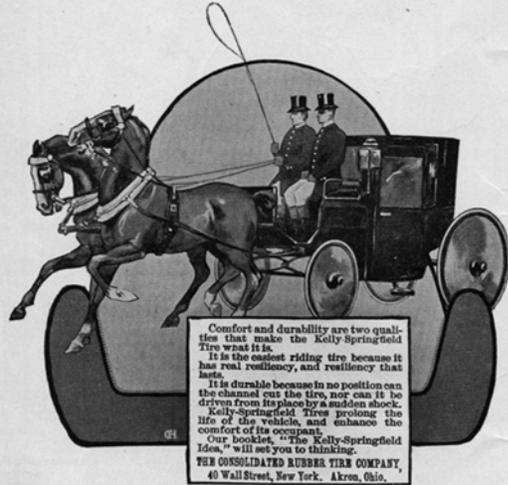
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Figure 2.20. Phaetons.

(A) Source: Charles Philip Fox, Working Horses: Looking Back 100 Years to America's Horse-Drawn Days: With 300 Historic Photographs. 1st ed. (Whitewater, WI: Heart Prairie Press, 1990), 150.

(B) Source: Life, June 1907, 757.

The Kelly Springfield Tire



Comfort and durability are two qualities that make the Kelly Springfield Tire what it is.
 It is the easiest riding tire because it has real resiliency, and resiliency that lasts.
 It is durable because in no position can the channel cut the tire, nor can it be driven from its place by a sudden shock.
 Kelly-Springfield Tires prolong the life of the vehicle, and enhance the comfort of its occupant.
 Our booklet, "The Kelly-Springfield Idea," will set you to thinking.
THE CONSOLIDATED RUBBER TIRE COMPANY,
 40 Wall Street, New York. Akron, Ohio.

A

DÉCAVILLE

IMPORTED

"That Decaville Car"

12-16 H. P. BROUGHAM

"THAT Decaville Car" about which you hear so much, is its own best advertisement. In order to appreciate how convincingly it speaks for itself, you must visit our exhibit at the Importers Automobile Salon now being held at the Herald Square Building, Broadway and Thirty-fourth Street and see our models for 1905. They include 12-16, 16-20, 24-28, 30-35, and 45-60 H. P. cars which will be demonstrated to the complete satisfaction of the most exacting purchaser. The features embodied in these new models are, first of all, "that steel pan" which, together with our double system of ignition, (60) high-tension magnets and accumulator, combined with refinement of detail, strength and simplicity of construction, constitute the principal "talking points" of the most satisfactory all-round French car on the market today. These cars have been built for the last ten years by the Société Decaville de France, whose factory is the pride of European engineers, and, to say the least, you owe it to yourself to give "That Decaville Car" a sitting up before making your final selection. If you wish to enjoy the fine early-Spring riding, place your orders NOW.

Patented Nov. 3, '01; June 21, '02; May 11, '03.

Sole American Agent, **Standard Automobile Company, of New York.**
Licensed Importer under Patent

Saleroom: 136 West 38th Street	Garage: 1684 Broadway
-----------------------------------	--------------------------

B

Figure 2.21. Broughams.

(A) Source: Life, March 3, 1904, 200.

(B) Source: Life, January 19, 1905, 58 (inside front cover).

Interchangeability in Form at a Cheaper Price

The Automobile in 1903 observed that carriage makers would be forced to start manufacturing automobile bodies or risk losing their best artists and workmen to those who were in the automotive business. Such dilemmas were indicative of the motorcar's invasion of the socioeconomic infrastructure built around the horse. The carriage maker had to choose between selling his business to an automotive manufacturer and joining the industry himself.

In practice he generally chooses to become financially interested in an automobile firm or to sell out to one. In either case *there is a merging of carriage traditions and new automobile requirements*, which will result in more attention being paid to distinctive styles in automobiles and appropriate names for each of them. And nothing is admittedly more difficult than to devise brand new names for new commodities, *those developed in the carriage industry will be preserved in so far as possible*.¹⁵⁰ (emphasis mine)

Despite the effort to protect the horse-drawn carriage industry from the invasion of the motorcar, a purposeful copying of styles ensued. However, similar to horse-drawn carriages, there were no uniformly accepted definitions of styles and classes in motorcars.¹⁵¹ For example, for runabouts, among the simpler carriages designed to carry two passengers, there was no single generalized standard specification.¹⁵²

Despite the collaboration of several hundreds of men to standardize definitions of various types of styles and classes of carriages, they “apparently [were] not [. . .] able to discover a uniformly accepted basis for definitions of the various styles or classes of carriages”¹⁵³ (Figure 2.22–Figure 2.23). Runabouts were generally

¹⁵⁰ Marius C. Krarup, “Influence of Carriage Styles on the Construction of Automobiles,” The Automobile, April 11, 1903, 397.

¹⁵¹ Krarup, “Influence of Carriage Styles on the Construction of Automobiles,” 397.

¹⁵² “The Selection of a Gasoline Automobile According to Price,” The Automobile, April 18, 1903, 424–425.

¹⁵³ Krarup, “Influence of Carriage Styles on the Construction of Automobiles,” 397.

described as “light, handy open wagons,” but “chelsea” cars also came to assume the same characteristics, creating much overlap.¹⁵⁴

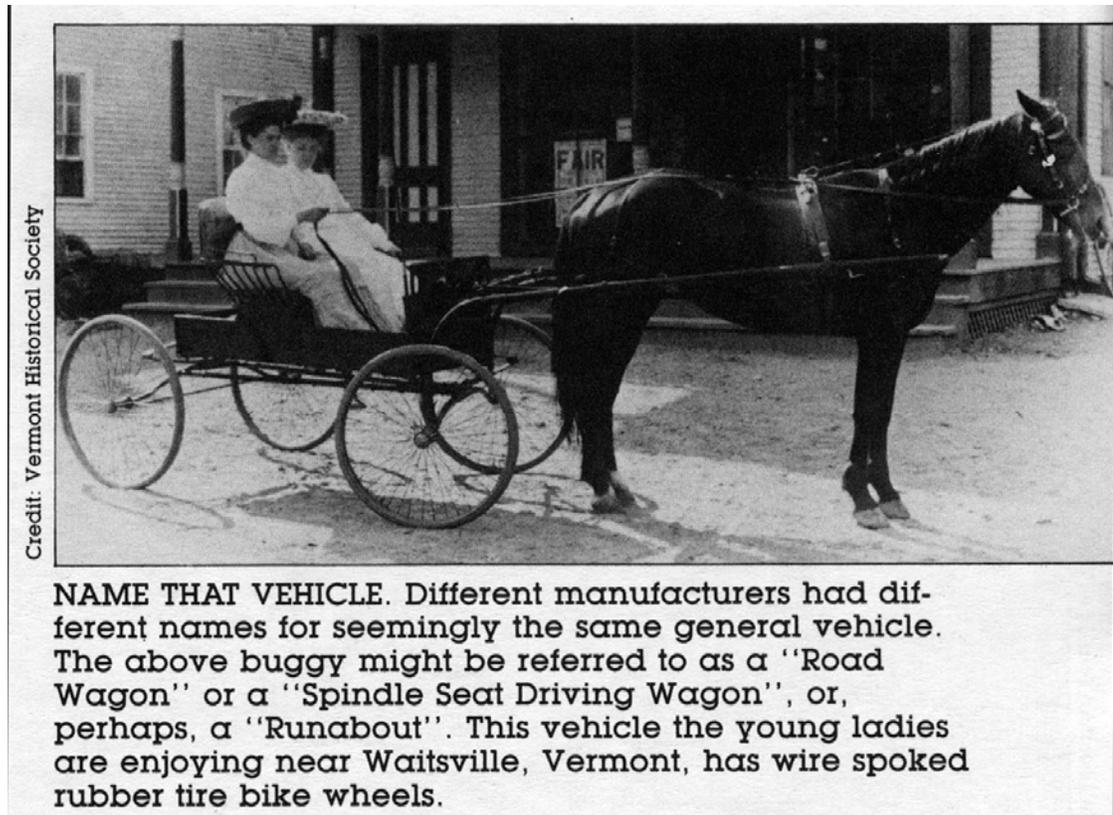


Figure 2.22. Naming of Vehicles.

Source: Charles Philip Fox and Jean Van Dyke, Horses in Harness (Greendale, WI: Reiman Associates, 1987), 118.

¹⁵⁴ Krarup, “Influence of Carriage Styles on the Construction of Automobiles,” 397–398.

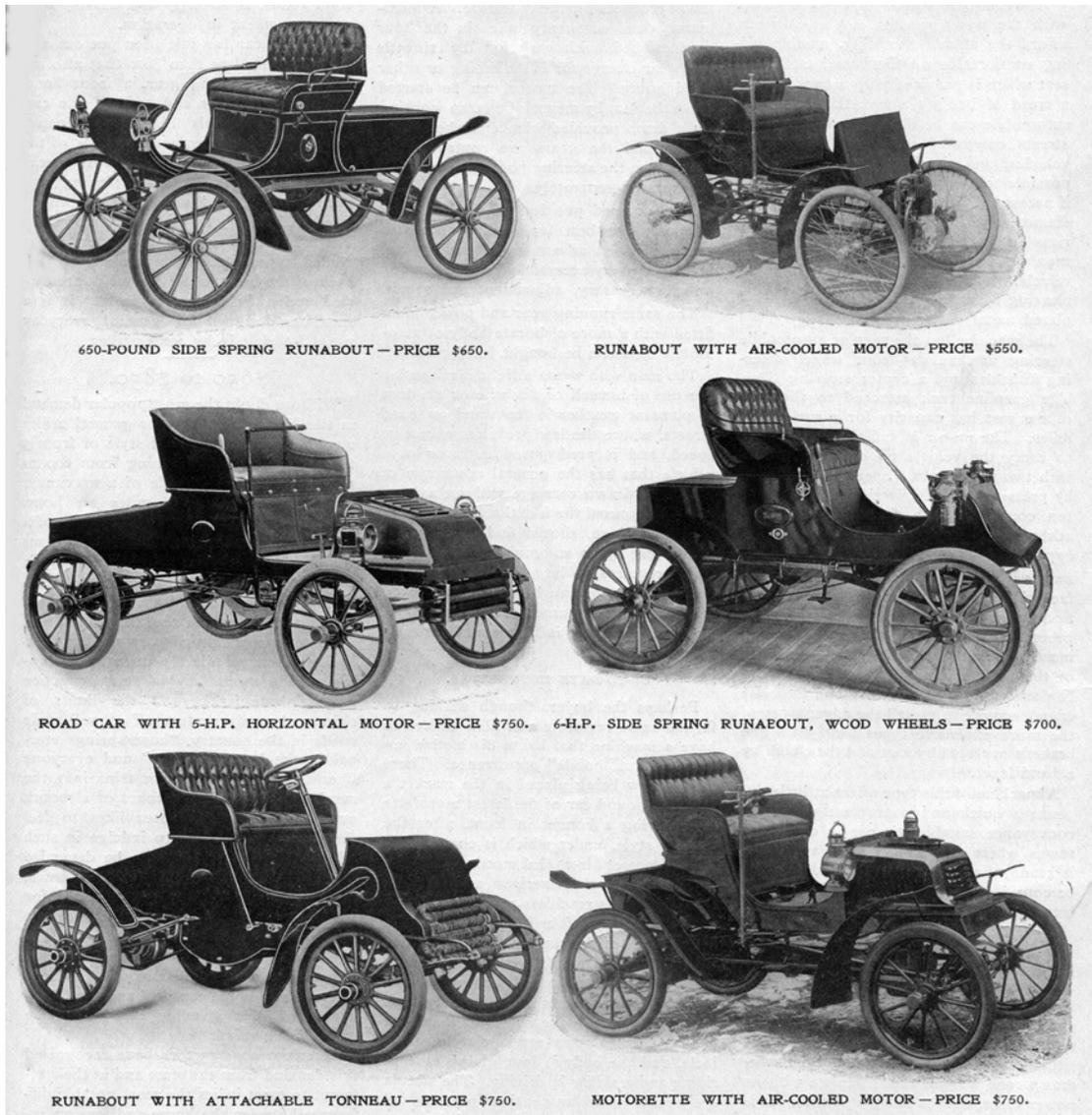


Figure 2.23. Runabout Varieties.

Source: The Automobile, 1903, 423.

Nevertheless, a likeness between the motorcar and the horse, including the horse-drawn carriage, had been made as a way to domesticate the automobile into everyday life. While Silverstone speaks largely of individual and social group experience, such as families imprinting new technological artifacts with their own identities,¹⁵⁵ the automobile case in this chapter speaks more of methods to change the

¹⁵⁵ Roger Silverstone, Television and Everyday Life (London: Routledge, 1994), 174.

general public's impressions of the automobile and the efforts exerted to overcome its notorious reputation.

Early adopters of the automobile at this time were in precarious company. On the one hand, a recalcitrant but apathetic group of users, such as the reckless rich and irresponsible chauffeurs, generated bad publicity for the automobile; on the other hand, a group of users, such as the owner of the Times Herald, sought to generate goodwill for the automobile but attacked everyone else—at least anyone who caused adverse publicity for the automobile.

The unpleasant effects of bad publicity were such that any buyer in 1903, for instance, was assured by articles such as those published in The Automobile of the possibility of purchasing an automobile without attracting too much attention.

The purchaser can, at the same price [\$500], also secure an automobile carriage in its simplest form, fitted with piano-box body and upholstered seat with capacity for two persons sitting side by side. *This has the general appearance of the light horse-drawn road wagon*, and, complete with its power plant, weighs but 550 pounds (emphasis mine).¹⁵⁶

It is also possible that the copying of the designs of horse-drawn wagon emerged seamlessly from pre-existing practices from the horse industry. Indeed, for those brave souls who sought to try the new mechanical device, the art of purchasing automobiles was patterned on the art of purchasing horse-drawn carriages. Laird describes early advertisements involving technical discussions and the lengthy exchange of mechanical information between manufacturers and buyers;¹⁵⁷ it is possible that this practice evolved from the tradition of ordering buggy parts in which buyers needed to be fully acquainted with the inner workings of their machine.

At the same time, manufacturers purposefully promoted assimilation of the automobile by instructing the buying public to transfer pre-existing practices from the

¹⁵⁶ "The Selection of a Gasoline Automobile According to Price," 424.

¹⁵⁷ Laird, "The Car Without A Single Weakness," 797.

horse culture into a new mechanical medium. A 1904 Pierce automobile advertisement talked of “the education of the automobilist” as a matter of transferring knowledge about horse buggies to automobiles, including criteria for purchase, such as price versus quality. With the predominance of cheap automobiles in the market during the first decade of the century, a Pierce advertisement attempted to render price a non-issue by emphasizing the importance of quality. The cost rationale remained equally compelling. Automotive advertisements sought justification by appealing to the pre-existing practice of acquiring a horse and a buggy:

A man buys an auto just as he formerly bought a buggy. The first time a man buys a buggy he buys a cheap one, because price is the only thing he understands about buggies. After he has had some experience, quality comes before price, and nothing but the highest grade carriage will satisfy him after that.¹⁵⁸

At this time, a price war between horses and motorcars motivated many manufacturers to provide a cost rationale for the automobile. Many motor buggy companies, particularly during 1907 and 1908, advertised their products as being “cheaper than horses.” The Lindsley delivery car, at \$375, was claimed to have a 30-mile-per-gallon fuel efficiency, which meant that its operation was “much cheaper than horse help.”¹⁵⁹ The Kiblinger, advertised frequently in 1907 and 1908 in Collier’s, was claimed in large, bold print to be “cheaper than horses.”¹⁶⁰ The Brush Runabout was advertised to “cost less to run than a horse.”¹⁶¹ A brand new runabout in 1911 was claimed to be the same price (\$350) as a good horse outfit.¹⁶² Reliable Dayton, which also ran the same advertisement for many years in Collier’s, claimed

¹⁵⁸ Life, June 2, 1904, 1127.

¹⁵⁹ Collier’s, May 23, 1908, 27.

¹⁶⁰ Collier’s, 1907–1908.

¹⁶¹ Collier’s, February 22, 1908, 18.

¹⁶² “The Poor Man’s Automobile,” The Horseless Age, July 12, 1911, 49.

that its vehicle was “more economical and serviceable than a horse,” and while it might not be lowest in price, it would be the “cheapest in the end.”¹⁶³

Rapid claimed that its commercial cars saved their owners anywhere from \$500 to \$1200 per year.¹⁶⁴ A large Brooklyn, New York department store was touted to have saved \$1,360 during a six-month period by replacing its horse wagons with motor trucks for delivery.¹⁶⁵ The Metz Company published a customer testimonial in 1909 professing that their new motor vehicle “ha[d] taken the place of two driving horses” and that its upkeep cost was considerably less than that of maintaining one horse.¹⁶⁶ In the same year, Maxwell Motor Car advertised that its business runabout “costs less to keep than a horse and buggy” because “when not in use expenses stop,” whereas “a horse eats all the time.”¹⁶⁷ Some advertisements phrased it as a matter of the motorcar “not eating its head off when standing still.”¹⁶⁸

In 1910, Maxwell Motors printed a full-page advertisement entitled “Automobile vs. Horse,” which was purported to conduct a “disinterested” cost comparison between the automobile and the horse and buggy under the supervision of the Contest Board of the American Automobile Association.¹⁶⁹ After several days of test runs for six hours a day, the board concluded that the automobile was cheaper to operate. The advertisement proclaimed,

This is our answer to the charges made that the automobile is an extravagance. It proves the automobile an economic factor that would save millions if the Maxwell were everywhere substituted for the horse and buggy.¹⁷⁰

¹⁶³ Collier's, 1907–1908.

¹⁶⁴ Collier's, 1908.

¹⁶⁵ “Motor Trucks Cheaper Than Horses,” The Horseless Age, April 12, 1911, 632.

¹⁶⁶ The Horseless Age, December 29, 1909, 35.

¹⁶⁷ The Horseless Age, December 8, 1909, 7.

¹⁶⁸ *Ibid.*, 9.

¹⁶⁹ The Horseless Age, October 26, 1910, 3.

¹⁷⁰ *Ibid.*

Advertisers took the approach of showing how the automobile was a machine to be taken *seriously* for its potential to “save millions” of dollars.

As late as 1916, the cost justification campaign continued. The Federal Motor Truck Company, for instance, advertised that it reduced “horse-drawn haulage costs to fractions” when it replaced the “horse-drawn methods of yesterday” with motor power.¹⁷¹ While these advertisements were geared toward enticing horse and buggy users to the automobile, they implied that the automobile was the “new horse of today.” By virtue of its association with the horse, the automobile came to justify its purpose. By virtue of its cost-saving claims, it justified itself as a replacement for the horse.

Interchangeability in Operation

Prospective automobile drivers were soon convinced that the newfangled machines could be operated just like horse-drawn carriages. The Pope Manufacturing Company, famous for its bicycles, launched a Columbia motor carriage advertisement in 1898—one of the earliest¹⁷²—claiming that “any one can learn to control it in ten minutes.”¹⁷³ In 1901, Toledo advertised its steam carriage to be so simple that “a woman can operate it conveniently.”¹⁷⁴ In the same year, Columbia advertised its cars to be “easily operated by man, woman or *child*” (emphasis mine).¹⁷⁵ As late as 1909, the Maxwell Motor Company advertised its gasoline cars as being so easy to drive that one’s “wife, daughter or son” could run and care for it.¹⁷⁶ As late as 1913, the Haynes

¹⁷¹ Life, January 13, 1916, 85.

¹⁷² According to Frank Luther Mott, author of the well-respected History of American Magazines 1885–1905, the first consumer automobile advertising appeared at the turn of the century, roughly around 1903. However, several consumer advertisements for automobiles had in fact appeared by the late nineteenth century.

¹⁷³ The Century, October 1898.

¹⁷⁴ The Atlantic Monthly, June 1901.

¹⁷⁵ Collier's, September 21, 1901, 4.

¹⁷⁶ Horseless Age, December 8, 1909, 7.

gasoline motorcar was proclaimed a children's product that "even women and children can drive [...] with enjoyment and safety."¹⁷⁷

Thus in addition to being economically sensible, the automobile was presented as being as easy to operate as a horse. Women and children had been known to operate horseless carriages and thus, the argument was, if motorcars could be considered a replacement for horses, then women and children could operate them as well. A 1903 Life magazine illustration suggests that children, particularly the rich, received automobiles as presents and were allowed to operate them.¹⁷⁸ Illustrations of this type were published for several years, with pictures of gleeful children driving automobiles in most dangerous circumstances (see Figure 2.24).¹⁷⁹

A sixteen-year-old boy working for an automobile and repair company was given an official license to operate all classes of automobiles, including trucks, in 1903.¹⁸⁰ Three years later in 1906, a fourteen-year-old boy was licensed as a chauffeur and made long trips around Fresno, California during the busy fruit season.¹⁸¹ Efforts were made to normalize automobiles and render them as harmless as horses such that women and young adults were deemed capable of controlling these machines.

¹⁷⁷ Life, September 25, 1913, 533.

¹⁷⁸ Life, January 1, 1901, 9.

¹⁷⁹ Life, January 6, 1910, 40.

¹⁸⁰ "Boy Knows His Car," The Automobile, October 17, 1903, 412.

¹⁸¹ "Youthful Pacific Coast Driver," The Automobile, January 22, 1906, 425.



Figure 2.24. Illustration, Life, January 1, 1903, 9.

An Oldsmobile advertisement of 1903 suggested that the controls for a gasoline vehicle required the same intuitive skills used to direct horses: “the controlling mechanism is simple, strong and instantly *responsive to the will of the driver*, giving a sense of perfect security” (emphasis mine).¹⁸² While no explicit mention of the horse was made in this ad, the automobile is given life in these descriptions—the unthinking motor suddenly becomes responsive to non-mechanical influences such as the “will” of the driver. A similar description appeared in a 1904

¹⁸² Life, March 12, 1903, 3.

Northern automobile advertisement in which the motor was described to run smoothly and to give “instant obedience,”¹⁸³ again insinuating a form of a sentient machine.

While such descriptions would seem strange in modern-day advertisements, the early nineteenth century sensibility must have been quite attuned to working with living things; thus the terms “obedience” and “will,” befitting the training and handling of animals, were employed to make the motor seem more familiar. Indeed, manufacturers strained to make motor and muscle power operationally equivalent. Advertisements promoted automobiles as operating just like horse-drawn carriages.¹⁸⁴ The Autocar Company splashed its ad in Life magazine claiming its controls were “Simple As a Pair of Reins.”

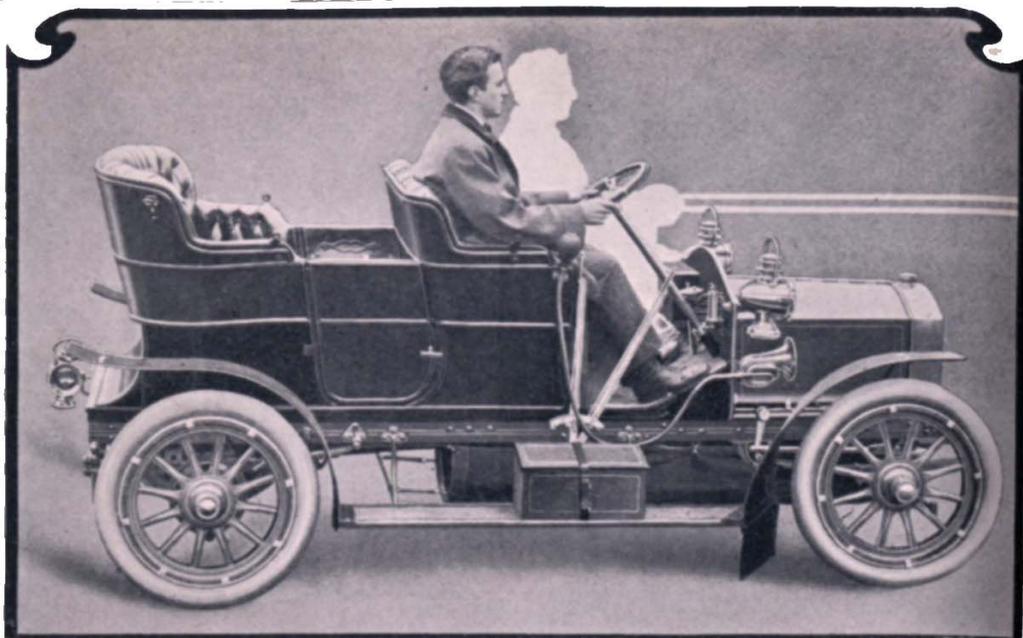
The control of Type XI Autocar brings automobile driving to the simplicity of horse driving. In the rim of the steering wheel, and forming parts of it, are set two grips, one at the right hand, one at the left. These two grips control the throttle and the spark, regulating the speed of the car from 3 to 35 miles an hour. This arrangement brings the steering and the speed regulating together, so that in all ordinary running the only position necessary for the hands is on the steering wheel.¹⁸⁵

The positioning of the accelerator on the steering wheel employed automobile controls that mimicked the experience of operating the reins of a horse-drawn carriage (Figure 2.25).

¹⁸³ McClure's Magazine, June 1904.

¹⁸⁴ Advertising work during this period generally involved spinning “webs of association around a product.” For more information on advertising practices, see Richard Ohmann, Selling Culture: Magazines, Markets, and Class at the Turn of the Century (London: Verso, 1996), 100–106.

¹⁸⁵ Life, August 17, 1905.



The New AUTOCAR Control Simple As a Pair of Reins

The control of Type XI Autocar brings automobile driving to the simplicity of horse driving. In the rim of the steering wheel, and forming parts of it, are set two grips, one at the right hand, one at the left. These two grips control the throttle and the spark, regulating the speed of the car from 3 to 35 miles an hour. This arrangement brings the steering and the speed regulating together, so that in all ordinary running the only position necessary for the hands is on the steering wheel.

To be sure this car has a gear shift lever and an emergency brake lever at the right of the driver. The gear shift lever, however, is needed only on particularly hard hills, or very bad bits of road. The car loaded with four passengers will climb nearly all hills on the high gear. The foot brakes being ample for all ordinary use, the emergency brake is rarely required. Hence we say that except in extreme cases only one position is required of the hands in driving Type XI Autocar.

This car has four cylinder vertical motor of 16-20 horse power, double side entrance tonneau, and the smartest lines of any car. It is extremely quiet and vibrationless in running while having great power in proportion to its weight. Type XI Autocar is the ideal car for the man who wants an up-to-date, powerful four passenger car without excessive weight. The price of Type XI is \$2000. Catalogue giving full description of it and also of Type X Runabout \$900, and Type VIII Tonneau \$1400, together with name of dealer nearest you, sent free upon request.

THE AUTOCAR COMPANY, ARDMORE, PA.

Member Association Licensed Automobile Manufacturers.

Figure 2.25. Steering Wheels Touted as Reins.
Source: Life, September 7, 1905, 266 (inside front cover).

However, unlike the horse-drawn carriage, in which the effects of starter, brakes, accelerator, and steering wheel resulted from the manipulation of the reins, the motorcar separated these functions into different control mechanisms. Levers and switches had to compensate for the sensibilities of the horse, particularly in braking

and maneuvering. The driver had to pay close attention to the brakes, which constituted another lever. Nevertheless, advertisers strained the parallelism by adding some qualifications:

To be sure this car has a gear shift lever and an emergency brake lever at the right of the driver. The gear shift, however, is needed only on particularly hard hills, or very bad bits of road. The car loaded with four passengers will climb nearly all hills on the high gear. The foot brakes being ample for all ordinary use, the emergency brake is rarely required. Hence we say that except in extreme cases only one position is required of the hands in driving Type XI Autocar.¹⁸⁶

The concerted effort to downplay these compensating devices resulted from a desire to convince users that skills employed in the driving of horses were transferable to cars. However, ease in mechanical operation was not the same as riding a horse, although some pro-car advocates discounted differences in any form. According to C. E. Woods, “The simplicity attached to the operation of an electric vehicle by any person of ordinary intelligence is too well-known to need comment at this point; the same care needed to drive horses is the same as driving an electric vehicle.”¹⁸⁷ The implication was that if one knew how to manage horses, then one must also be naturally proficient in managing cars; however, such was not the case.

A training course for automobile drivers¹⁸⁸ in 1899 strained to make the parallelism work. The driving school described the steering-lever as similar to the steering of horse-propelled vehicles; it turned the rear wheels rather than the front. However, a more detailed description of the automobile driving technique betrayed the school’s effort to shift skills from horse to car handling. The school estimated a week

¹⁸⁶ Ibid.

¹⁸⁷ C. E. Woods, *The Electric Automobile*, 16.

¹⁸⁸ Automobile drivers supposedly could earn anywhere from \$25 to \$100 in 1907–1908 according to the advertisements of the New York School of Automobile Engineers placed in *Collier’s* and *Life*. The school guaranteed job placement after two months of home study. Many jokes were made regarding the competence of drivers at this time, typified by a *Life* illustration of an owner tossed out of the car in a nasty accident demanding that his chauffeur tell him where he learned to drive, to which the driver replied, “In a correspondence school, sir.” See *Life*, May 24, 1906, 663.

of training (rather than 10 minutes) was required to “manage all the brakes and levers with perfect presence of mind.”¹⁸⁹ The actual driving was described as follows:

Both of his hands and both of his feet are fully employed. With his left hand he manages the power lever, pushing it forward one notch at a time to increase the speed. With his right hand he controls the steering-lever, which, by the way, turns the rear wheels and not the front ones, as is done with horse-propelled vehicles. His left heel is on the emergency switch, and his left toes ring the gong. With his right heel he turns the reversing-switch, and he can apply the brake with either his right or his left foot. When he wishes to turn on the lights, he presses a button under the edge of the seat. Hence, he is very fully employed, both mentally and physically. He can't go to sleep and let the old horse carry him home.¹⁹⁰

This highly involved physical and mental activity, that is, the use of left and right heels to turn various switches, the use of the left toe to ring a gong, and so forth, constituted textbook driving. In practice, driving appeared to be even more complex and counter-intuitive for anyone accustomed to riding a horse. In fact, a comprehensive article advising the novice on how to purchase a car, covering topics from price considerations to the various motor and style options, admitted that in the end, it all came down to a matter of driving competence: “the great, essential fact that the beginner is apt to forget is that, for him, the first consideration is not to get a car whose power, size, and style meet every whim that he can devise, but *to get a car that he can run.*”¹⁹¹ Thus the skills required to drive a horse-drawn carriage did not seamlessly transfer to driving an automobile, but a forced likeness was made.

A seasoned car driver described the many difficulties of learning the various nuances of early cars, such as the lack of an efficient means to prevent a car from running backwards if stopped on a hill, even with a first-class machine such as the Daimler.¹⁹² He learned from experience that when a car ran backward, the best way to

¹⁸⁹ Ray Stannard Baker, “The Automobile in Common Use,” McClure's Magazine, July 1899, 202.

¹⁹⁰ *Ibid.*

¹⁹¹ Herbert L. Towle, “The Best Car for the Novice?,” The Automobile, October 12, 1905, 395.

¹⁹² Dawson Turner, “Some Experiences With Modern Motor-Cars,” 638.

make it move forward was actually to put the reverse gear into action.¹⁹³ Clearly such peculiarities found in machines operating on actual roads and in traffic provided another learning gap that a driver had to quickly bridge; he must teach himself as he drove along. The qualifications made by the earlier Type XI Autocar advertisement regarding the rare use of the gear shift lever and emergency brakes were clearly understated, particularly since “bad” roads were the norm at that time.

The greater demand on the driver’s mental and physical faculties was such that some companies built engines that could be operated with reins in order to facilitate the transition from driving horses to motorized tractors.¹⁹⁴ The advertisement for the Klaxon horn, for instance, described the “pressure of [its] button” as warning horses to keep them at bay “as surely as if you held in your own hands the reins of every horse ahead.”¹⁹⁵ This effort to connect mechanical switches, buttons, and levers directly to horses and reins signifies a purposeful effort to transfer concepts and practices associated with the horse to the motorcar. A slew of advertisements strained to make the newfangled machine interchangeable with the horse in form and functionality despite their pronounced differences.

Works like a Horse but Better

It is not surprising that pro-horse advocates taunted automobile adopters as unaware of the differences between motor and muscle power, because advertisers attempted to make them interchangeable. Automobile advertisers took every opportunity to describe motor performance in terms of the work traditionally performed by horses. As early as 1901, the Triumph Motor Vehicle Company advertised that its automobile “climb(s) any hill a horse can climb,” and that it “carries

¹⁹³ Ibid.

¹⁹⁴ Reynold Wik, Henry Ford and Grass-roots America (Ann Arbor: University of Michigan Press, 1972), 100.

¹⁹⁵ The Horseless Age, December 15, 1909, 14.

two people, and will go over any road a horse could travel on.”¹⁹⁶ This direct association with horses could also be seen in an advertisement for an Oldsmobile whose range of applications was posted simply as “an entire stable of horses in itself.”¹⁹⁷ The Reliable Dayton Motor Car, which ran the same ad for at least three years from 1907 to 1909, was claimed to be “the First Real Successor to the Horse” because it had “the same reliability as the horse.”¹⁹⁸ The Herreshoff car in 1909 was described as “the smart, light cob of the automobile stable.”¹⁹⁹

These direct appeals to the functionality and capabilities of the horse provided advertisers the means to orient consumer perception of cars as useful devices. Advertisers presented their automobiles as capable of accomplishing any function performed by horses, with faster and better results. A more explicit comparison between literal horse power and figurative horsepower came from a 1905 advertisement of the Autocar Company:

The Auto Runabout has a motor of 10 mechanical horsepower which is about equivalent to 15 animal horse-power.

The horses, however, could furnish this power for only 8 hours a day. As the Autocar Runabout can be run for 24 hours a day, it will be seen that if both power and endurance are considered this car is equal to 45 horses.²⁰⁰

In directly translating mechanical horsepower in terms of animal horse power, advertisers sought to display in quantifiable terms the superiority of motor performance over horses. Indeed, Kiblinger Motor Wagons, which often advertised in the front pages of Collier's, sometimes right under the editorial bulletin, claimed that not only would its machine “climb hills easier than horses,” but also that it would “do

¹⁹⁶ Collier's, March 23, 1901, 24.

¹⁹⁷ Life, May 16, 1907, 669.

¹⁹⁸ Collier's, 1907–1909.

¹⁹⁹ Collier's, January 16, 1909, 10.

²⁰⁰ Life, May and June 1905.

quicker work than 3 horses and wagons.”²⁰¹ A 1908 advertisement for the Lindsley claimed that it would “easily do the work of 5 delivery wagons of the horse kind.”²⁰² Rapid recommended “discarding the antique method of horse-drawn vehicles” and instead, “install[ing] motor wagons which cover 3 to 5 times as much territory as horse-drawn wagons, and give less trouble as they never tire, are easy to operate, and cost less to maintain.”²⁰³

The message of these advertisements was consistent, clear, and definitive: motorcars worked just like horse-drawn carriages except that they were far superior to them in performance and economy. Automobiles became continuously associated with horses while at the same time jostling to replace them. On one level, horses were expensive, inefficient, and weak, but on another level, motorcars worked just like horses. Manufacturers depended upon the horse to explain the automobile’s concept but, at the same time, discounted the horse in order to justify replacing it. The automobile had to become horse-like *and* unhorse-like at the same time.

This tension between continuity and discontinuity relates to the strength of pre-existing practices in defining the admissibility of new devices. Manufacturers recognized the entrenched position of the horse in people’s work routines and work processes. People carried out their work in terms of their conceptualization of the horse. Thus the automobile as a new technological artifact aspiring to replace the horse could not seek to disrupt work routines and processes by presenting itself as unlike the horse; instead it needed to prove itself a much “better horse.”

²⁰¹ Collier’s, September 5, 1908, 5.

²⁰² Collier’s, May 23, 1908, 27.

²⁰³ Collier’s, October 26, 1907, 29.

Recognizing Women's Patronage

A marked shift occurred indeed, an observer remarked in 1905, when the automobile shed its “machine”-like effect in order to become more “coach”-like.²⁰⁴ As late as 1923, advertisements such as that of Delco Electrical Systems still called automobiles “A Stage-Coach of Today” and considered them “modern successors of the old stage coaches.”²⁰⁵ The move toward a coach-like effect in automobile construction came as early as 1900, when Woods Motor Vehicle advocated the car for personal transport rather than for sport, describing its motor carriage as the “lightest, smartest-looking and most graceful Automobile ever built.”²⁰⁶ Several years later, the same emphasis on the “coach”-like properties of other makes and models was made with descriptions such as “luxurious upholstery and elegant finish,” “refinement in design,” “perfect taste,” and “essence of good form” typically used in many electric vehicle advertisements, such as that of the Thomas Town Car in 1908.²⁰⁷

Gasoline vehicles, on the other hand, emphasized the riding qualities of coaches. A 1909 Oldsmobile advertisement promoted large wheels as a protection against ruts, cracks or any “inequality of the road” that might compromise luxurious riding.²⁰⁸ The Brush Runabout in 1908 was claimed to “be durable, certain, comfortable, lively, handsome, almost noiseless, almost vibrationless and [to ride] like a baby carriage.”²⁰⁹ The more definitive “no vibration, noise or odor” phrase of the Riker Motor Vehicle, sometimes phrased as “if you appreciate in an Automobile Cleanliness, Freedom from Noise, Vibration, and Odor, you will buy a Riker,”²¹⁰

²⁰⁴ J. M. Davis, “A Carriage Trade Viewpoint,” 623.

²⁰⁵ The Saturday Evening Post, June 2, 1923, 43.

²⁰⁶ Collier's, April 28, 1900, 25.

²⁰⁷ Collier's, April 18, 1908, 4.

²⁰⁸ Life, June 24, 1909.

²⁰⁹ Collier's, February 22, 1908, 18.

²¹⁰ Collier's, June 30, 1900, 19.

hinted at some of the public relations battles that manufacturers faced in repackaging the automobile.

The transformation of the automobile from the early days of reckless driving—when the various sights, sounds, and smells it made repulsed the American public—required a shift in emphasis from the driving to the riding experience. Focusing on passenger comfort included addressing non-visible concerns, such as fears and apprehensions about the unruly machine. Advertisers such as Lindsley typified this effort, claiming that its car was “safe, *sane*, practical and durable” (emphasis mine).²¹¹ The terms “safe” and “sane” appearing in automobile advertisements suggest the pressure faced by manufacturers to ameliorate fears about the destructive image of the automobile. Consternation was a result of the actual riding experience, as exemplified by the Lindsley advertisement, which described its vehicle as appealing “to those ordinarily nervous when in a motor car” and “the safest car for women’s use.”²¹²

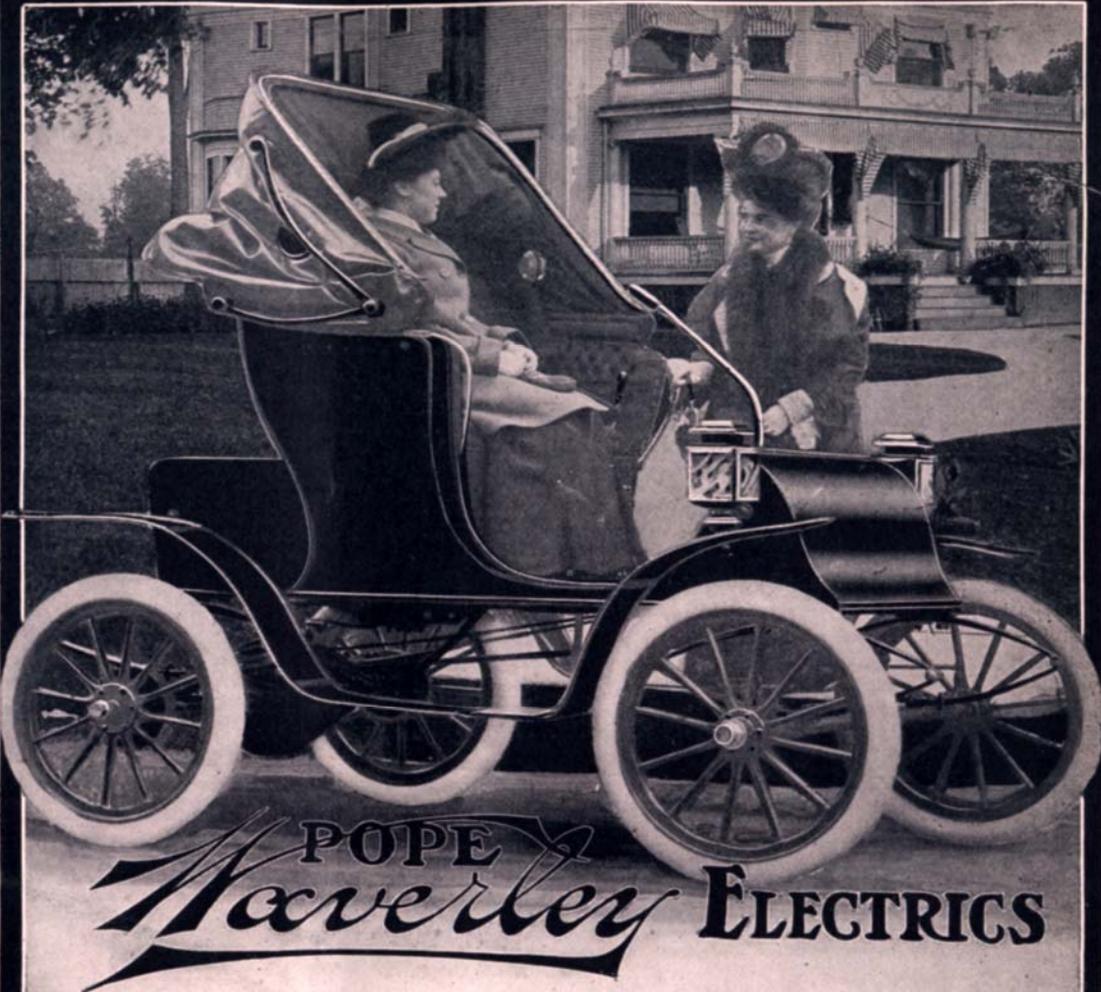
The focus on women as a customer base constituted another effort to associate cars with everyday life.²¹³ The functional use of the car in the 1904 Pope-Waverley advertisement listed female-related purposes first and foremost, claiming that “ladies prefer them [automobiles] for shopping and calling,” while business reasons came second, with appeals to physicians for their readiness and economy (Figure 2.26).²¹⁴

²¹¹ *Collier's*, May 23, 1908, 27.

²¹² *Collier's*, April 18, 1908, 4.

²¹³ Women at the turn of the century became purchasers and managers of commodities. Manufacturers through advertisements sought to establish a personal relationship with consumers to replace the role of merchants. (Ohmann, *Selling Culture*, 75–77).

²¹⁴ *Life*, June 2, 1904.



POPE
Waverley **ELECTRICS**

Are fast replacing horse-drawn vehicles because they are always ready, clean, noiseless, and simple to operate. Ladies prefer them for shopping and calling. Physicians adopt them instantly when once their readiness and economy is demonstrated. Above picture shows Pope-Waverley Stanhope Model 27, price \$1,400.

We also make Runabouts, Surreys, Chelseas, Special Physicians Road and Delivery Wagons. Complete 1904 catalogue with address of our depot in your vicinity on request.

POPE MOTOR CAR COMPANY, Indianapolis, Indiana.

Figure 2.26. Pope-Waverly Electric Car Advertisement, Life, June 2, 1904, 523.

One could argue that automobiles still served entertainment purposes at this time, but the emphasis was on the ability of the car to take its driver *somewhere* to be

entertained rather than on the driving experience itself as entertainment. A 1904 Oldsmobile advertisement promised to take a woman to an enjoyable destination: the Oldsmobile was an “ideal machine for any woman who enjoys the outdoor life” because it was “safe, reliable, easy to operate” and would bring her in perfect comfort to her destination, “rain or sunshine.”²¹⁵ The promise of a delightful afternoon was found in places, people, and various activities rather than in the automobile itself, signifying a move away from its sporting past and perhaps a move toward being an integral part of everyday life.

The transformation of the automobile to a mode of everyday transport can be understood in terms of the simultaneous equine and feminine articulations that sought to court an important consumer base. The move toward projecting a “coach”-like effect required the motor to be the equivalent of the horse not only in its functionality but also in its virtuous qualities. Franklin Motor Cars described its steam vehicles in 1904 as being “as sensitive and spirited as a thoroughbred horse.”²¹⁶ The emphasis on cars having the genteel qualities of thoroughbred horses appeared in many other earlier horse and buggy advertisements, such as that of the 1899 Spider Stanhope. Stanhope advertised the “perfectly correct” and harmonious style of its carriages and again used only women as drivers and passengers in its posters.²¹⁷

A Franklin Motor Car advertisement also featured a woman at the controls of its steam vehicle, with a man seated on the passenger side. Many automobile advertisements featured female drivers and passengers exclusively. The background undertones were feminine, evoking the coach by using phrases such as “light, flexible, ease of management, and extreme luxury” replacing the “unnecessary, heavy and troublesome” machine of the past.²¹⁸ The use of women as a domesticating device for

²¹⁵ *Saturday Evening Post*, April 2, 1904.

²¹⁶ *Life*, May 5, 1904, 399.

²¹⁷ *Saturday Evening Post*, March 25, 1899, 619.

²¹⁸ *Life*, 1904–1905; *McClure's*, 1904–1905.

the daredevil automobile enhanced the move toward the automobile's coach-like reputation because the image of the woman driver conveyed safety: it was observed that women were careful drivers and thus generally not involved in vehicle accidents.²¹⁹

Feminine descriptors intertwined with equine features appeared consistently in many advertisements in the early twentieth century regardless of the type of motor power used. Haynes-Apperson, in the early twentieth century, used women almost exclusively in many of its advertisements for its gasoline automobiles in Life and Collier's magazines. Woods Motor Vehicle similarly used only women in its advertisements.²²⁰ The extensive use of women in advertisements at that time constituted a different sensibility from their use in modern-day automobile advertisements.

Women in the early twentieth century were considered an influential consumer base and thus were depicted as potential customers, whereas modern-day advertisements tend to make decorative use of women.²²¹ In the advertisements of the early twentieth century, women were depicted in the driver's seat and were sometimes illustrated from a distance. Modern-day advertisements, on the other hand, show women as what Scharff calls "automotive accessories," as exemplified by a 1948 photo in her book in which a woman is used as a hood ornament.²²² Other more popular advertisements show women flanking automobiles in close-up provocative full-body poses, but rarely operating them.

The early woman automobile shopper, on the other hand, was described as "out in force" by 1906: she "looks over the automobile advertisements in the daily

²¹⁹ "Considers Women Most Careful Drivers," The Automobile, September 5, 1907, 332.

²²⁰ Collier's, April 28, 1900, 25.

²²¹ Scharff, Taking the Wheel, 167.

²²² See the 1948 photo in Scharff, Taking the Wheel, picture insert.

newspapers and makes the rounds of the salesrooms in about the same frame of mind that she would if she were shopping for a new bonnet.”²²³

Some observers believed that the entire automobile industry relied upon women’s patronage for its survival. As early as 1898, a writer noted the manner in which women had taken an interest in the new machine:

The women, strange to say, have from the first shown more enthusiasm than the men for the new vehicle. It is they who have been its most ardent promoters, who have organized horseless coaching excursions, given prizes for races—in short, created the first paying demand for a clean, speedy and reliable machine.²²⁴

The notion that women created the “first paying demand” for a practical automobile problematizes the commonly held gendered typifications of the car as a male domain that came to be usurped by women. Historian Scharff, for instance, argues that “the auto was born in a masculine manger, and when women became drivers, they had to overcome their own lack of confidence and combat both subtle and overt resistance.”²²⁵ Women supposedly appeared in many advertisements as passive figures seated next to a man.²²⁶

Historical data, however, show less timid and, in fact, highly participatory behavior among women. In 1901, an automobile writer described how women—“plenty of them”—were already driving their own automobiles.²²⁷ A 1901 advertisement in Collier’s described the Triumph automobile as a “swell carriage” for ladies without mentioning other prospective customers.²²⁸ In 1903, Oldsmobile, Haynes-Apperson, Searchmont, Cudell, and many other manufacturers used women almost exclusively in many of their advertisements. Even tire companies such as the

²²³ “Auto Women Shoppers,” The Automobile, May 3, 1906, 734.

²²⁴ Henri Dumay, “The Locomotion of the Future,” Collier’s, July 30, 1898, 22.

²²⁵ Scharff, Taking the Wheel, 13.

²²⁶ *Ibid.*, 167.

²²⁷ Herbert L. Towle, “The Coming of the Automobile,” Collier’s, January 12, 1901, 33.

²²⁸ Collier’s, 1901, 24.

Hartford Rubber Works Company generally depicted a woman behind the wheel in their advertisements during the years 1903–1904 (Figure 2.27).²²⁹ As late as 1908, Stepney Spare Wheel tires also used women in their advertisement in Collier's.²³⁰

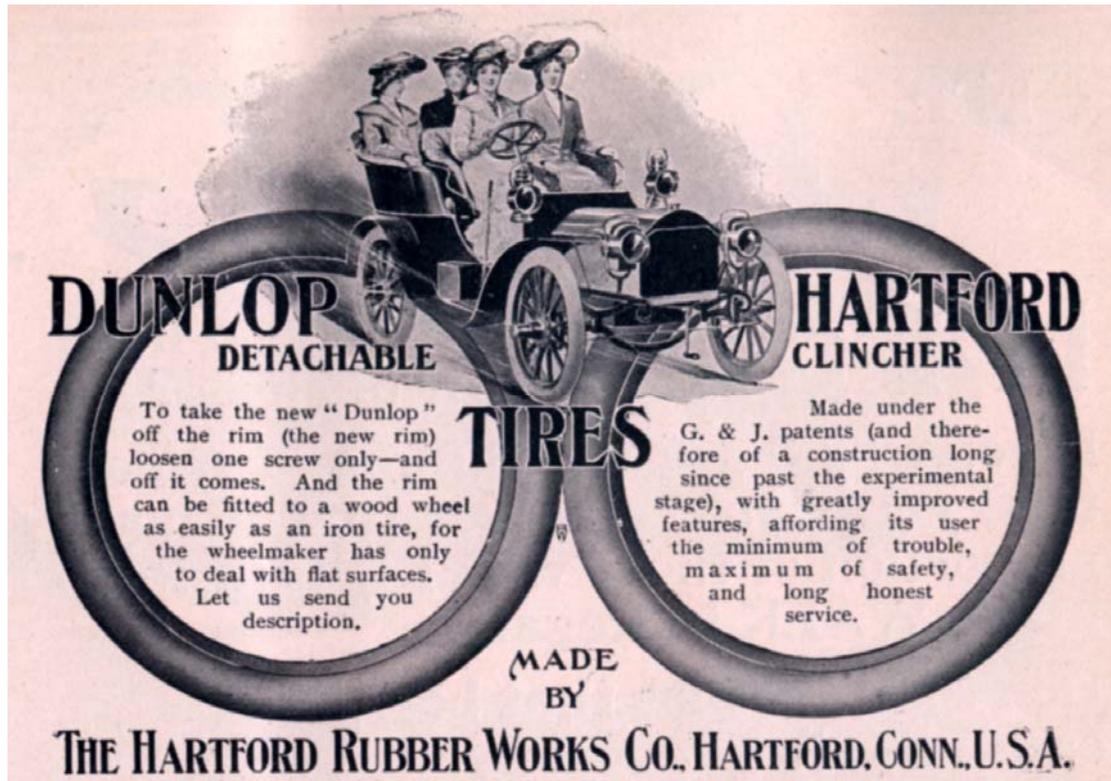


Figure 2.27. Dunlop Tire Advertisement, Life, April 7, 1904, 351.

In 1906, the Ladies Home Journal featured a story of an enterprising young woman who organized a two-week excursion for 24 girls, including a chaperone, for a trip from Philadelphia to the Delaware Water Gap, for only \$1.60 per day including expenses.²³¹ By this time, many women easily handled large touring cars, and a significant number of them owned and operated their own automobiles.²³² It was not

²²⁹ Life, April 9, 1903; May 5, 1904. The Kelly-Springfield Tire Company also used women in their advertisements even though they were selling tires for a horse-buggy outfit. (Life, September 3, 1903).

²³⁰ Collier's, 1908.

²³¹ Phebe Westcott Humphreys, "An Automobile Vacation on \$1.60 a Day," The Ladies Home Journal, July 1906, 27.

²³² A. Sherman Hitchcock, "Women as Drivers of Automobiles," The Automobile, April 19, 1906, 674.

uncommon in 1906 to see a large touring car filled with women driving in congested business districts and on city boulevards.²³³ Four women made a transcontinental trip in a Maxwell car in 1909, performing all the necessary repairs themselves along the way.²³⁴ By this time, a column written especially for women drivers dispensed advice on many aspects of driving, including how to handle emergencies and avoid accidents.²³⁵ Was ease of use, then, specifically aimed at women?

While Scharff acknowledges that a few gasoline auto manufacturers recognized a female market for their products,²³⁶ she generally provides the impression that the majority of the manufacturers did not specifically target women drivers for their larger gasoline touring cars. Scharff claims that the rapidly growing number of women driving gasoline cars disrupted the gendered stereotype in the minds of the advertisers who saw electric cars as *the* car for women and gasoline cars as the car for men.²³⁷

However, advertisements depicted women at the helms of gasoline cars as early as 1902 (Figure 2.28). The emphasis on the ease of operating gasoline cars at this early stage confirms the idea that manufacturers would sell a car to anyone, regardless of gender, who could afford it. Indeed, whether manufacturers were catering to the needs of women or whether they were specifically targeting them as potential buyers could be argued in a number of different ways, but one thing is certain: manufacturers had women foremost in their minds from the start (Figures 2.28 through 2.37).

²³³ “Auto Women Shoppers,” *The Automobile*, May 3, 1906, 734.

²³⁴ A. R. Ramsay, “Four Women and an Auto,” *The Automobile*, June 24, 1909, 1044.

²³⁵ A. Sherman Hitchcock, “Woman at the Wheel,” *The Automobile*, May 6, 1906, 753.

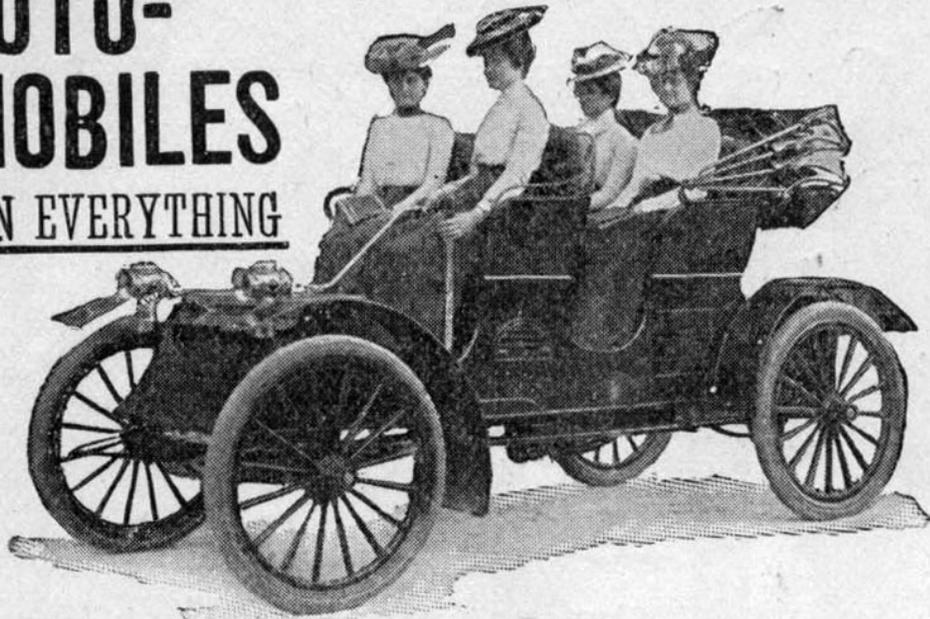
²³⁶ Scharff, *Taking the Wheel*, 46–47.

²³⁷ Scharff, *Taking the Wheel*, 37.

HAYNES-APPERSON AUTO- MOBILES

WIN EVERYTHING

Results
Count



Two Machines entered.

Two Machines receive first certificate.

Two Machines make higher average than any other machines made in America—our record in New York and Buffalo endurance test.

First Prize Long Island endurance test, **100 miles without a stop.**

First Prize Cup Five-Mile speed contest, Fort Erie track, Buffalo, N. Y.

First Prize Cup Ten-Mile speed contest, Point Grasse track, Detroit, Mich.

Gold Medal Pan-American Exposition.

Every machine we have ever entered in any contest has won first place. No failure mars our record. We believe this is not true of any other make in the world. Write for catalogue describing our two and four passenger vehicle.

The HAYNES-APPERSON CO., Kokomo, Ind., U. S. A.

Figure 2.28. Haynes-Apperson Advertisement, *Life*, March 6, 1902, 182.

I have had no trouble learning to operate my new Peerless Touring Car, and it runs beautifully—no trouble, no care—just real satisfaction.
Mrs. C. Harry Tobey,
 4837 Kenwood Ave., Chicago.

PEERLESS TOURING CAR
 The universal acceptance of the Peerless Car as standard of American manufacture is not due to whim or fad of automobile purchasers, but to realization on the part of students of automobiles that the results attained by the Peerless show conclusively ideal arrangements of parts coupled with care in manufacture.

A Few of "The Ideals."—Vertical motors, two or four cylinder, under front bonnet. Direct drive by universal shaft and bevel gears. High horse-power—regulated motor. 34-inch wheels—long wheel base. Large comfortable tonneau—magnificent finish.

If you don't understand some of the above technical terms, ask some one who does. He'll tell you they mean "Best" in automobile construction.

Peerless by Name—Peerless in Appearance—Peerless in Action
PEERLESS MOTOR CAR CO. Cleveland, Ohio

Figure 2.29. Peerless Advertisement, Life, August 6, 1903, 119.



“Rides Like a Pullman”

“I think the Searchmont is undoubtedly the easiest-riding automobile built to-day. It rides like a Pullman. You have certainly struck the key-note. I think you are building the best car on the market, regardless of price.”

The rare smoothness and luxuriousness of

The **Searchmont** \$2500

is due, not only to the splendid type of motor and transmission, which do their work with the least possible jar, and to the comfortable, roomy body of the car, but particularly to the superbly fine adjustment of part to part.

This also is the secret of its reliability.

This thought is suggested to us by the above letter recently received from a **Searchmont** owner. We get letters like this almost every day.

Send for catalogue of

“America’s Leading Automobile”

NEW YORK, John Wanamaker
 PHILADELPHIA, John Wanamaker
 BOSTON, H. B. Shattuck & Son
 PROVIDENCE, H. B. Shattuck & Son
 CHICAGO, Githens Bros. Co.
 NEWARK, Automobile Co. of N. J.

PITTSBURG, A. P. Shumaker
 CLEVELAND, Cleveland Auto. & Supply Co.
 DETROIT, W. H. Weber
 WASHINGTON, Chas. E. Miller & Bro.
 BALTIMORE, Mar-Del Mobile Co.

MILWAUKEE, Jonas Automobile Co.
 ST. LOUIS, Mississippi Valley Auto. Co.
 CINCINNATI, Special Motor Vehicle Co.
 ROCHESTER, Rochester Automobile Co.
 MINNEAPOLIS, A. F. Crase & Co.

SEARCHMONT AUTOMOBILE CO., North American Building, Philadelphia
 Factories: Searchmont (near Chester) Pa.

Figure 2.30. Searchmont Advertisement, Life, July 23, 1903, 93.



The Cudell

12 H. P. 2 Cylinder Touring Car, Royal Standard Body or King of Belgium Body; four speeds and reverse, direct drive; starts from the seat.

18 H. P. 4 Cylinder Touring Car, Royal Standard or King of Belgium Body; four speeds and reverse, direct drive.

25 H. P. 4 Cylinder double chain drive. Mercedes water cooler; four forward speeds and reverse, direct drive.

Bevel Gear or Chain Drive Used as Ordered
Delivery in 10 days. Free Tuition. One Year's Guarantee

J. C. BRANDES, U. S. Agent

28 W 33d Street, New York

Reliable Agents Wanted

Telephone, 2754 Madison.

Figure 2.31. Cudell Advertisement, *Life*, June 4, 1903, 505.

FRANKLIN

Four-cylinder
Air-cooled
Motor

“The
Motor-car
of the
Future”

**Franklin
Motor-Cars**

are as strong as a giant and as sensitive and
spirited as a thoroughbred horse.

The knowledge that has enabled us to get rid of the unnecessary, heavy, and troublesome water-cooling system, has also enabled us to construct a motor of extreme effectiveness; to make a carburetor, and to invent a system of control, that produce a flexibility and ease of management not heretofore dreamed of; to save weight, complication, and repairs, in the transmission; and, in every part, to get the utmost effectiveness with the least machinery.

The **Franklin Light Car** is the most efficient light car in the world. The **Franklin Light Tonneau** (holding four) is, so far as we know, the only perfectly satisfactory car that is built for either two or four. The **Franklin 24 H. P. Touring Car** (seating five) is extremely luxurious.

Send for catalogue—a fair and clear book.

H. H. Franklin Mfg. Co., 311 Geddes St., Syracuse, N. Y.
Member Association Licensed Automobile Manufacturers

Figure 2.32. Franklin Advertisement, Life, May 5, 1904, 419.

STUDEBAKER



“THE AUTOMOBILE WITH A REPUTATION BEHIND IT.”

WITH an eye to long-continued usefulness, the careful purchaser will appreciate the value of Studebaker design, materials and workmanship. Even were other considerations equal, the comfort, elegance and DURABILITY of Studebaker Automobiles guarantee unequaled satisfaction. Our agents will gladly give further particulars, or catalogues will be sent on request.

THE STUDEBAKER ELECTRIC CAR

has been thoroughly tested by actual use, and the fact that we are constantly receiving orders to duplicate shipments proves that it is eminently satisfactory as a convenient, easily-run automobile for local use. Equipped with Edison or Exide batteries and made in a variety of types.

NEW YORK CITY: Broadway, corner 48th Street.
CHICAGO, ILL.: 378-388 Wabash Avenue.
KANSAS CITY, MO.: 810-814 Walnut Street.
SAN FRANCISCO, CAL.: Corner Market and 10th Streets.

THE STUDEBAKER GASOLENE TOURING CAR

is designed for long-distance touring. It is a light, noiseless and powerful car, which incorporates the most modern improvements. Made by a concern whose name is a synonym for reliability, and sold at a price which makes it an unusually profitable purchase.

PORTLAND, ORE.: 330-334 East Morrison Street.
DENVER, COL.: Corner 15th and Blake Streets.
SALT LAKE CITY, UTAH: 157-159 State Street.
DALLAS, TEX.: 317-319 Elm Street.

AGENCIES IN OTHER PRINCIPAL CITIES.

AUTOMOBILES

Figure 2.33. Studebaker Advertisement, *Life*, June 2, 1904, 560.

The Studebaker

"THE AUTOMOBILE WITH A REPUTATION BEHIND IT."

Unsolicited testimonials from owners of

The Studebaker Electric Car

prove that it satisfies the increasing demand for a horseless vehicle which can be conveniently run for local use. It is equipped with Exide or Edison batteries, and made in the following models: Runabout, Victoria-Phaeton, Stanhope, Surrey or Delivery Wagon and Trucks.

The Studebaker Gasoline Tonneau Car

is designed for those who appreciate a light, noiseless and powerful car of the most approved type—sold at a fair price. Write for catalogue to

**STUDEBAKER AUTOMOBILE CO.,
SOUTH BEND, IND.**

BRANCH HOUSES:

NEW YORK CITY: Broadway, corner 48th Street.	PORTLAND, ORE: 330-334 East Morrison Street.
CHICAGO, ILL.: 378-388 Wabash Avenue.	DENVER, COL.: Corner 15th and Blake Streets.
KANSAS CITY, MO.: 810-814 Walnut Street.	SALT LAKE CITY, UTAH: 157-159 State Street.
SAN FRANCISCO, CAL.: Cor. Market and 10th Sts.	DALLAS, TEX.: 317-319 Elm Street.

AGENCIES IN OTHER PRINCIPAL CITIES.

Figure 2.34. Studebaker Advertisement, *Life*, May 5, 1904, 446.

Locomobile.

"EASILY THE BEST BUILT CAR IN AMERICA"

Locomobile Gasolene Cars

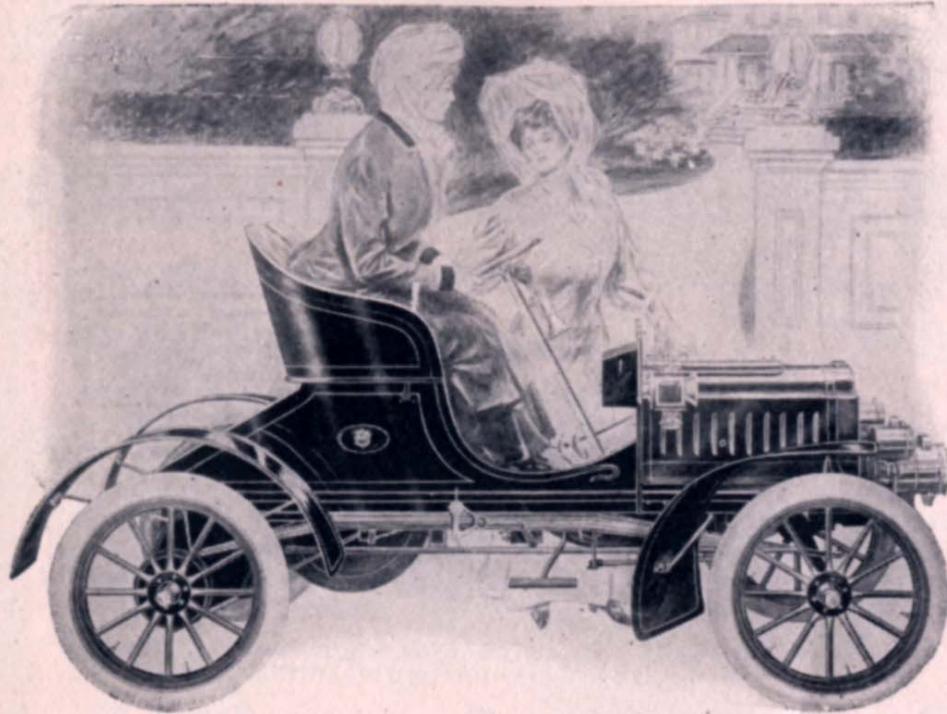
are not only equal in all respects to the best foreign cars, but are a *great deal better for American roads.* There are many reasons for the superiority of LOCOMOBILE Cars, but little room here to state them. What we want you to do is to send for our catalogue. It is not a rambling mass of generalizations but a book of facts and figures. Our catalogue tells you *why* the LOCOMOBILE is better than any other car in the world. Mailed free.

1905 MODELS. ALL 4-CYLINDER SIDE-ENTRANCE CARS.

15-20 H. P. Price, \$2,800. Weight, 1,800 lbs. Make-and-break ignition. Pressed steel frame.	20-25 H. P. Price, \$3,700. Weight 2,300 lbs. Jump spark ignition. Channel steel frame.	30-35 H. P. Price, \$5,000. Weight, 2,700 lbs. Make-and-break ignition. Pressed steel frame.	40-45 H. P. Price, \$7,500. Weight, 3,000 lbs. Make-and-break ignition. Pressed steel frame.
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The Locomobile Company of America, Bridgeport, Conn.
 NEW YORK, Broadway and 76th St. Member Association of Licensed Automobile Manufacturers.
 PHILADELPHIA, 249 N. Broad St. BOSTON, 15 Berkeley St.
 CHICAGO, 1354 Michigan Ave.

Figure 2.35. Locomobile Advertisement, McClure's, April 1905, 75.



Makes everyone your neighbor—the

OLDSMOBILE

has endeared itself to the feminine heart just as it has established itself in the business world, by the universality of its merit. Its ease of control and freedom from getting out of order make every woman its friend. John Lothrop Motley said, "Give us the luxuries of life, and we will dispense with its necessities"—the *Oldsmobile* is both.

Standard Runabout, \$650

Touring Runabout, \$750

Light Tonneau Car, \$950

Touring Car, . . . \$1400

All prices f. o. b. factory. Send 10c. for six month's trial subscription to Motor Talk, a magazine devoted to automobile interests. Address Dept. J.

OLDS MOTOR WORKS Detroit, U. S. A.

Member of Association of Licensed Automobile Manufacturers.

Figure 2.36. Oldsmobile Advertisement, *Life*, April 6, 1905, 360.



**Close
To a
Woman's
Heart**



It is important in selecting an Automobile that you take into consideration the women of your family. If your selection is a

POPE
Waverley
ELECTRIC

Any member of the household can operate it. These carriages are always ready, noiseless, clean, stylish and dependable.

Model 36 illustrated above, price \$900, with top \$950, is an ideal carriage for general purposes, the early morning spin, the station, theatre, shopping or calling. Very popular with physicians.

**Be sure the name "POPE" is on
your Automobile.**

We make 15 distinct models at prices from \$850 to \$2,250. Runabouts, Stanhopes, Surreys, Chelseas, Physicians' Road, Station, and Delivery Wagons. Electric Trucks on specifications.

POPE MOTOR CAR COMPANY
Desk 5, Indianapolis, Ind.

Boston, Mass., 223 Columbus Avenue
Washington, D. C., 819 14th Street N. W.
New York City, N. Y., 1733 Broadway
San Francisco, Cal., 451 Mission Street

Figure 2.37. Pope-Waverly Advertisement, Ladies Home Journal, July 1906, 27.

John W. Haynes, a well-known race car driver, noted in 1907 that women “who learn to drive cars are as a rule exceptionally capable after they have mastered the mechanical details of the work.”²³⁸ Many women automobile workers also helped commercialize cars. It was observed in 1909 that women performed the “better class of work” in almost every automobile plant, particularly for tops and upholstery work.²³⁹ The notion of the car as being “born out of a masculine manger,” as Scharff argues,²⁴⁰ may require further clarification, particularly when the birth of the automobile appears to be intimately tied to the patronage of women as buyers and as factory workers.

Although there is little accurate data on the number of drivers, in general, in the first decade of the twentieth century,²⁴¹ female motorists certainly were featured in many accounts of motoring. A noted automobile observer in Buffalo, New York, noticed that women drove to the shopping district in their own cars, paying no heed to the cold or snow, whereas three or four years earlier, no one, including men, had dared to drive in Buffalo’s winter weather.²⁴² As early as 1903, women in many cities, such as Pittsburgh, demanded a separate motor school and instructors of their own.²⁴³ At this time, the Ladies’ Automobile Club of Great Britain and Ireland secured a large drawing room in the Hans Crescent Hotel for six months reserved exclusively for lectures and practical lessons in motorcar driving.²⁴⁴ The cover of the Automobile Club of America’s annual banquet menu card in 1903 featured a picture of a woman driving an automobile.²⁴⁵ Life magazine in 1902 began publishing advertisements for automobiles featuring women as passengers and drivers.

²³⁸ “Considers Women Most Careful Drivers,” The Automobile, September 5, 1907, 332.

²³⁹ “Female Labor is Now Being Utilized,” The Automobile, December 30, 1909, 27.

²⁴⁰ Scharff, Taking the Wheel, 13.

²⁴¹ “Motor Car Law,” Motor, June 1909, 40–45. Also Scharff, Taking the Wheel, 25.

²⁴² “Says Autos Are Replacing Sleighs,” The Automobile, February 13, 1908, 220.

²⁴³ “Motor Life Stirring In the Iron City,” The Automobile, December 5, 1903, 589.

²⁴⁴ “Club for Women Motorists in England,” The Automobile, October 31, 1903, 1.

²⁴⁵ The Automobile, January 31, 1903, 148.

It is conceivable that manufacturers of electric cars focused specifically on *wealthy* women rather than on women in general. Thus the contrast between electric and gasoline as a gender-driven category, as Scharff²⁴⁶ proposes, could be argued along the lines of economic and class distinctions. However, even the class issue does not seem to provide a neat classificatory scheme for the various types of motors. An Oldsmobile advertisement in Life magazine in 1903, for instance, despite featuring a gasoline car, attempted to appeal to economic prestige by showing how the continuity of upper class distinctions between 1703 and 1903 persisted despite changes in modes of transport (Figure 2.38).²⁴⁷ An almost identical image appeared in Life magazine seven years later, again depicting two wealthy women, one from 1710 and the other from 1910, meeting on common ground despite having arrived in different types of transport.²⁴⁸

Perhaps rather than viewing different types of automobiles as a mechanism for creating different types of gender and class distinctions, one could examine the availability of different price and model options as mirroring pre-existing social structures. Class distinctions in existence during the period of the horse and carriage appeared to have been transplanted into the motor era: specific cars were designed for specific types of buyers.

²⁴⁶ Scharff argues that the popularization of gasoline vehicles came as a result of the incorporation of supposedly feminine frills, such as electric starters in lieu of cranks (Taking the Wheel, 58–59).

²⁴⁷ Life, September 3, 1903.

²⁴⁸ Life, January 6, 1910, 32.

1703

1903

THE CONTRAST OF CENTURIES

A limited area of travel was the natural result of the indifferent methods of locomotion used in the early days of the 18th century. To-day

THE OLDSMOBILE

is everywhere. The pioneer American Automobile has out-distanced competition. It is vastly superior to the next best machine made, as its imitators lack the 23 years' experience we have had in building gasoline engines.

Four years of consistent service is the crowning triumph of the Oldsmobile—the car which is built to run AND DOES IT, with “*Nothing to Watch but the Road.*”

Ask the leading Automobile dealer in your town—our agent—to show you how the Oldsmobile “goes.”

Write for illustrated book to Dept. J.

OLDS MOTOR WORKS
DETROIT, U. S. A.

Members of the Association Licensed Automobile Manufacturers.

Figure 2.38. Oldsmobile Advertisement, Life, September 3, 1903, 210 (inside front cover).

The Automobile magazine’s comprehensive profile of car models available in the market in 1906 showed that the *lowest* price category, from \$400 to \$800, and the

highest price category, from \$6,500 to \$12,300, consisted of gasoline cars.²⁴⁹ That gasoline cars dominated both ends of the price spectrum, from most affordable to most luxurious, indicates the effort of gasoline car manufacturers to appeal to different types of buyers from the beginning, not just to those at the low end of the market. Electric cars competed with gasoline cars within the same price category. During the horse era, some carriages were built specifically for the upper class, but the automobile era also appealed to the same class distinctions regardless of the motor power used. A 1915 Life illustration best exemplifies how the social practice was simply transferred into an automotive medium (Figure 2.39).²⁵⁰

²⁴⁹ The lowest price category includes Orient (\$400); Ford (\$400–\$500); Olds, Reo, Holsman and Northern (\$650); Cadillac, Wolverine, Mitchell, Pierce-Racine, Randall (\$750); Maxwell (\$780); Wayne, Queen, Holsman (\$800); while the *highest* price category consisted of Lozier (\$6,500); Simplex (\$6,750); Napier, Fiat (\$7,000); Matheson, Berliet, Hotchkiss, Martini, Rochet-Schneider, Renault (\$7,500); English Daimler (\$8,000); Züst (\$8,500); Panhard (\$10,000); Mercedes (\$10,900); Fiat (\$12,000); Rochet-Schneider (\$11,000); Panhard (\$12,300). See “Chief Characteristics of 1906 Models,” The Automobile, January 11, 1906, 32–66.

²⁵⁰ Life, May 13, 1915, 8.

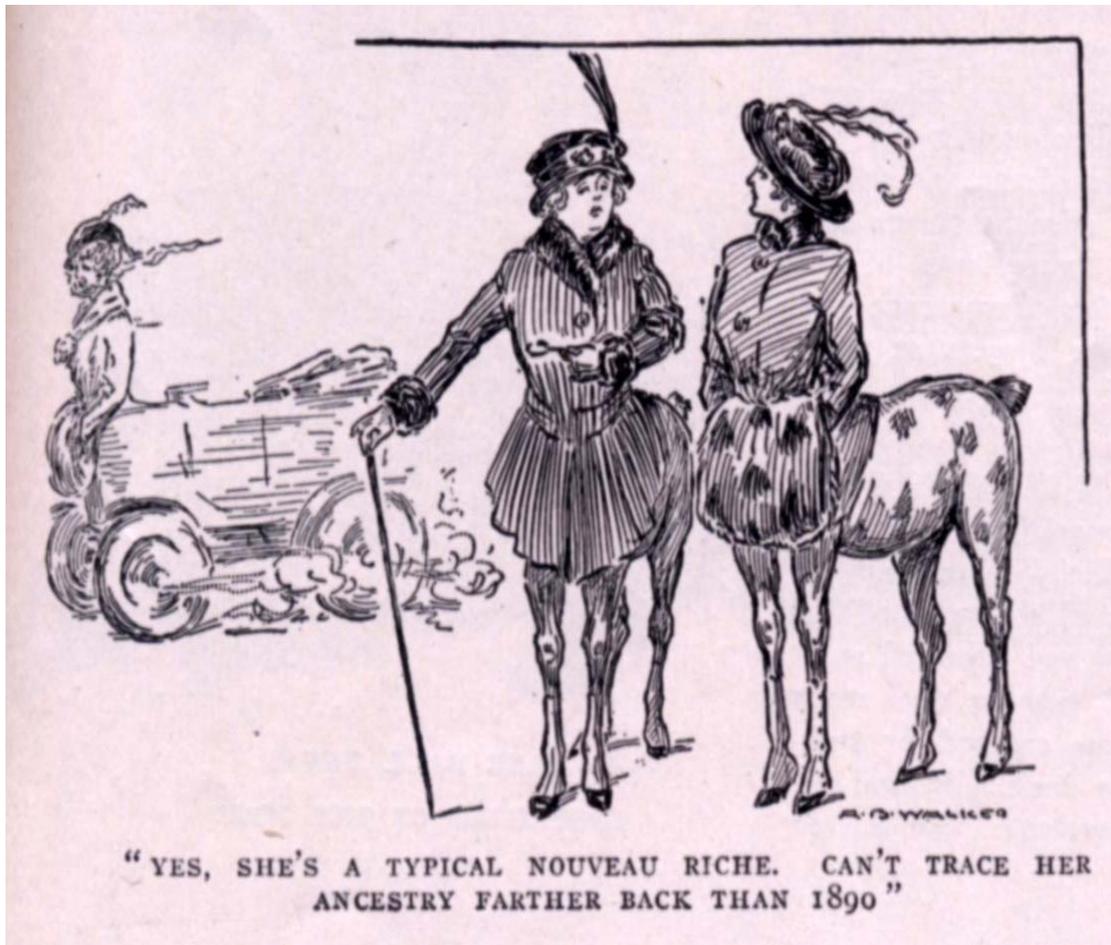


Figure 2.39. Illustration, Life, May 13, 1915, 861.

Nearly all automobile builders at that time admitted to studying idiosyncrasies in fashion, particularly with regard to color, in order to effectively harmonize or contrast cars with women's dresses.²⁵¹ A company that made one of America's costliest cars sold two machines at a private exhibition to two women buyers who bought the cars simply on the basis of their being the right color to match their wardrobes.²⁵² Many socialites had their cars repainted on a regular basis to match their gowns.²⁵³

²⁵¹ "Casual Cut-outs," Dress and Vanity Fair, October 1913, 108.

²⁵² Ibid.

²⁵³ Ibid.

Supplanting the Horse

The transplantation of social practices onto the automotive platform occurred as manufacturers sought to redefine the monstrous as the mundane. While early advertisements may have adopted persuasive measures to convert early horse and buggy users, early adopters themselves informed advertisers in various creative ways to make this transition work. For instance, as early as 1896, for a Horseless Carriage Race conducted on the horse race track in Narragansett Park at the Rhode Island State Fair, all drivers wore jockey outfits of derby shirts and hats rather than goggles and hoods.²⁵⁴ The sport of foxhunting in Nashville, Tennessee, had been greatly facilitated by the use of the automobile in 1905 because it decreased travel time to and from the hunting grounds.²⁵⁵ Seven years later, the actual hunt itself in England was described to have been “revolutionized” by the replacement of horses with automobiles,²⁵⁶ although horses remain a part of the hunting tradition of the elite gentry in England today.

A telling Life magazine cartoon, captioned “Will the horse be superseded by the automobile in every equestrian sport?” featured a woman behind the wheel controlling a series of cars harnessed together like horses (Figure 2.40).

²⁵⁴ M. Worth Colwell, “America’s First Track Race,” The Horseless Age, February 1, 1911, 273.

²⁵⁵ “Fox Hunting With An Automobile,” The Automobile, November 30, 1905, 1.

²⁵⁶ Victor Hart, “Hunting by Automobile in England,” The Horseless Age, February 28, 1912, 1.

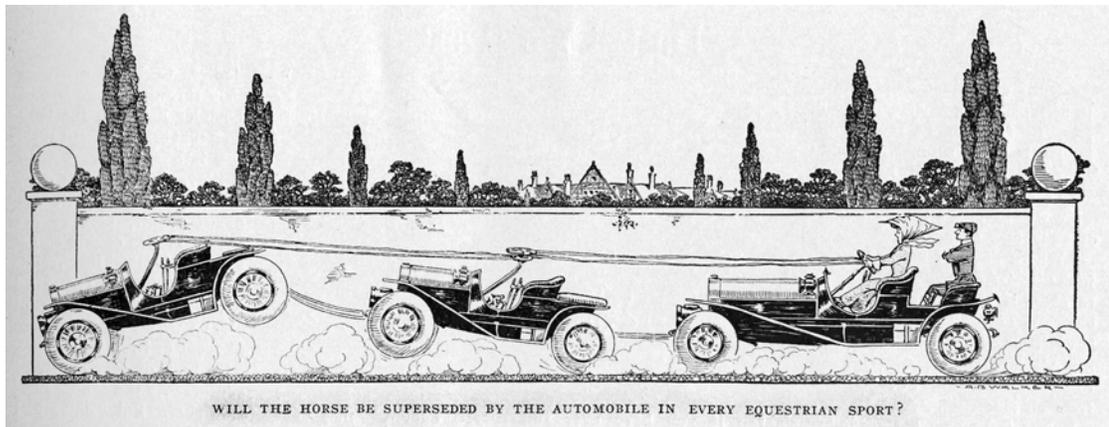


Figure 2.40. Illustration, Life, January 7, 1909, 23.

Almost thirty years later, the same analogy of automobiles replacing racehorses was suggested by a Kelly automobile advertisement. The advertisement showed a man standing beside a car and a woman sitting behind the wheel: “Got any tips, Tommy?” asks the woman. “Well, they say Kelly is a good bet in the third race,” replies the man. The woman answers, “That sounds good to me. I’d bet on a Kelly any time.”²⁵⁷ Thus there were cases when suggestions of a direct replacement of the horse were made without any modifications of practices. Perhaps a more telling example of the enduring character of preexisting practices is the picture of a woman in The Automobile magazine in 1902, in which her spinning wheel was replaced by a driving wheel, with the caption, “the more things change, the more they stay the same” (Figure 5.1)²⁵⁸

Tales of courtship with lovers eloping via automobile instead of horse were a common theme. For instance, an illustrated story of a father running after his daughter showed young lovers escaping in an automobile while the father tried to catch up with his horse-drawn carriage.²⁵⁹ Some stories used “then” versus “now” pictures showing lovers running away in a horse-drawn carriage with Cupid in the background pointing

²⁵⁷ Saturday Evening Post, June 30, 1923, 65.

²⁵⁸ Automobile Magazine, July 1902, 587.

²⁵⁹ Collier’s, July 4, 1908, 6.

his arrow at the lovers (“then”) only to be replaced with an automobile (“now”) with Cupid chasing after them on a bicycle.²⁶⁰ Another illustration of this type of past-present scenario included that of a horse tied outside the house of a lady being courted (“then”) replaced with a car parked outside the same house (“now”).

These then-versus-now illustrations suggest that nothing much had changed except for the direct replacement of the horse with the automobile and the obvious difference in speed. These reassuring images of familiar circumstances surrounding a new and increasingly proliferating technological device could perhaps be taken as a cynical social commentary on the inability of social order to change with the times. Nevertheless, the emphasis on continuity of practices associated with the horse in advertisements and social commentaries assures the consistency of the message given to the public—using an automobile would not radically change people’s lives.

Suggestions of automobiles supplanting horses were also depicted in traditional folklore stories. For example, an illustration of Lady Godiva riding in an automobile rather than on a horse (“Had Lady Godiva Lived To-day”)²⁶¹ attests to the many ways in which horses were physically supplanted by automobiles, although not in conceptual and functional terms. In more practical matters, street sprinklers, ambulances, and fire trucks were motorized in the first decade of the twentieth century in place of animal horse-power. The general appearance of these public service vehicles has been described as closely resembling their equivalent horse-drawn prototypes, with the motor doing the work of the horse.²⁶² American Indians, or “aboriginal Americans” as they were called in the early days, were said to have caught the motor craze as well, with a description in the cover article of The Automobile magazine claiming that the “noble red man seems to have [taken] very kindly to the

²⁶⁰ Life, February 4, 1909, 163.

²⁶¹ Life, September 13, 1906, 281. Also, a similar illustration with the same caption appeared in Life, September 17, 1914.

²⁶² “An Automobile Aid to Good Roads,” The Automobile, April 8, 1905, 1.

automobile” and that a number of them owned and operated their own machines on the reservations.²⁶³ A comic strip of 1909 depicted a cowboy riding an automobile much like a horse in pursuit of a cow (Figure 2.41).²⁶⁴

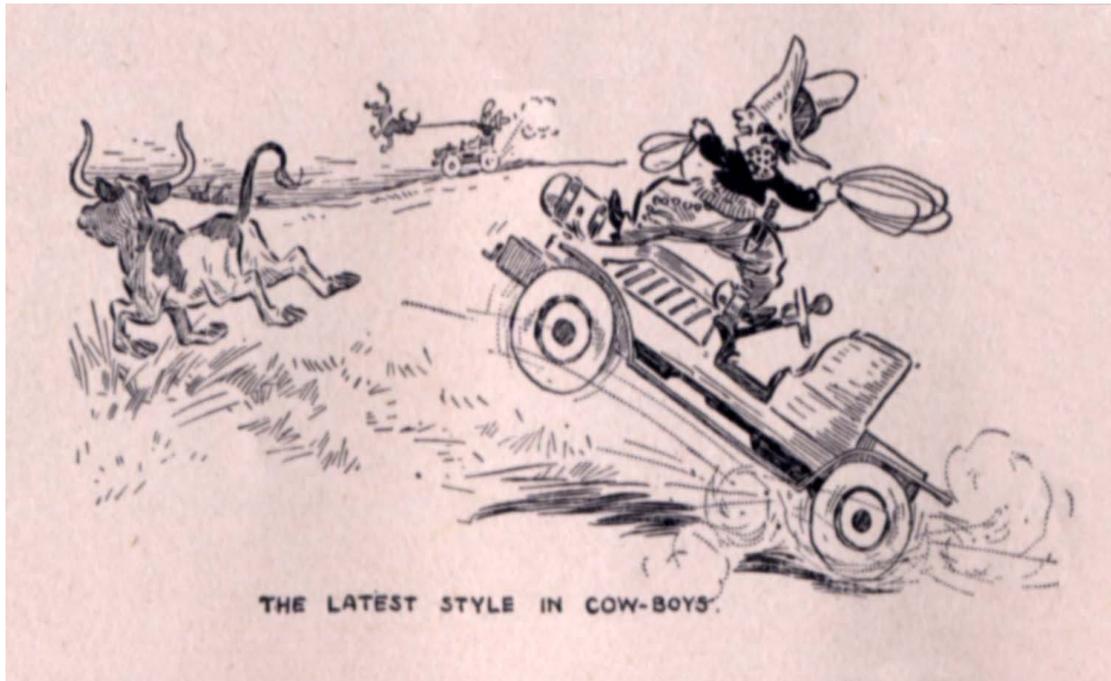


Figure 2.41. Illustration, Life, March 4, 1909, 287.

California ranchers were described as using motorcars to ride up to “snow peaks and down to desert valleys below the level of the sea,” as one observer claimed, for automobiles were supposedly as common as horses in sparsely populated areas of the cattle country of the west from as early as the first decade of the twentieth century.²⁶⁵ These later examples again show the increasing trend toward replacing the horse physically but maintaining its functional and conceptual use.

The automobile also made use of pre-existing distribution and service infrastructures built around the servicing of the horse. Commercial supply routes in

²⁶³ “Poor Lo Takes An Automobile Outing,” The Automobile, May 18, 1905, 1.

²⁶⁴ Life, March 4, 1909, 287.

²⁶⁵ John S. McGroarty, “The Valley of Surprise,” The West Coast Magazine, June 1911, 266–267.

urban areas relied on the use of horses for the distribution of goods and services. According to McShane and Tarr, the entire internal city circulatory system at the turn of the twentieth century, such as freight delivery, passenger transportation, food distribution, and police and ambulance services, was constructed around the horse.²⁶⁶

Many carriage companies such as Pritchard, Edwards and Sullivan²⁶⁷ in 1890 began selling horseless carriages side by side with buggies in their stores; this continued into the early twentieth century. The established firm of Fiss, Doerr & Carroll Horse Company of New York City took on the exclusive distributorship of Columbia electric vehicles.²⁶⁸ The Studebaker Carriage Company advertised automobiles and horse carriages side by side in many of its posters.²⁶⁹ Sales barns for horses were used to exhibit automobiles.²⁷⁰ Secondhand cars were sold on horse auction blocks.²⁷¹ Storage facilities were referred to as “automobile stables” rather than garages.²⁷² Terms such as a “stable full of cars” used in many Oldsmobile and Herreshoff advertisements continued to appear as late as 1909. Shifting the infrastructure of carriages to cars occurred with ease and without massive start-up costs.

While horses had been argued to be a “liability” compared to automobiles, particularly in terms of daily operation and maintenance for public transport,²⁷³ the rapid diffusion of the automobile appears to have been facilitated by the ease with which it inserted itself into well-established infrastructures from horse culture such as

²⁶⁶ McShane and Tarr, “The Centrality of the Horse,” 106.

²⁶⁷ Currently, the company is called William T. Pritchard Inc. of Ithaca, NY. The business has operated for five generations (115 years), beginning with James G. Pritchard in 1890.

²⁶⁸ “Horse Firm Takes Auto Agency,” The Automobile, April 1, 1909, 557.

²⁶⁹ McClure’s Magazine, and Life advertisements, 1905.

²⁷⁰ “Automobiles Again Displace Horses,” The Horseless Age, April 10, 1912, 657.

²⁷¹ “Autos Sold Before the Horse Block,” The Automobile, May 31, 1906, 879.

²⁷² “The Private Automobile Stable,” The Automobile and Weekly Motor Review, July 5, 1902, 1. Also, advertisements for Woods Motor Vehicle, July 7, 1900, 29; advertisements of the Herreshoff Cars, Collier’s, January 16, 1909, 10.

²⁷³ Flink, The Automobile Age, 135–140. Also, see p. 442 where author indexed horses in terms of liabilities only (Horse-liabilities of the) without a corresponding discussion of assets.

distribution and sales systems, service and maintenance centers, and even cultural infrastructure such as reasons for using a transport vehicle. In positioning itself to work like a horse, the automobile did not have to challenge the existing work structure directly in order to find its way into people's lives. It merely had to supplant the horse.

Conclusion

The momentum gained in shifting from muscle to motor power required measures of forced likeness to be made between the automobile and the horse. Motorized power posing as muscle power came as a move to pull the automobile from the periphery to the very center of society—automobile manufacturers employed various means to project an image of a reliable, easy-to-operate, mundane, practical everyday transport in order to overcome an infamous reputation of technical novelty with dubious functionality. Early automotive advertisements provide interesting insights into how this was accomplished.

During the first decade of the century, automotive advertisements had to contend with uncertainties regarding the viability of a self-propelling vehicle and its ability to deliver benefits not already being provided by the horse. The automobile had to shed its whimsical and sporting past in order to be accepted as everyday transport. Despite its significant differences from the horse in terms of driving, operational controls, and, for that matter, sights, smells, and sounds, the automobile was presented as the horse's operational (motorcar steering working like reins) and functional (working just like a horse) equivalent. As a writer observed in 1905, there was "in automobile affairs the constantly recurring allusion to the work of horse-drawn vehicles."²⁷⁴

In becoming like a horse, the automobile justified its purpose as a useful device. At the same time, in becoming unlike the horse—a cheaper and better

²⁷⁴ "Automobiles vs. Horse-drawn Vehicles," The Automobile, August 10, 1905, 172.

alternative—it justified itself as a replacement. An interesting paradox transpired in many advertisements to promote the motorcar. Horses were supposed to be inferior, needing to be replaced with machines—machines that worked just like a horse, only better. Hence, the intentional effort to align the automobile with horse culture raises the question of technical superiority and economic sensibility as the sole determinants of automotive diffusion. I argue that by virtue of its association with the horse, the automobile was transformed from a deviant spectacle into a commonplace device of everyday life. The automobile, loathed by the public, came to assume an image of familiarity and conformity.

The transformation of the automobile to a mode of familiar everyday transport also came to be understood in terms of feminine articulations. Women constituted the “first paying” customers who insisted on a machine that was clean, speedy, and reliable.²⁷⁵ The use of women in early automotive advertisements showed their importance as patrons and had the added benefit of conveying an image of safety, comfort, and ease of use to a cantankerous machine. Feminine descriptors intertwined with equine features helped enhance the automobile’s reputation as a replacement for the horse-drawn carriage. Automotive manufacturers hired carriage mechanics and builders to create a more coach-like automobile, emphasizing comfortable ride over exhilarating drive, bringing in another element of familiarity to mainstream commuters. Traditional names and designs of horse-drawn carriages were copied.

The need for motor power to be interchangeable with muscle power may appear to have emerged seamlessly from the strength of pre-existing practices rooted in the horse culture. However, it also appears that this transition was initially facilitated by manufacturers who expressed this intention through advertising. Automobile advertisements borrowed heavily from preexisting social norms

²⁷⁵ Henri Dumay, “The Locomotion of the Future,” *Collier’s*, July 30, 1898, 22.

concerning the various uses of the horse to deliberately redirect consumer orientation from literal horse power to figurative horsepower. The horselessness of the motorcar, its novel aspect, was less emphasized. Rather, the motorcar was simply introduced as a functional equivalent of the horse without its organic limitations. The motorcar co-opted pre-existing equine culture and practices in order to survive, particularly in its early, and most precarious, stage of development.

Automotive ubiquity did not occur simply because cars became much more affordable and cleaner and performed more efficiently than horses. Historical studies generally have not discussed how the automobile relied upon society's long-standing working relationship with the horse in order to be understood and accepted. When cars began to be seen as functioning like horses, rapid diffusion ensued as socioeconomic and cultural practices built around the horse were transferred to the car.

In the next chapter, I will show how this recurring dependency of the motorcar on equine culture persisted even in military settings. In an attempt to motorize the cavalry, the military was caught in a similar predicament of having to preserve its long-held tradition of speed and mobility on the battlefield, which had been carried out using the horse. At the same time, there was urgent pressure to motorize, and a battle ensued between the proponents of the horse and the proponents of the motorcar.

While the motorcar appeared to have gained some military support from a policy standpoint after WWI, the actual transition to motorization was far from straightforward and, in fact, faltered despite direct mandates from those in high military offices. Reconciliation occurred when specifications for a reconnaissance car followed the performance requirements of the horse, paving the way for the most popular vehicle in World War II, the jeep. However, this reconciliation came about at a slow and arduous pace.

Chapter Three

Case Two: “Breeding” the Jeep: The Conceptualization and Diffusion of the Iron Warhorse

As the automobile began to appear in public streets at the turn of the century, the US Army began to explore various military applications of the newfangled machine.¹ Despite many years of experimentation and numerous attempts to motorize,² more than forty years elapsed before the army transitioned from muscle to motor power on an organization-wide scale. The US military continued using the horse during the interwar years despite its ineffectiveness in WWI. The US cavalry in particular fought fiercely to maintain the use of the horse well into the early 1940s despite significant pressures from high-level military offices to motorize. How was it possible that the motorcar diffused in such a hostile environment?

This second case examines how the military group most adherent to muscle power—the cavalry—became motorized. Similar to the early years of the horseless carriage in civilian society, the motorcar was peripheral to the cavalry world and, to some extent, to the army. The horse, on the other hand, was central to the social culture of the US army.³ To even mention motorcars, at one point during the 1920s, was considered sacrilegious by many high-ranking cavalry officers. The horse was considered to be the chief weapon of the cavalry.⁴ How did the military group most

¹ Norman Miller Cary Jr., “The Use of the Motor Vehicle in the United States Army, 1899–1939,” (PhD diss, University of Georgia, 1980), 5.

² The War Department in 1928 defined motorization as the replacement of animal transport with motor vehicles (David E. Johnson, Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917–1945, Cornell Studies in Security Affairs [Ithaca, NY: Cornell University Press, 1998], 98).

³ Johnson, Fast Tanks and Heavy Bombers, 125.

⁴ Cavalry Service Regulations, 1914 (Washington, DC: GPO, 1914), 9.

opposed to motorization, just as farmers were to the horseless carriage, conceptualize a substitute for the horse after years of protecting it from obsolescence?

The Cavalry Journal, an internal military publication, provides a good source for understanding the entrenchment of horse culture in the cavalry and the role that that culture played in impeding—and eventually facilitating—the change to motorization. The Cavalry Journal, 1920–1946, with a circulation of about 1,500–2,000,⁵ provided a forum for various ranking army officers to voice their opinions on matters concerning the cavalry. The bias of the Journal's articles toward the horse sheds light on the various rationales given for opposing motorization. In general, the qualities of the horse were the same qualities argued to be lacking in the motorcar.

This study also relies heavily upon the 1914 Cavalry Service Regulations issued to all cavalry regiments at a time when principles of leadership had been inculcated in cavalymen for many years. The same principles of leading also appeared in the new drill and service regulations manual of 1916.⁶ It appears that no other succeeding cavalry manuals of these kinds were widely circulated. The 1914 Cavalry Service Regulations manual was issued immediately after a re-organization in the cavalry in which the detached troops of enlisted cavalymen who volunteered as

⁵ American Newspaper Annual and Directory (Philadelphia, PA: N. W. Ayer & Son, 1924, 1930, 1935). Also, Union List of Serials in Libraries of the United States and Canada, Third Edition, Volume 1, A-B, ed. Edna Titus Brown, under the sponsorship of the Joint Committee on the Union List of Serials, with the cooperation of the Library of Congress (New York: H. W. Wilson Co., 1965). The Union List of Serials traces the origins of the Cavalry Journal to the Armor, which began publication in 1888. Then the journal suspended publication from January 1900 to June 1902, and then again from July 1918 to January 1920. From April 1920 to June 1946, the Cavalry Journal was published. Then from July/August 1946 through May/June 1950 the journal was published under the name “Armored Cavalry Journal” (Union List of Serials in Libraries of the United States and Canada, 485). The circulation of the Cavalry Journal during its initial years of publication was approximately 2,000 (American Newspaper Annual and Directory, 158), but it seems to have gradually decreased through the years. In 1930, the circulation decreased to 1,600 (American Newspaper Annual and Directory, 156). In 1935, the Cavalry Journal was published bi-monthly rather than quarterly, but the circulation again decreased to 1,458 (American Newspaper Annual and Directory, 140).

⁶ Mary Lee Stubbs, Stanley Russell Connor, and US Dept. of the Army, Office of Military History, Armor-Cavalry Part I, Army Lineage Series (Washington, DC: GPO, 1969), 32–33.

park rangers at Yellowstone in 1872 were discharged from the Department of the Interior.⁷

Needing to incorporate these volunteers, the cavalry required definitive standards for its operations. It is conceivable that the 1914 manual was intended to provide a unifying role in the cavalry in terms of its fighting principles and practices. Thus, this study uses these manuals as sources for understanding the fundamental principles of their combat culture. The centrality of the horse in these fighting principles provides a backdrop to the heated discourses found in the Cavalry Journal regarding motorization.

The different means used to cope with the pressure to motorize can be gleaned from various articles published in the Journal. One can see from the writings of cavalry members their conflicting sentiments about the motorcar during the interwar period as the organization struggled with the increasing trend toward modernization. The various coping mechanisms employed to maintain equine tradition and cavalry status while remaining true to cavalry missions and principles led to the conceptualization of the jeep.

In addition to exploring the conceptualization of the jeep, this case study also examines the context of use. It looks at how soldiers used jeeps as warhorses to fulfill their combat roles. The work of Virginia Cowles,⁸ who interviewed David Stirling and the SAS group immediately after WWII, provides the major source for an illustration of how the jeep was used in cavalry-style raids. Cowles's work has been the basis for many succeeding historical accounts regarding Stirling. For a more individual level of analysis of soldiers directly relating to their jeeps, the work of Ernie Pyle, a well-known reporter and the first to conduct interviews by "embedding" himself with the

⁷ Ibid.

⁸ Virginia Cowles, The Phantom Major: the Story of David Stirling and His Desert Command (New York: Harper, 1958).

troops, is a major source, as well as Bill Mauldin's poignant images and characterizations of the soldier with his jeep. Other accounts by WWII reporters and soldiers, as well as government documents, manuals, newspaper reports, feature articles, films, political cartoons, and secondary sources are among the other materials used to capture the manner in which the American soldier made the switch from muscle to motor power.

General Overview

After WWI, the United States Congress passed the National Defense Act of 1920 for the purpose of modernizing the army. Congress wanted to investigate why the United States entered the war with a wholly inadequate supply of men, arms, ammunition, and other military equipment, not to mention significant delays in transporting military support to Europe.⁹ This disorganization harked back to a similar predicament at the outbreak of the Civil War in April 1861, when the Union government found itself utterly unprepared.¹⁰ The 1920 Defense Act sought to ensure military procurement and industrial preparedness in the event of another war,¹¹ and thus official doctrines for motorization¹² and mechanization¹³ were created.

During the postwar years of 1919 to 1921, the War Department conducted a battery of tests to determine the feasibility of replacing the horse. The German

⁹ Major-General William Crozier, Ordnance and the World War: A Contribution to the History of American Preparedness (New York: Charles Scribner's Sons, 1920), vii.

¹⁰ A. Howard Meneely, The War Department, 1861: A Study in Mobilization and Administration (New York: Columbia University Press, 1928), 7.

¹¹ Charles R. Shrader, United States Army Logistics, 1775–1992, An Anthology (Washington, DC: Center of Military History, 1997), 457–464.

¹² The War Department in 1931 issued an official definition of motorization and mechanization. Motorization is "the substitution of the motor-propelled vehicle for animal-drawn in the supply echelons of all branches of the Army, and in providing increased strategical mobility for units of all types through the carrying of men, animals and equipment in motor vehicles over roads." Mechanization is defined as "the application of mechanics directly to the combat soldier on the battlefield." See Captain Arthur Wilson, "The Mechanized Force: Its Organization and Present Equipment," The Cavalry Journal 40, no. 165 (May–June 1931): 7.

¹³ Mechanization is the use of motor vehicles for combat.

mechanized attack of WWI forced the army to reexamine its traditional approach to warfare in earnest. Brigadier General George Van Horn Moseley, commander of the 1st Cavalry Division, stated, “When the cowboy down here is herding cattle in a Ford, we must realize that the world has undergone a change.”¹⁴ The motorcar appears to have gained some military support from a policy standpoint, but the horse maintained its paramount position in the cavalry.

Under the 1920 Defense Act, tanks came under the supervision of the United States Infantry because the army believed that tanks would serve as a protection against an attacking enemy.¹⁵ The act essentially attempted to prepare the tank to assume some of the battlefield roles performed by the cavalry.¹⁶ The cavalry served as the protector of other combat arms;¹⁷ thus the idea of tanks serving as a replacement was alarming to the cavalry.

The cavalry’s chief task was to assist other arms of combat. The cavalry tended to maneuver widely and freely because it was in charge of pursuing retreating enemies as well as covering the retreat of its own forces; it was responsible for charging the flank and rear of the enemy, and for delaying the advance of the enemy until the arrival of other arms.¹⁸ Thus it was often situated at a distance from the main body of the army.

The cavalry was also responsible for reconnaissance work, for controlling strategic positions, and for executing all types of raids because these attacks required

¹⁴ Brigadier General George Van Horn Moseley to Maj. Gen H. B. Crosby, December 9, 1927, File 322.02, OCC. Box 12, RG 177, NA, in Johnson, *Fast Tanks and Heavy Bombers*, 125.

¹⁵ *Encyclopedia of American Military History*, vol. 3, P to Z, gen. ed. Spencer C. Tucker, assoc. ed. David Coffey, John C. Fredriksen, and Justin D. Murphy (New York: Facts on File, 2003), 840.

¹⁶ Stubbs and Connor, *Armor-Cavalry Part I*, 49.

¹⁷ *Cavalry Service Regulations, 1914*, 9.

¹⁸ *Ibid.*, 10.

speed and mobility.¹⁹ It was the arm assigned to assist the infantry in filling the gaps in a firing line.²⁰ In essence, the cavalry was the combat arm in the first line of fire.

Despite the cavalry's sacrosanct position in the military,²¹ its value came under fire with modernized warfare. The Cavalry Journal in 1922 described the controversy raging within the cavalry at the time.²² Some groups wanted to embrace motorization, others sought to block any type of change, while still others tried to reconcile the two extremes by incorporating some level of motorization into the cavalry. Disagreements within the cavalry caused such internal upheaval that the organization was engaged in a public relations battle within its own ranks. Many high-ranking cavalry officers sought to preserve the status quo at all costs, and discouraged any discourse that ran contrary to cavalry tradition. Anyone who vaguely entertained the idea of using motorcars was ostracized.

Thus when General Douglas MacArthur, acting as the new Chief of Staff in 1931, attempted again to motorize and mechanize, he was met with a renewed cavalry effort to block motorization. For instance, the cavalry refused to adopt MacArthur's term "mechanized force," instead insisting on the term "mechanized cavalry," which emphasized the precedence of horses over machines. Under MacArthur's directives,²³ mechanization became a responsibility of both the chief of infantry and the cavalry.²⁴ From 1931 to 1940, mechanization developed along two separate lines with two different doctrines, although the so-called infantry fast tank and the cavalry combat car were exactly the same vehicle.²⁵ How, then, was cohabitation of the motorcar and the horse managed under the cavalry leadership?

¹⁹ Ibid., 10.

²⁰ Ibid.

²¹ Johnson, Fast Tanks and Heavy Bombers, 27.

²² Captain Gordon Gordon-Smith, "The Role Played by the Serbian Cavalry in the World War," The Cavalry Journal 31, no. 128 (July 1922): 245.

²³ Encyclopedia of American Military History, vol. 3, P to Z, 840–841.

²⁴ Johnson, Fast Tanks and Heavy Bombers, 117.

²⁵ Ibid., 118. Also in Stubbs and Connor, Armor-Cavalry Part I, 52.

One study argued that although the army intellectually appreciated the capabilities of the motor truck, emotionally its faith and trust remained with the horse.²⁶ The study found that a “feeling” of faith and trust in the horse was apparent in archival records from many years,²⁷ but it failed to cite any examples of how these emotions manifested themselves in a highly militarized environment. The following sections attempt to uncover the foundations of the cavalry’s alliance to the horse and the various means and motivations adopted to defend this alliance in the face of increasing mechanization.

Warhorses and Cavalrymen: Interchangeability in Identity

The bond between the cavalryman and his horse has been described as one of the oldest relationships in war.²⁸ Mounted attacks in the eighteenth century, initially carried out by soldiers who volunteered for the task, became a key strategic weapon of the US Army in many wars during the nineteenth century.²⁹ Mounted rangers were appointed by Congress in 1832 to fight the Indians on the western frontier, forming the first officially recognized cavalry in the regular army.³⁰ The use of horses influenced the pace and design of combat strategies; herein lies the beginning of the long-standing tradition of the cavalry. The horse became inseparable from the act of fighting and from the soldier himself. A 1925 Cavalry Journal article described the relationship as one marked by deep loyalty: “Since civilization began the horse has been the companion, servant and friend of man.”³¹ More than ten years later, even

²⁶ Cary, “The Use of the Motor Vehicle in the United States Army, 1899–1939,” 83.

²⁷ Ibid.

²⁸ R. L. DiNardo, Mechanized Juggernaut or Military Anachronism? Horses and the German Army of World War II, Contributions in Military Studies, Vol. 113 (New York: Greenwood Press, 1991), 79.

²⁹ Gregory J. W. Urwin, The United States Cavalry (Norman: University of Oklahoma Press, 1983), 9–54.

³⁰ Major General William Harding Carter, “Early History of American Cavalry,” The Cavalry Journal 34, no. 138 (January 1925): 7–8.

³¹ Wayne Dinsmore, “What Every Horseman Should Know,” The Cavalry Journal 34, no. 140 (July 1925): 292.

with advances in automotive technology, the horse was still described as “far from being outmoded. Man’s oldest servant of the animal creation is proving to be indispensable to the United States Army.”³²

The image of the cavalryman mounted on a horse charging toward the battlefield typifies a classical picture of a war hero. Without his horse, the cavalryman was just an infantryman. Indeed, cavalrymen were former infantrymen who traveled to the battlefield on horseback. Fighting, at one time, meant dismounting, finding cover, and shooting from the ground.³³ The horse provided the cavalry with the speed and visibility necessary to win wars. The emphasis on mounted attacks provided a psychological rallying point for soldiers to be aggressive and to take the offensive.

The 1914 Cavalry Service Regulations manual reiterated the need to “lean always toward the aggressive; to develop the ‘habit of prompt decision’; and in cases of doubt, to take the boldest decision.”³⁴ Ten years later, it was still a deeply held belief that “without mobility the cavalry [was] of little value.”³⁵ Mobility allowed the cavalry to move across various terrains where the enemy might be hiding to launch attacks. It was believed that only horses could provide such mobility.

The enemy and the terrain were the two elements critical to controlling the battlefield. According to the 1914 manual, “the character of the enemy and the nature of the terrain exercise [were the] controlling influence on the operations of the cavalry.”³⁶ The enemy could be defeated through the boldness and offensive actions of the soldier, while the horse took care of conquering the terrain.

Dismounted actions were strongly discouraged because they hampered rapid, decisive movements. The 1914 manual stated that the “habitual reliance on

³² “Horses and Motors,” *The Cavalry Journal* 45, no. 194 (March–April 1936): 105.

³³ Richard Wormser, *The Yellowlegs* (New York: Doubleday and Company, Inc., 1966), ix.

³⁴ *Cavalry Service Regulations, 1914*, 221–223.

³⁵ Lieutenant Colonel Clarence Lininger, “Mobility, Fire Power, and Shock,” *The Cavalry Journal* 34, no. 139 (April 1925): 178.

³⁶ *Cavalry Service Regulations, 1914*, 222.

dismounted action will weaken and eventually destroy initiative.”³⁷ George S. Patton, an advocate of the mounted cavalry despite its wartime experience with tanks, believed that “success in war depends upon the golden rule [of] war. Speed—Simplicity—Boldness.”³⁸

Horses provided not only speed but also the necessary means for leaders to display boldness with sensational maneuvers and audacity on the battlefield. Leaders must be “active and energetic with a keen eye and good judgment, quick decision and a firm will,” qualities considered essential to seizing control of the battlefield.³⁹ Failure to act decisively constituted a “more serious charge against a cavalry officer” than acting too quickly, with a resulting mistake in operations.⁴⁰

Horses provided the means for cavalymen to be both nimble and aggressive on the battlefield. Without horses, it was difficult for men to deliver surprise offensive attacks that would keep the enemy off-balance. The emphasis on offensive and prompt action was such that the 1926 War Department training regulations for the entire army insisted that only offensive attacks win wars and that every individual in the military must be “imbued with the spirit of the offensive.”⁴¹ This spirit of the offensive was deeply attached to the horse and the mobility it afforded, which may explain the disdain for motorization.

The removal of the horse was seen as akin to a loss of control, and even of a sense of self. It was even believed that the fighting qualities of a good cavalryman could be made manifest only with a continued reliance upon the horse. Without it, the cavalryman’s fighting qualities would atrophy. Thus while the cavalryman depended

³⁷ *Ibid.*, 221.

³⁸ Carlo D’Este, *Patton: A Genius for War* (New York: HarperCollins Publishers, 1995), 306.

³⁹ *Cavalry Service Regulations, 1914*, 223.

⁴⁰ *Ibid.*

⁴¹ Lieutenant W. F. Pride, “Principle of the Offensive,” *The Cavalry Journal* 35, no. 142 (January 1926): 55.

upon the horse for survival and success during wartime, during peacetime he relied upon the horse for the preservation of his fighting skills.

The directors of the Cavalry School believed that long periods of peace may, and often do, impair the efficiency of the cavalryman. There is a mental and a physical, as well [as] a mechanical, rut. Daring and aggressiveness, qualities that are indispensable to the mounted man, may easily be lost. They must be preserved at all odds. Only constant practice, day in and day out, can keep a man a bold and confident rider.⁴²

Such was the dependency of the cavalryman upon his horse that without it, he would become weak, not only physically but also mentally. The horse had been deeply ingrained in the development of the cavalry's skills and abilities such that inherent behavioral qualities, including aggressiveness, depended upon the presence of the horse to be made manifest. Only through the continued use of the horse could the cavalryman exhibit the qualities necessary to defeat his enemy and bring glory to himself and to his unit. Without his horse, the cavalryman became a virtual non-combatant. As late as 1940, a colonel confessed his attachment to his horse:

The true cavalry soldier thinks of his horse's well being before his own—it is his friend and companion in danger; he enjoys going to war as long as he goes on a horse. It is a fact that a man while riding a blood horse, seldom had much fear of death.⁴³

Thus motorization was perceived not only as a matter of replacing one type of transport with another but also as the dissolution of the cavalry's way of life on the battlefield. The horse had been an integral part of men in war. Even after WWI, with the rise of trench warfare, poison gas, and powerful artillery, the cavalry remained resolute in its belief that mobility was the key to victory. According to a 1925 Cavalry Journal article, "Mobility, fire power, and shock are the characteristics of cavalry. The

⁴² Oliver McKee, Jr., "With the 'Cavalree' at Fort Riley," The Cavalry Journal 34, no. 138 (January 1925): 72.

⁴³ Colonel H. S. Stewart, "Mechanization and Motorization: The Final Chapter Has Not Been Written," The Cavalry Journal 49, no. 217 (January–February 1940): 41.

greatest of these is mobility.”⁴⁴ What was different in 1925 was that mobility prepared the way for machine guns to execute a fatal attack,⁴⁵ whereas the 1914 cavalry regulations manual recommended the actual killing be executed by the cavalymen themselves, while machine guns served only to clear their path.

While the 1914 cavalry manual approach would soon be proven ineffective in WWI, the position of many high-ranking cavalry officers was that mobility remained indispensable to winning wars, regardless of who or what delivered the fatal blow to the enemy. As the Commander-in-Chief of the British forces in France stated after WWI, “The power of an army as a striking weapon depends on its mobility. Mobility is largely dependent on the suitability and fitness of animals for army work.”⁴⁶ The horse was fervently held to be indispensable to the army’s combat arsenal, despite its proven ineffectiveness against machines guns.

Warhorses and Men of War: Interchangeability in Functional Specifications

To the cavalry, the horse provided the speed necessary to stay ahead of rapid changes on the battlefield. A major in the Ordinance Reserve described battles as incredibly rapid so that “when things happen they happen very fast.”⁴⁷ The enemy was a moving target, and a good horse was necessary to keep up with his movements. Unlike in the civilian setting, where equine instinct provided many advantages in the carrying out of domestic duties, a warhorse had to be trained to suppress this instinct, particularly in its need to flee from danger.

Horses had to follow cavalry commands, even if such commands led them charging toward their deaths. Good horses were described as possessing a high degree

⁴⁴ Lininger, “Mobility, Fire Power, and Shock,” April 1925, 178.

⁴⁵ *Ibid.*, 178–179.

⁴⁶ Captain Sidney Galtrey, *The Horse and the War* (London: Country Life, 1918), 11.

⁴⁷ Major James R. Randolph, “Mental Mobility,” in *Cavalry and Armor*, ed. Royce R. Taylor, Jr., (Fort Knox: United States Armor Association, 1986), 59. Also in *The Cavalry Journal* 49, no. 217 (January–February 1940): 10.

of courage, endurance, and speed, as well as an even temperament when faced with danger,⁴⁸ a description that could very well apply to a good cavalry leader. In this sense, the cavalryman's positive qualities were almost interchangeable with the qualities of a good horse.

In order to be successful on the battlefield, a warhorse had to be trained, just like any soldier, to overcome its fears. Intelligence and sensory nerves had to be suppressed in order to win battles. Warhorses would be "easily governed by the consistent application of recognized aids applied with kindness," and differences among warhorses "[would] be offset in part by intelligent training."⁴⁹ In many ways, these requirements describe a machinelike profile in which the horse's inherent instinct for self-preservation was suppressed so that it followed orders without resistance. There was also a machinelike quality to the military's "intelligent horse training," which differed from the civilian use of the term.

Intelligent horse training in the military would not be considered intelligent to the average civilian. Military horses had to be, first and foremost, easily governable and predictable. An army general described the importance of spending enough time in training a horse because "one great difficulty in raising new cavalry [was] that the horses [were] new, untrained, fractious, and that the men [had] not yet learned to ride."⁵⁰ While civilians would appreciate an intelligent horse that avoided danger, in the military, an intelligent horse would not exhibit independent thinking and would overcome its instinct for self-preservation at all costs.

Good horses, like good soldiers, must follow orders without resistance, and their peculiarities had to be ironed out, in a process much like standardization in mass

⁴⁸ An Ex-Cavalryman, "By Their Horses Ye Shall Know Them," *The Cavalry Journal* 33, no. 135 (April 1924): 199.

⁴⁹ "Fundamentals of Cavalry Training Policy," ed. Jerome W. Howe, *The Cavalry Journal* 30, no. 123 (April 1921): 184.

⁵⁰ Brigadier General James Parker, "The Cavalryman and the Rifle," *The Cavalry Journal* 37, no. 152 (July 1928): 366.

production. What would emerge from the military's intelligent training was an army of fairly homogeneous combat warhorses with a range of predictable and hence controllable responses. Horses had to become "mechanical" in order to withstand the rigors of war.

The Percheron, a light draft horse, was considered ideal for military purposes because of its machinelike quality. Able to withstand the strain, exposure, and hardship of the battlefield, the horse could "best meet the exacting demands of modern warfare."⁵¹ A light Percheron, weighing around 1,500 pounds, was considered the "Allies' most successful war-horse"⁵² and was even described as "the best artillery horse the world had ever seen."⁵³ Indeed, the technical specifications of a mechanical horse would later prove to be nearly equivalent to the physical traits of the Percheron.

Horses were kept in reserve for as long as possible in order to save their strength for fighting battles. The US Cavalry, emphasizing prompt action over planning, placed less emphasis on reconnaissance and hence delegated this task to motorcars. According to the US 1914 Cavalry manual, motorcars were to be used for reconnaissance to conserve the strength of the horse for combat.⁵⁴ The British fighting style, taken to be more deliberative, differed from the American style of boldness and prompt action.

The British cavalry highly valued reconnaissance and relied on the horse to perform this important task. The British cavalry commander typically dispatched the maximum possible number of cavalryman to obtain much-valued strategic information in order to determine his plan of attack. The British, emphasizing planning and intelligence, sent horses to perform what was deemed the most critical task, while the American forces deemed fighting performance more important and thus saved the

⁵¹ Galtrey, The Horse and the War, 124.

⁵² *Ibid.*, 123.

⁵³ *Ibid.*, 128.

⁵⁴ Cavalry Service Regulations, 1914, 227.

horse for the battlefield. Regardless of the approach, the horse was consistently used in those tasks deemed most critical. The role of the motorcar supported that of the horse.

The US Cavalry's battle routines, combat style, and training revolved around the use of the horse. Faith and trust in the horse led the cavalry to assign tasks deemed most strategic in winning wars to mounted rather than to motorized operations. This trust in the horse can be understood as confidence in the familiar and, hence, as a means to minimize the level of uncertainty. Because cavalrymen understood horses better than motorcars, they presumably could better factor their weaknesses and strengths into their plans, and in this sense, horses were more controllable and predictable in carrying out critical missions compared with motorcars. At the same time, the cavalry's elite status also may have influenced the assignment of critical tasks.

While social class hierarchies were not as prominent in the United States as they were in Great Britain, there was nevertheless a sense of superiority felt within the US Cavalry with regard to other branches of the military.⁵⁵ The replacement of the horse meant the loss of the cavalry's elite status, along with its romantic imagery. The use of horses in Europe was also associated with nobility and aristocracy. During the Middle Ages, mounted knights were the highest status warriors in England and elsewhere in Europe. Indeed, the word "cavalry" comes from the French word *chevalier*, or mounted knight.

Thus the threatened removal of the horse constituted a collapse in the fundamental elements of the cavalry. A cavalry lieutenant-colonel wrote in the late 1890s that "without horses there can be no cavalry."⁵⁶ Twenty years later, a cavalry captain made a similar declaration: "Without the horse, the cavalry had been deemed

⁵⁵ Stubbs and Connor, Armor-Cavalry Part I, 3.

⁵⁶ Lieutenant-Colonel Jean Jacques Théophile Bonie, The French Cavalry in 1870, ed. Captain Arthur L. Wagner, trans. C. F. Thomson, in Cavalry Studies from Two Great Wars, International Series, vol. 2 (Kansas City, MO: Hudson-Kimberly Pub. Co., 1896), 125.

‘practically useless.’”⁵⁷ According to a 1925 article, “The horse makes cavalry, distinguishes cavalry from foot troops, and gives the arm its characteristic of mobility. Cavalry therefore may operate within the powers of the horse and is held by his limitations.”⁵⁸

A 1925 Cavalry Journal article may well have been a campaign to protect the paramount position of the horse in military combat. The argument was that the horse was essentially indistinguishable from the cavalryman himself and from the entire cavalry as an organization. To further advance the cause of the cavalry, a major general even argued that men and machines were dispensable but that horses were not: “There are many things in war that can not be done by men nor machines; and that only animals can do.”⁵⁹

A soldier writing to his brother of his WWI experience advised, “The horses must come before anything else and you must always bear this in mind. No matter how much work is to be done on other jobs, be sure the horses have been attended first.”⁶⁰ Such was the importance of horses that their replacement was perceived as the destruction of the cavalry.

The Horse on Trial: Pressures to Motorize

The wartime experience of the cavalry during WWI was painfully thin, however. Out of the seventeen cavalry regiments in the US Army, only one, the 2nd Cavalry, was sent to Europe, and there it spent most of its time, as the last Chief of Cavalry Major General Herr described it, working on the “thankless and uncongenial task of running various remount stations.”⁶¹ Some US Cavalrymen sent to the

⁵⁷ Gordon-Smith, “The Role Played by the Serbian Cavalry in the World War,” July 1922, 245.

⁵⁸ Lininger, “Mobility, Fire Power, and Shock,” April 1925, 181.

⁵⁹ Major General James G. Harbord, “The Part of the Horse and the Mule in the National Defense,” The Cavalry Journal 35, no. 143 (April 1926), 159.

⁶⁰ “The Horses Come Before Anything Else,” The Cavalry Journal 37, no. 152 (July 1928): 415.

⁶¹ Major General John K. Herr and Edward S. Wallace, The Story of the U.S. Cavalry 1775–1942 (Boston: Little, Brown and Company, 1953), 243.

battlefield in August 1918 to pursue retreating German soldiers were outfitted with a “hodge-podge” of animals that resembled, again in the words of Major General Herr, “Don Quixote and Sancho Panza chasing after windmills.”⁶² The Chief of Cavalry felt that the respect and honor accorded the heroes of the Civil War was lacking. It was clear that the cavalry deeply resented the secondary role it played in WWI. The once proud and brave cavalymen were essentially reduced to comic figures.

The fearlessness and prompt action that characterized the fighting style of the cavalry appeared foolish when wave upon wave of horses and men fell in front of German machine-gun fire. Despite lessons learned by the French and British cavalries early in the war, American soldiers fought in 1917 with the same aggressiveness and rashness found in the cavalry tradition. George Marshall explained the American disposition in 1918: “Our men gave better results when employed in a ‘steamroller’ operation, their morale suffered from delays under fire, their spirits were best maintained by continuous aggressive actions.”⁶³ However, the US cavalry’s offensive attacks near the end of WWI no longer commanded the admiration they had inspired in the American Civil War, for the nature of war had changed.

The “lightning strike” of German mechanized forces through Belgium during WWI rendered the US cavalry and cavalry style of attacks obsolete. Tanks replaced horse-drawn cannon and thus, despite the War Department’s continued support of the US Cavalry, it could no longer simply dismiss pressures to replace the horse. What, then, would justify the existence of the cavalry in the face of modern warfare? While the US Cavalry could not easily justify its importance abroad, it found a useful cause domestically—the capture of Pancho Villa. The services of the horse had been

⁶² Ibid.

⁶³ Gregory J. W. Urwin, *The United States Infantry: An Illustrated History, 1775–1918* (Norman: University of Oklahoma Press, 2000), 166.

invaluable in guarding the long border with Mexico, where mountainous terrain and nonexistent roads rendered motorcars unusable.

Unfortunately for the cause of the horse, even in the Mexican expedition, the motorcar began to emerge as a viable alternative. Ironically, the very figure who actively sought to block motorization, George Patton, led the first publicized use of the motorcar in combat. In May 1916, the then-Lieutenant George Patton killed a critical member of Pancho Villa's guerrilla force, Julio Cardenas, and three other men, using the automobile as a form of warhorse. Patton and his men rode their automobiles much as cavalymen used horses for mobility and mounted attacks. Patton later described this motorized warfare as simply a matter of employing the car like a horse and insisted that only cavalymen were best suited to utilize the motorcar as such.⁶⁴ The combat application of the motorcar made headlines and popularized it as a potential combat weapon.

Suddenly cavalry combat was no longer *exclusively* associated with the horse. The stark contrast between the horse as a combat weapon and the car as a transport vehicle began to blur. Perhaps sensing this trend, Patton immediately sought to de-emphasize the glorious moment of the motorcar and insisted that the combat use of the automobile was simply a matter of *continuation* of the great horse tradition.⁶⁵ But the well-publicized shift from muscle to motor combat appeared in newspaper headlines, and the indispensability of the horse in military combat functions became less definitive. The motorcar's features, after all, were not radically different from what soldiers expected of a trained military horse. Horses had been trained to be machinelike in disposition in order to survive the rigors of war.⁶⁶ As discussed earlier,

⁶⁴ Martin Blumenson and George S. Patton, The Patton Papers (Boston: Houghton Mifflin, 1972), 331–337.

⁶⁵ *Ibid.*, 337.

⁶⁶ This example supports Dreyfus's claim that it is more feasible for humans to become like machines than vice versa. For details, see Hubert L. Dreyfus, What Computers Can't Do: A Critique of Artificial Reason (New York: Harper & Row, 1972).

the performance of exceptional warhorses had always been machinelike in the face of danger.

However, the cavalry maintained a stark disassociation between muscle and motor power. The War Department's higher-ranking officers, sympathetic to the long tradition of horse culture in the military, ruled against complete motorization in the 1920s by officially citing the lack of cross-country capability in motorcars as a significant limitation.⁶⁷ Modern warfare, many argued, was still a war of mobility. In a war of mobility, the horse was considered irreplaceable.

Military work came to be defined in terms of tasks associated with the horse such as cross-country movements. Battlefields encompassed varied terrain. Thus reconnaissance work had to be conducted principally in cross-country terrain in order to prevent detection. In defining war by *where* it was fought rather than by *how*, one could argue that horses were the only sensible means by which soldiers could carry out their daily work. As Patton aptly phrased it:

True, there are a limited number of gasoline neophytes who, while admitting the impossibility of using machines in such country, avoid the issue by the happy statement that, in future, wars will not take place in that sort of country. The futility of such evasions seems almost too flagrant to merit remark.⁶⁸

The argument for the survival of the horse became a matter of discrediting the motorcar, the reverse of what happened with the horseless carriage, discussed in Case One, in which the horse was discredited. The style of contention, however, was strikingly similar. In this case, it was the motorcar that failed to meet the physical

⁶⁷ Cary, "The Use of the Motor Vehicle in the United States Army," 133–136. See also Johnson, Fast Tanks and Heavy Bombers, 56.

⁶⁸ Major George S. Patton, "Motorization and Mechanization in the Cavalry," The Cavalry Journal 39, no. 160 (July 1930): 333.

standards set by the horse. Patton described how “obstacles that appear trifling to a well-mounted Cavalryman often put serious handicap upon machines.”⁶⁹

Motorcars could not function at night, in the fog, in storms, or in deep snow. Neither could they traverse mud and water as well as horses could. A cavalry captain stated categorically that “horses could explore portions of the terrain impracticable for motors.”⁷⁰ Enemies would be alerted by the noise of an oncoming motorcar, which, in addition, would leave behind tire marks that could easily be traced. Patton argued that “without gasoline, machines are junk,” and thus without this “priceless liquid,” the mobility of soldiers would be seriously undermined, resulting in a situation “far more fatal than enemy fire.”⁷¹

Horses, on the other hand, could eat anywhere and whenever possible, whereas gasoline might not be readily found. The motorcar could not replicate the qualities and acquired wartime experience the horse had provided the army for many years. For these reasons, the motorcar was *not the equivalent* of the horse. A major claimed that many wars had been fought without mechanical transport but that no wars had yet been fought without horses.⁷² Another captain of the cavalry argued similarly: “The horse was first an animal of war, and it is inconceivable that war will ever be waged without him.”⁷³ As late as 1939, the last Chief of Cavalry testified before a congressional committee that the horse had “stood the acid test of war” while the motorcar had not.⁷⁴

⁶⁹ Major G. S. Patton, Jr., “Mechanization and Cavalry,” The Cavalry Journal 39, no. 159 (April 1930): 236.

⁷⁰ Captain Leonard Nason, “Horse and Machine,” The Cavalry Journal 38, no. 155 (April 1929): 193.

⁷¹ Major George S. Patton, “Motorization and Mechanization in the Cavalry,” The Cavalry Journal 39, no. 160 (July 1930): 345.

⁷² Major General James G. Harbord, “The Part of the Horse and the Mule in the National Defense,” The Cavalry Journal 35, no. 143 (April 1926), 159–160.

⁷³ Captain George L. Caldwell, “A History of Cavalry Horses,” The Cavalry Journal 37, no. 153 (October 1928): 557.

⁷⁴ “Cavalry Affairs before Congress,” The Cavalry Journal 48, no. 211 (January–February 1939): 132.

Despite the German mechanized force attack in WWI, Patton, who was a lieutenant colonel commanding the 304th Tank Brigade in 1918 in France,⁷⁵ stated, “A general survey of the tactical tendencies at the close of the World War seems to point to greater, and not lessened, usefulness and importance for cavalry.”⁷⁶ The same argument was used by a cavalryman who insisted that modern warfare enhanced the cavalry’s strength: “It has been said that the development of scientific and mechanical weapons renders the cavalry useless. On the contrary, these weapons give the cavalry an added efficiency.”⁷⁷ These modern weapons, it was argued, could be easily incorporated into mounted attacks, although how such attacks could be carried out in modernized warfare without significant casualties remained unclear.

Nevertheless, a captain stated, “War is a conflict between elements of flesh and blood, and inanimate armament is but a means by which it may be more successfully waged.”⁷⁸ Fundamental to these arguments was the privileged position of the cavalry and the sanctity of the horse, regardless of technological changes occurring in the outside world. The cavalry toward the end of the 1920s became increasingly resolute, arguing a line of thought that demanded absolute conviction—almost a leap of faith—at a time when valid arguments had been advanced regarding the questionable value of the horse in modern warfare.

An article attributed to “one of the faithful” stated, “As cavalrymen, we must have faith in the cavalry service, and we must have a doctrine which will allow other branches to see how well we keep the faith. To the cavalry itself, that faith must be sacred.”⁷⁹ Faith thus meant unquestionable acceptance of the status quo: its tradition,

⁷⁵ Stubbs and Connor, Armor-Cavalry Part I, 45.

⁷⁶ Major George S. Patton, Jr., “What the War Did for Cavalry,” The Cavalry Journal 31, no. 127 (April 1922): 169.

⁷⁷ Walker, “Cavalry in the World War,” January 1924, 11.

⁷⁸ Caldwell, “A History of Cavalry Horses,” October 1928, 557.

⁷⁹ “One of the Faithful,” “Faith in and a Doctrine for the Cavalry Service,” The Cavalry Journal 36, no. 147 (April 1927): 227.

leadership, combat strategy, and most of all, the inseparability of the horse from the cavalry.

This nearly religious position, in an organization that prided itself on having sentiment only upon the “execution of a plan drawn in cold reason,”⁸⁰ required cavalrymen to ignore the impending changes brought about by modern warfare. A colonel stated it differently: “Every great general of the war has expressed his belief in the future brilliant role of cavalry. It is only the lesser individuals who refuse to be informed, close their eyes and choose to doubt.”⁸¹ Hence anyone who chose to critically examine the viability of the cavalry in modern war was described as ignorant and uninformed and was considered an outsider.

Adna Chaffee, often referred to as the “father of American armor,” who began his campaign for mechanization in 1927, had been told by the President of the War College to be “visionary and crazy” when he delivered a lecture calling for greater use of advances made in the automotive industry for military purposes.⁸² Patton argued, however, that the incorporation of machines would only condemn the army to “disaster and defeat.”⁸³ Again according to Patton,

Regardless of the progress made in the development of fighting machines, Cavalry will always be necessary. It will hold its own because no other agency can perform Cavalry duties with equal reliability and dispatch. It can operate effectively in woods and mountains where machines cannot go; it can swim streams that would stop machines; and whether its supply trains come through or not, it can carry on day and night under any conditions of roads and weather. To expect mechanical vehicles—impotent without regular supplies, blind and deaf to control, and restricted by terrain—to take over these duties, is to expect the impossible.⁸⁴

⁸⁰ Major A. D. Surles, “Cavalry Now and to Come,” The Cavalry Journal 40, no. 164 (March–April 1931): 5.

⁸¹ Hawkins, “The Importance of Modern Cavalry,” October 1926, 489.

⁸² Colonel Wesley W. Yale, General I. D. White, General Hasso E. von Manteuffel, Alternative to Armageddon (New Brunswick: Rutgers University Press, 1970), 76–78.

⁸³ Patton, “Motorization and Mechanization in the Cavalry,” July 1930, 334.

⁸⁴ Patton, “Mechanization and Cavalry,” April 1930, 237.

For Patton, there was no substitute for the horse. Perhaps similar to the argument of scholars on artificial intelligence, Patton pointed to the inability of the motorcar to match, item for item, each of the horse's capabilities. Thus Major General Williard A. Holbrook, Chief of Cavalry, recommended that if the cavalry were to motorize as required under the 1920 Defense Act,⁸⁵ it be for the purpose of enhancing the capabilities of horses, not supplanting them.⁸⁶ It is conceivable that Holbrook's approach was a concession for the purpose of *containing* the influence of the motorcar within the cavalry. The succeeding Chief of Cavalry, Major General Herbert B. Crosby, also used the same tack, suggesting in 1928 that machines should be used to supplement horses.⁸⁷

However, the initial reconciliatory move of the Chiefs of Cavalry to incorporate motorization came to a halt when MacArthur, as Chief of Staff in 1931, sought to institute a sweeping change to a modernized army.⁸⁸ In a written statement released by the War Department on May 18, 1931, MacArthur stated,

Thus there has grown up in the public mind a very natural conception that Cavalry must include the horse. Modern firearms have eliminated the horse as a weapon, and as a means of transportation he has become, next to the dismounted man, the slowest means of transportation.⁸⁹

MacArthur's mandate was in line with the growing trend toward motorization, which began with President Woodrow Wilson's comments about war. Wilson, quoted by Major General George Van Horn Moseley in a Cavalry Journal article, hinted at the obsolete style of boldness and bravery in cavalry battles. "Modern wars are not won by mere numbers. They are not won by mere enthusiasm. They are not won by mere

⁸⁵ George Vidmer, "Major General William Ames Holbrook," The Cavalry Journal 41, no. 174 (November–December 1932): 43.

⁸⁶ Johnson, Fast Tanks and Heavy Bombers, 124–126.

⁸⁷ Johnson, Fast Tanks and Heavy Bombers, 126.

⁸⁸ John B. Wilson, Maneuver and Firepower (Washington, DC: Center of Military History United States Army, 1998), 123.

⁸⁹ "Mechanized Force Becomes Cavalry," The Cavalry Journal 40, no. 165 (May–June 1931): 5.

national spirit. They are won by the scientific conduct of war, the scientific application of industrial forces.”⁹⁰ This emphasis on “scientific application” over the traditional values of patriotism and courage was a direct hit to the idealized but nonetheless fundamental values of the cavalry’s fighting principle and the cavalryman’s identity as a soldier.

One of the initial but symbolic moves to modernize the cavalry in the 1930s was to de-emphasize the importance of the horse in war and to emphasize the role of modern weaponry. For instance, the pack the horse carried containing firepower and ammunition was touted to be more vital than the horse. A colonel said unequivocally that the pack was now the most important element in a cavalier’s outfit:

It requires no study to see at once that the pack element of the command is of the greatest importance in all cavalry operations. It includes the bulk of the fire power with its ammunition, the signal communications, demolitions and messing facilities. Without its packs Cavalry would be reduced to approximately the power it had at the end of the Civil War and would be out of place in modern combat.⁹¹

The pack, a lifeless material, now superseded the horse in importance. Some officers were even of the opinion that without the machine gun in the pack, the horse would be rendered useless on the battlefield.⁹² While the 1914 cavalry manual’s fighting philosophy—an attitude that held throughout much of the 1920s—placed modern weapons in a supportive role for mounted troops, the new emphasis on modernization in the 1930s placed firepower at the center of its combat strategy. Mounted troops came to be only as important as the packs they carried.

⁹⁰ Major General George Van Horn Moseley, “Industry and National Defense,” The Cavalry Journal 40, no. 162 (January 1931): 18.

⁹¹ Colonel Daniel Van Voorhis, “Packs and Leading,” The Cavalry Journal 39, no. 161 (October 1930): 498.

⁹² First Lieutenant Wesley W. Yale, “The Influence of Pack Loads on the Employment of Cavalry,” The Cavalry Journal 43, no. 184 (July–August 1934): 19.

Horses, in this view, were no longer as critical as the mobility they provided. The cavalry kept its integrity as a combat arm only insofar as it was geared with the appropriate amount of firepower. Indeed, a brigadier general stated in 1940, “With the increasing efficiency of hand firearms and their consequent increasing use, the horse soldier more and more found that his usefulness on the battlefield was limited.”⁹³ Thus it appeared that in order to survive, the cavalry had to begin seriously considering military life without the horse. A lieutenant stated:

Our Cavalry is instinctively hostile to any machine which may supplant the horse, and inclined to disparage its effect. We are retreating to mountain trails and thick woods, hoping that no fast tank can follow. Our policy, on the contrary, should be to encourage the new arm, experiment with it, and bring out its characteristics, both favorable and unfavorable, since the place of the new arm in the army team, its missions and tactics, are far closer to those of Cavalry than they are to any other arm. The cavalryman is best able to understand its potentialities. It is improbable that a machine will ever be invented that is more efficient for all military purposes than the horse. But whether our cavalry divisions are completely mechanized or not, cavalry missions and cavalry tactics will remain, and the mechanized force will act in conjunction with the Cavalry.⁹⁴

The cavalry lieutenant who wrote this piece recognized the strengths and limitations of machines in serving military needs but nevertheless promoted their use. Similar to MacArthur, he sought to redefine the cavalry in terms of its mission and tactics rather than the means by which it went to war. As a cavalry colonel observed,

We are living in a machine age and to be modern, Cavalry must take every advantage of the machines this age places at its disposal. This the Cavalry has done, and will do, more and more as these mechanical auxiliaries are developed and proved of value.⁹⁵

⁹³ Brigadier General Henry J. Reilly, “Horse Cavalry and the Gas Engine’s Children,” The Cavalry Journal 49, no. 217 (January–February 1940): 3.

⁹⁴ Lieutenant Colonel K. B. Edmunds, “Tactics of a Mechanized Force: A Prophecy,” The Cavalry Journal 39, no. 159 (July 1930): 410.

⁹⁵ Major E. C. McGuire, “Armored Cars in the Cavalry Maneuvers,” The Cavalry Journal 39, no. 160 (July 1930): 397.

Under MacArthur, the 1st Cavalry, the oldest and most respected regiment, was ordered to dismount and to begin experimenting with motorization and mechanization. This mandate was taken as a signal of the increasing expansion of mechanical auxiliaries in the cavalry. With the move to disengage the horse from the cavalry, a search for what now defined the cavalry began.

Major General Guy V. Henry, Chief of Cavalry in 1932, articulated the crisis in the cavalry's organizational identity, asking, "If the cavalry is less important today than it has been in the past, of what are we speaking?" "No one knows," he said, "for there is no standardized conception of cavalry."⁹⁶ In opening up the definition of cavalry to something non-definitive, Henry disengaged its traditional identification with the horse and launched the search for a new meaning.

Cavalries in other countries faced similar pressures. Germany posed the same question, seeking to define "what modern cavalry looks like, what it does and what can be required of it."⁹⁷ In more pessimistic terms, a French cavalier asked, "Will there be room for cavalry missions in the war of tomorrow?"⁹⁸ Italy's policy after WWI had also been to move away from using horses.⁹⁹ The proud, long tradition of the cavalry and its elite status seem unsustainable without the horse.

"Breeding" a Motorcar: Conceptual Origins

The Chief of Cavalry, Guy Henry, was asked point blank in a 1937 congressional hearing, "Is the horse obsolete?" Instead of answering the question directly, Henry responded with another question, "Can the modern iron horse supplant

⁹⁶ Major General Guy V. Henry, "The Trend of Organization and Equipment of Cavalry in the Principal World Powers and Its Probable Role in Wars of the Near Future," *The Cavalry Journal* 41, no. 170 (March–April 1932): 5.

⁹⁷ Lieut. Gen. G. Brandt, "Why is the Cavalry Still Necessary?" *The Cavalry Journal* 41, no. 171 (May–June 1932): 46.

⁹⁸ Chef D'Escadrons Breveté Mariot, "The Cavalry's Problem," *The Cavalry Journal* 43, no. 183 (May–June 1934): 14.

⁹⁹ John Joseph Timothy Sweet, "Ferrea Mole, Ferreo Cuore: The Mechanization of the Italian Army, 1930–1940" (PhD diss, Kansas State University, 1976), 150.

the animal horse?”¹⁰⁰ Henry reframed motorization, *not* as a phasing out of the horse, but as a transfer of capabilities from a biological to an iron form. The cavalry, despite its continued display of defiance, recognized the need to find ways to preserve equine tradition in the midst of an increasingly mechanized world. Similar to the discourse regarding motor power mimicking muscle power in the civilian setting, military conversations about motorcars articulated in terms of horses appear to have provided the initial means to open the doors to motorization.

As early as the 1920s, an ex-cavalryman, in praise of the horse, made a parallel between the circulating water system of the motorcar and the bloodstream of the horse. He also compared the motor’s radiator to the horse’s lungs:

Let us make a comparison between the horse and the motor. When the motor is working, heat is rapidly developed. When the temperature exceeds a certain degree, the efficiency of the motor is lessened, if it does not cease to function altogether. To accomplish the liberation of heat, most motors are provided with a circulating water system and a radiator. The water circulating through the heated working parts takes up the heat, or a portion of it, and carries it to the radiator, where it is liberated. The radiator is so constructed as to expose a maximum surface to the air. If this surface be appreciably reduced, the cooling out is retarded. In the horse, the blood stream and the lungs can be compared roughly to the water system and the radiator of the motor. The blood circulating through the working parts—the muscles—takes up toxins and heat and carries them to the lungs, where they are given off through expiration.¹⁰¹

This simple example of a one-to-one correspondence between muscle and motor power shows conceptual associations occurring around the time when the cavalry was most adamantly against motorization. The description of the motorcar’s cooling system, phrased in terms of the horse’s biological workings, provides a conceptual link between mechanical and biological functions. The horse was described as

¹⁰⁰ “Necessity for Horsed Cavalry Under Modern Conditions: Extract from the Recent Hearings Before the Subcommittee of the Committee on Appropriations, House of Representatives, on the War Department Appropriation Bill, 1938,” *The Cavalry Journal* 46, no. 201 (May–June 1937): 251.

¹⁰¹ An Ex-Cavalryman, “By Their Horses Ye Shall Know Them,” *The Cavalry Journal* 33, no. 135 (April 1924): 199–200.

releasing heat to the air through expiration while the motorcar used the surface of the radiator to accomplish the same purpose. Although the motorcar was considered operationally inferior to the horse, there was, nevertheless, an effort to compare the two on similar grounds.

Another discourse regarding the motorcar, again phrased in terms of the superiority of the horse, relates to the need to “breed” an “iron horse” specifically designed for battle.¹⁰² A colonel described how the cavalry should delineate the requirements needed for combat cars rather than make do with commercially designed vehicles:

Therefore, in this day of the “Iron Horses” for use on cavalry missions we should fix our types and demand breeding (i.e. speed, correct design, and equipment) and insist upon these requisites. To adopt a policy for taking any cheap ill-bred scrub iron horse obtainable in quantity on the streets of the nation is certain to greatly reduce the effectiveness of mechanized cavalry units in the performance of their missions. It is a makeshift poorly planned procedure.¹⁰³

The colonel sought to apply fundamental principles of horse breeding to the designs of an ideal cavalry car. He rejected the idea of making do with commercial cars. “The cavalry knows by practical tests that such commercial vehicles do not meet all cavalry needs by any means.”¹⁰⁴ Modified commercial cars, he argued, were “fundamentally unsound,” and their supporters “display[ed] an ignorance of cavalry experimentation to date.”¹⁰⁵ Despite the derision of the motorcar, conceptual links were being established and comparisons made. Hence, criteria for an ideal cavalry car started to creep into the thoughts of cavalry.

¹⁰² Colonel Charles L. Scott, “Progress in Cavalry Mechanization: Scout Car Developments,” The Cavalry Journal 45, no. 4 (July–August 1936): 281.

¹⁰³ *Ibid.*, 284.

¹⁰⁴ Stewart, “Mechanized Cavalry Has Come to Stay,” November–December 1938, 284.

¹⁰⁵ *Ibid.*

Many military authorities indicated that commercial cars, particularly the Ford Model T, were too light and fragile for combat.¹⁰⁶ On the other hand, large, ponderous vehicles, such as those used in WWI from the Four Wheel Drive Auto Company of Clintonville, Wisconsin, stood out, and made an easy target for enemy fire.¹⁰⁷ The American Minneapolis-Moline truck with four-wheel drive was sturdy but sank in soft ground.¹⁰⁸ The standard Chevrolet two-wheel-drive passenger car, which had been tested by the military since the 1920s, was lightweight but did not perform well in cross-country terrain.¹⁰⁹ Marmon-Harrington's 1930s four-wheel-drive truck was similarly ineffective because it was too heavy for reconnaissance missions and too hefty for quick maneuvers on the battlefield.¹¹⁰

The problem with these commercial vehicles was that one desirable feature conflicted with another. The power, performance and durability of four-wheel drive, for instance, conflicted with the need for light weight and agility on the battlefield. A cavalry major summarized the dilemma: "It is the combination of all desirable features which presents a problem."¹¹¹ He recounted that many cavalry officers wanted a sturdy machine that could traverse gullies, stumps, rocks, and carry various items of equipment and artillery, while at the same time, they "[didn't] want one of these big, expensive monstrosities such as the present scout or combat car."¹¹² In other words, they wanted something that performed like what they were used to and which was an equivalent of the horse.

¹⁰⁶ Konrad F. Schreier, Jr. "The Military Model T Ford," Military Collector & Historian 39, no. 3 (1987): 99.

¹⁰⁷ Arch Brown and the Editors of Consumer Guide, Jeep: The Unstoppable Legend (Illinois: Publications International, Ltd., 2001), 11–12.

¹⁰⁸ Graham Scott, Essential Military Jeep: Willys, Ford & Bantam Models, 1941–45 (Bideford, Devon England: Bay View Books Ltd., 1996), 7.

¹⁰⁹ Konrad F. Schreier, Jr. "Born for Battle," Military Jeeps 1941–1945. Surrey: Brooklands Book Distribution Ltd., n.d., 30.

¹¹⁰ Scott, Essential Military Jeep, 9.

¹¹¹ Major Robert W. Grow, "Military Characteristics of Combat Vehicles," The Cavalry Journal 45, no. 6 (November–December 1936): 508.

¹¹² Grow, "Military Characteristics of Combat Vehicles," November–December 1936, 509.

Patton expressed the same sentiments: “But, to be useful in any of the above capacities, the car must be mobile, practical, and simple to repair—not a costly, hypothetical monstrosity.”¹¹³ Patton was describing the light tanks that the cavalry acquired from the infantry, which had been initially solely responsible for them as a result of the 1920 Defense Act.¹¹⁴ When the cavalry also assumed responsibility for light tanks in 1931 under the directives of Chief of Staff General Douglas MacArthur, they renamed them “combat cars” to distinguish their tanks from the infantry, but essentially they were the same tanks ¹¹⁵ (Figure 3.1).



Figure 3.1. Early Cavalry Cars.

Source: Colonel Bruce Palmer, “Mechanized Cavalry in the Second Army Maneuvers,” The Cavalry Journal 45, no. 6 (November–December 1936): 462.

Thus given the need to balance robustness, speed, and mobility in the field, a balance these combat cars by virtue of their sheer size certainly could not provide, Major Grow stated, “Decisions must be made as to the relative importance of several contradictory factors.”¹¹⁶ He recommended giving mobility the highest importance in

¹¹³ Major G. S. Patton, “Armored Cars with Cavalry,” The Cavalry Journal 33, no. 134 (January 1924): 10.

¹¹⁴ Encyclopedia of American Military History, vol. 3, P to Z, 840-841.

¹¹⁵ *Ibid.* Also in Johnson, Fast Tanks and Heavy Bombers, 118. Also in Stubbs and Connor, Armor-Cavalry Part I, 52.

¹¹⁶ Grow, “Military Characteristics of Combat Vehicles,” 509.

the list of requirements. In this regard, the horse still remained unrivaled, most particularly in cross-country capability. Commercial vehicles could not fully satisfy this requirement. This was not because of a lack of available technological know-how but, as the cavalry major stated, because of the difficulty of combining various technical specifications into one artifact, much like the way the horse provides significant strength and power relative to its weight.

One can argue that much of the opposition to the motorcar at this time rested upon its significantly inferior combat-related functionality relative to the horse. The fastest car would not necessarily be desirable for military use, because speed would compromise the vehicle's sturdiness. A sturdy machine, on the other hand, would weigh more, compromising speed and agility on the battlefield. Deciding at what level of weight, power, and performance these specifications should be set in order not to counteract, but rather to complement, each other resulted in much discussion in the Cavalry Journal.

Specifications for a Cavalry Car: The Iron Horse in Conceptual Form

Because modified commercial vehicles could not satisfy the needs of the cavalry, many articles were written in the 1930s on the technical specifications of an ideal cavalry car. It is interesting that these articles consistently reiterated the same message: the cavalry car had to be lightweight, rugged, and have good visibility with cross-country capability—very much the description of an animal warhorse. The demand was not for the fastest, strongest, nor the most heavily armed vehicle.

As early as 1930, a lieutenant colonel began the dialogue in The Cavalry Journal on *possibly* entertaining the idea of replacing the horse:

The development of motor driven vehicles has progressed far enough to make it possible for us, without undue strain on the imagination, to visualize a

machine capable of maneuver and attack across nearly all types of terrain at a speed of from ten to sixty miles an hour.¹¹⁷

First Lieutenant H. G. Hamilton, Cavalry-Reserve, provided a comprehensive list of specifications in a 1935 article:

It would appear that to fulfill the requirements of Cavalry, any type of machine used for reconnaissance should have extreme mobility, be of rugged yet light construction, possess an extended cruising radius, and be able to operate over cross-country terrain as well as on established roads.¹¹⁸

The three general specifications Lieut. Hamilton lists capture the essence of what would later become known as the jeep: (1) it had to be inexpensive and easily produced so that in an emergency, such as a state of war, an ordinary commercial chassis could be easily converted into a wartime vehicle; (2) it had to be designed essentially as a reconnaissance car, whose defensive measures were speed and concealment rather than heavy armor; and finally, (3) it must be able to traverse cross-country terrain at uniform speed.¹¹⁹ Phrased differently, it had to be “speedy, easily concealed amid trees, brush, or in small ravines, and capable of carrying a crew of from one to four men, depending on the mission.”¹²⁰

Major Grow described a vehicle of a “cavalry nature” similar to Hamilton’s but sought to explain the inseparability of mobility from the cavalry’s identity. “Mobility is the paramount characteristic for cavalry. Mobility alone cannot win the battle but without mobility our unit would cease to be a cavalry.”¹²¹ This statement could easily have come out of the 1914 Cavalry Service Regulations except that the

¹¹⁷ Lieutenant Colonel K. B. Edmunds, “Tactics of a Mechanized Force: A Prophecy,” The Cavalry Journal 39, no. 159 (July 1930): 410.

¹¹⁸ First Lieutenant H. G. Hamilton, “A Light Cross-Country Car,” The Cavalry Journal 44, no. 189 (May–June 1935): 30.

¹¹⁹ Hamilton, “A Light Cross-Country Car,” May–June 1935, 30. Also in Grow, “Military Characteristics of Combat Vehicles,” November–December 1936, 510.

¹²⁰ *Ibid.*

¹²¹ Grow, “Military Characteristics of Combat Vehicles,” November–December 1936, 509.

horse would now be in iron form. Major Grow argued that protection, while important, would not be as critical as speed, for speed would allow the necessary offensive attacks to destroy the enemy first.¹²²

Cavalry operations are comparable to open field running in football. Tacklers are likely to spring up from anywhere, flank or rear. Personnel in moving vehicles are rather helpless against surprise fire. Unlike the man on foot, they cannot drop to the ground instantly. They cannot even take rapid advantage of local cover usually available to the mounted man.... Protection, however, must never predominate over mobility and fire power if we expect to carry out cavalry missions. Our real protection consists in striking the enemy first. Our objective must be to "Hit the other fellow before he hits you."¹²³

Indeed, the bold offensive attacks prescribed in the 1914 cavalry manual, in which protection meant being an elusive target rather than wearing heavy armor, began to make sense. As Patton indicated, "Men who fought in tanks would willingly dispense with 50 percent of protection in order to gain 5 percent of mobility."¹²⁴

A colonel described the ideal cavalry car as having technical specifications similar to those Hamilton described: "cars should be light-weight, cross-country type with low visibility to the enemy—but with visibility open to the sky for the crew, and minimum armor."¹²⁵ Another cavalry general phrased it differently, but with the same emphasis on the importance of balancing mobility, weight, fighting power, protection, and stability.¹²⁶ Too much weight meant sacrificing mobility. As Patton observed, buttressed by his wartime experience with tanks, every ounce of extra weight would greatly reduce the machine's fighting capability.¹²⁷ Thus, virtually all articles written on the ideal cavalry car insisted upon two consistent features—mobility and light weight.

¹²² Ibid., 510–511.

¹²³ Ibid., 509.

¹²⁴ Patton, "Armored Cars with Cavalry," January 1924, 10.

¹²⁵ Phillips, "The First Motorized Cavalry," May–June 1934, 10.

¹²⁶ Grow, "Military Characteristics of Combat Vehicles," November–December 1936, 508.

¹²⁷ Blumenson and Patton, *The Patton Papers*, 781.

The insistent emphasis on the importance of mobility could be found in the many objections to the motorcar's dissimilarity to the horse. What disqualified the machine was precisely the shining feature of the horse—its ability to cross various types of terrain:

Vehicular reconnaissance alone will never be able to give the commander all the definite information required. It must be gathered either by men on horseback or men on foot and, considering varied terrain and the time element, horsed cavalry must be available.¹²⁸

The arguments for the use of the horse and the technical specifications for the ideal cavalry car basically mirror each other. The emphasis on cross-country capability and the light weight requirements fit the description of a horse. The horse could easily be manhandled in various environments and was, at the same time, sturdy enough to withstand the pressures of war. It needed to be able to gear up immediately for high speed but also to be robust enough to traverse rough terrain. These were precisely the requirements converted commercial cars purportedly failed to meet. Thus the failure of such vehicles to serve military needs became the justification for keeping the horse.

In creating this ideal cavalry car, the War Department assigned the task of specifying the technical requirements to the offices of the Chief of Cavalry, the Cavalry School, the Cavalry Board, and the First Cavalry (Mechanized). The Chief of Ordnance was also assigned to the task, and it was the only non-cavalry office in the team. The Ordnance Department was experienced in utilizing the services of civilians in scientific matters and maintained close relations with industries during the interwar years.¹²⁹ These offices were ordered to devote their "utmost thought and attention" to crafting a car suitable for the practical use of the cavalry.¹³⁰

¹²⁸ "Necessity for Horsed Cavalry under Modern Conditions," May–June 1937, 251.

¹²⁹ Major-General William Crozier, Ordnance and the World War (New York: Charles Scribner's Sons, 1920), 290.

¹³⁰ Scott, "Progress in Cavalry Mechanization: Scout Car Developments," July–August 1936, 281.

Breeding the Warhorse

The Chief of the Cavalry, together with the Chief of Infantry, submitted to the Secretary of War on July 2, 1940, the technical requirements for a 4X4 quarter-ton prototype: maximum weight of 1,275 pounds, maximum wheelbase of 80 inches, and overall height of 40 inches.¹³¹ By engineering standards, the weight requirement made no mechanical sense, according to Karl Probst, the engineer who designed the prototype. By the time all the military options were added, the weight of the vehicle would reach 2,000 pounds.¹³² While it was a mechanical impossibility to fulfill the military's list of requirements, it was not a physical impossibility.

While no direct written evidence could be found which explicitly states that the military used the actual physical attributes of the Percheron as a template, there were nonetheless numerous articles in the Cavalry Journal indicating the intent to create the mechanical equivalent of a warhorse. The striking resemblance between the technical specifications of the prototype and the physical attributes of the animal horse brings to mind the discourses on the “breeding” of a motorcar and the urgent need to preserve military life built around the horse.

The weight limit of 1,275 pounds,¹³³ for instance, roughly equals the average weight of a light Percheron.¹³⁴ The 40-inch height of the prototype is about the average height of shrubberies found in and around the eastern US, which means that the prototype was intended to hide behind bushes to avoid enemy fire.¹³⁵ With the windshield up, the height of the prototype is 64 inches, or 16 hands in equine terms,

¹³¹ Herbert R. Rifkind, The Jeep: Its Development & Procurement under the Quartermaster Corps, 1940–1943 (London: ISO Publications, 1943), 15.

¹³² Karl K. Probst with Charles O. Probst, “One Summer in Butler—Bantam Builds the Jeep,” Automobile Quarterly 14, no. 4 (1976): 431–437.

¹³³ *Ibid.*, 433.

¹³⁴ The average weight of a Percheron is 1,500 pounds. (See Captain Sidney Galtrey, The Horse and the War (London: Country Life, 1918), 123.) Similarly, draft horses in 1908 had also been calculated to be 1,500 pounds. (See Charles Hayward, “How the Horse and its Load Wear Out Roads,” The Automobile, June 18, 1908, 843.) This weight has not changed for the average Percheron today.

¹³⁵ Bill Munro, Jeep: From Bantam to Wrangler (Marlborough: The Crowood Press Ltd., 2000), 14–15.

exactly the height of an average Percheron. The 80-inch wheelbase, the distance between the front and the back wheel, is exactly the average body length of a Percheron.¹³⁶

Indeed, even if it were a mere coincidence that the technical specifications of the iron horse closely map onto the physical characteristics of an animal horse, a homegrown military device developed in the late 1930s by Major Robert Howie and Master Sergeant Melvin C. Wiley provides evidence of the failure of an “unhorselike” concept despite fully satisfying the cavalry’s list of functional requirements. The official name of the Belly Flopper was the “Howie machine-gun carrier,” although it quickly earned the name “Belly Flopper”¹³⁷ because of the need to maintain a prone position while driving it and the jarring one felt from its lack of suspension, which seems to contradict the imagery conjured by its inventors as gliding like a “snake in the grass.”¹³⁸ Although the “Belly Flopper” has been accorded by the military equal importance with the jeep prototype,¹³⁹ it never captured the imagination of soldiers; it was not even tested under real battlefield conditions (Figure 3.2)¹⁴⁰

Thus it may be possible that ingrained practices built around the horse failed to be carried out by an object envisioned as a different animal despite fulfilling in paper all the functionalities explicitly articulated by the military. What the Belly Flopper did contribute, however, was its chassis, which came from the British Austin Seven automobile.¹⁴¹ It was the technical expertise of its franchise, the American Bantam, which provided the prototype for what became the widely recognized replacement of the horse.

¹³⁶ Information regarding the Percheron was obtained in an interview on August 31, 2005 with the following Cornell University veterinarians who specialize in horses: Judy L. Urban (30 years’ experience in horse surgery), Ann Townsend-Poors (20 years’ experience in horse anesthesia), and Margie Vail (10 years’ experience in horse surgery).

¹³⁷ Munro, *Jeep: From Bantam to Wrangler*, 13.

¹³⁸ *Automobiles: Jeeps*, A&E Television Networks, 1996.

¹³⁹ Rifkind, *The Jeep*, 15.

¹⁴⁰ Graham Scott, *Essential Military Jeep*, 11.

¹⁴¹ *Ibid.*, 12. Also in Schreier, “Born for Battle,” 32.



The Howie machine-gun carrier, forerunner of jeep, was built in 1937 by Captain Robert G. Howie, then an instructor at the Infantry School, Fort Benning. Steering was done by a lever.

Figure 3.2. Belly Flopper.

Source: T. Richards, Military Jeeps, 1941–45 (Brooklands Road & Track Series. Bloomfield, NJ; Cobham, Surrey: Portrayal Press; Distributed by Brooklands Book Distribution, 1985), 6.

Feminine Origins of the Jeep

The original idea for the Austin Seven was born of the need to create a vehicle designed for women just learning to drive.¹⁴² The adaptability, maneuverability, and lightness of its handling account for the emphasis on its light weight. The Austin Seven was launched at the time of the British Roads Act of 1921, a law that taxed every automobile based on its horsepower.¹⁴³ The Austin originally weighed just over 700 pounds, with an overall length of 104 inches, width of 40 inches, and maximum speed of 50 mph when fully loaded.¹⁴⁴ The small, durable Austin Seven could seat two adults in the front and a few small children in the back, or one adult sitting sideways,¹⁴⁵ although it could—and often did—carry four adults.¹⁴⁶ It was considered

¹⁴² Zita Elaine Lambert and Robert John Wyatt, Lord Austin: The Man (London: Sidgwick & Jackson, 1968), 123.

¹⁴³ John Underwood, Whatever Became of the Baby Austin? (El Monte, CA: R & L Press, 1965), 5.

¹⁴⁴ *Ibid.* See also Lambert and Wyatt, Lord Austin: The Man, 126. Lambert and Wyatt calculate the length as 105 inches.

¹⁴⁵ *Ibid.*

¹⁴⁶ Lambert and Wyatt, Lord Austin: The Man, 126.

a remarkable engineering achievement and was a huge commercial success in England, but failed miserably in the United States.

In a desperate move to save the American Bantam Car Company, the sole licensed manufacturer of the Austin Seven, Roy Evans, a well-respected automobile dealer, took ownership of the company in 1932 and faced an oversupply of 1,500 unfinished cars, with the entire production facility at a standstill.¹⁴⁷ After years of trying to revive the fledgling company, Evans approached the military in 1939, which at that time was experimenting with small, highly maneuverable utility cars such as the Belly Flopper. He provided the Pennsylvania National Guard with three Bantams for testing as scout cars, and the rest, as they say, is history.¹⁴⁸

The Pennsylvania National Guard was impressed with the performance of the Austins, and the following year, the military invited various manufacturers to bid on creating a prototype of a scout car made to military specifications. Of the 135 manufacturers the military invited, only two replied: American Bantam and Willys-Overland Motors, Inc. The American Bantam Car Company won the bid, promising to complete a pilot model within the specified forty-nine day period, a deadline large manufacturers decided they could not meet. With the exception of the weight requirement, Karl Probst of the Bantam Car Company, hired as an independent contractor, fulfilled all of the military's specifications and—with the help of Bantam's factory manager and Detroit's auto parts suppliers—delivered the prototype on time.¹⁴⁹

Approximately one month later, the Bantam Reconnaissance Command, 40 horsepower, known as the BRC 40, passed the military's grueling prototype tests in Maryland, witnessed by major manufacturers such as Ford, Chrysler, General Motors,

¹⁴⁷ Underwood, *Whatever Became of the Baby Austin?*, 418.

¹⁴⁸ Probst with Probst, "One Summer in Butler," 431.

¹⁴⁹ *Ibid.*, 433.

and Willys-Overland, who took notes on the Bantam's design. The Bantam was driven through mud two feet deep, over hills and various other types of terrain (Figures 3.3–3.5), and a cavalry general even ordered two men to see if they could lift it out of a ditch.¹⁵⁰ The weight requirement was added to ensure that the prototype could be manhandled easily like a horse.

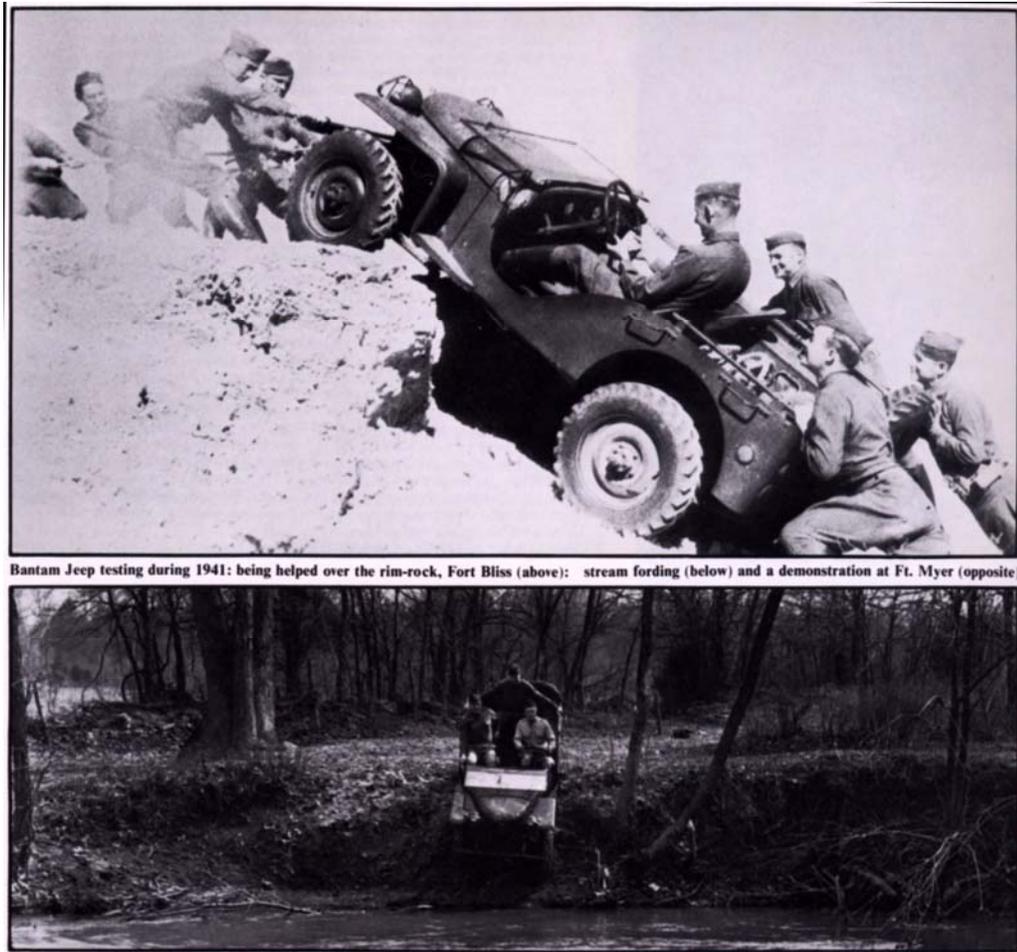


Figure 3.3. Testing the Bantam.

Source: Karl K. Probst with Charles O. Probst, "One Summer in Butler—Bantam Builds the Jeep," Automobile Quarterly 14, no. 4 (1976): 434.

¹⁵⁰ Ibid., 435–438.



Figure 3.4. The Bantam in the Mud.

Source: Karl K. Probst with Charles O. Probst, "One Summer in Butler—Bantam Builds the Jeep," Automobile Quarterly 14, no. 4 (1976): 435.



Bantam-powered by belt drive, a paddle wheel raft splashes across a river. A machine gun-toting Jeep.

Figure 3.5. The Bantam over the Hills.

Source: Karl K. Probst with Charles O. Probst, "One Summer in Butler—Bantam Builds the Jeep," Automobile Quarterly 14, no. 4 (1976): 437.

After the Bantam passed the required vehicle tests, the head of the inspection team, Major Lawes, announced his verdict:

I have driven every unit the services have purchased for the last twenty years. I can judge them in fifteen minutes. This vehicle is going to be absolutely outstanding. I believe this unit will make history.¹⁵¹

A lieutenant described the reaction of the 6th Cavalry, which was given eight Bantam cars for testing.

Within the short span of the past four months, the entire Army has become Bantam conscious. The novelty of these small cars has captured the fancy of all the arms and bids fair to effect major changes in our ideas on cross-country mobility.¹⁵²

The Bantam tested weighed 2,200 pounds, far more than the 1,275 pounds of the original specifications. However, the cavalry found that the Bantam was able to perform all tasks typically expected of a horse and dubbed it the new “Iron Pony.”¹⁵³

Several months earlier, the commanding officer of the 6th Cavalry had personally subjected the Bantams to “every conceivable test. From sticking them in mud holes to towing a 37-mm. gun,” and the iron pony proved able to perform satisfactorily in these tests.¹⁵⁴ The 6th Cavalry later tested the eight Bantams more extensively, using the plan outlined by their commanding officer. They found that the Bantam, like the horse, could operate cross-country with a gun in tow.¹⁵⁵ A lieutenant described in detail the performance of the Bantams:

The field tests themselves consisted of putting the car through mud and water, over rough ground, through brush, up and down banks, and over every adverse

¹⁵¹ Probst with Probst, “One Summer in Butler,” 436.

¹⁵² Lieutenant George M. White, “Cavalry’s Iron Pony,” The Cavalry Journal 50, no. 2 (March–April 1941): 85.

¹⁵³ *Ibid.*, 88.

¹⁵⁴ Lieutenant Colonel John A. Considine, “Sixth Cavalry-(Horse Mechanized) Fort Oglethorpe, Ga.” The Cavalry Journal 50, (January–February 1941): 87.

¹⁵⁵ White, “Cavalry’s Iron Pony,” 86.

type of ground a vehicle could be expected to traverse—and over a good many that no other type could traverse. Through these tests, it has been proved, beyond any reasonable doubt, that these little cars can and will do far more than even the manufacturers expected.... It has also been noticed that in the case of the Bantam, more than in any other, its ability to get out of tough spots is predicated directly on the boldness and ability of the driver.¹⁵⁶

Two goals measured by the test reflected what was foremost in the minds of the cavalry officers: the ability to traverse cross-country terrain and the importance of the driver's boldness in getting "out of tough spots." The emphasis on the driver's role in exhibiting boldness certainly harked back to Civil War days, when wars were deemed to depend upon dramatic exhibitions of offensive maneuvers by the cavalry. With the use of the Bantam, mechanized war was no longer simply a matter of operating machines; boldness in men was also perceived to play a central role in the use of the little cars, just like the principle of leading described in the 1914 cavalry manual.

The 6th Cavalry test was also primarily organizational and functional in character, with a verdict that there was "no doubt in the minds" of the members of the regiment, including the commanding officer, that the little Bantam fulfilled the requirements of an ideal cavalry car.¹⁵⁷ However, it was the 6th Cavalry that a year earlier had been described by a staff correspondent as most adamant about keeping the horse. The 6th Cavalry believed that "there is no medium which exists that excels the mounted trooper for cross country mobility under all conditions."¹⁵⁸ In other words, they believed the horse to be irreplaceable, but the field tests of the little motorcar convinced them to change their hard-line position:

¹⁵⁶ Ibid.

¹⁵⁷ Captain Bruce Palmer, "The Bantam in the Scout Car Platoon," The Cavalry Journal 50, no. 2 (March–April 1941): 89.

¹⁵⁸ Staff Correspondent, "The Sixth Cavalry in the Fourth Corps Maneuvers," The Cavalry Journal 49, no. 219 (May–June 1940): 198.

1. Reconnaissance. “The Bantam upon receiving fire, upon observing the enemy, or upon catching sight of a physical road block darts quickly under cover off the road.”¹⁵⁹ This ability to hide from the enemy but to maintain visibility satisfied the requirements of the cavalry in conducting reconnaissance missions. As mentioned by a major in the early 1930s, ideal cavalry cars should have “low visibility to the enemy—but with visibility open to the sky for the crew.”¹⁶⁰ The Bantam tested well in these types of situations. It was also deemed light enough to move across weak bridges but sturdy enough to reconnoiter on back trails.¹⁶¹
2. Noise Factor. The Bantam moved quickly and quietly.¹⁶² One of the main contentions about early motorcars, including motorcycles, was that their noise alerted enemies. Bantam cars on the roads were described to be “practically without noise.”¹⁶³
3. Supply. The Bantam could “certainly prove to be a life-saver” in transporting supplies, rations, gasoline, machine guns, and ammunition over difficult terrain, according to the examiners.¹⁶⁴ It was able to carry radios and other communications equipment, such as signal lamps and flags.¹⁶⁵

The cavalry also continued to modify and improve the Bantam to better suit its needs, for example, affixing iron rails over the headlights for protection, but the

¹⁵⁹ Palmer, “The Bantam in the Scout Car Platoon,” March–April 1941, 89.

¹⁶⁰ Phillips, “The First Motorized Cavalry,” May–June 1934, 10.

¹⁶¹ Palmer, “The Bantam in the Scout Car Platoon,” 90.

¹⁶² Ibid.

¹⁶³ Ibid.

¹⁶⁴ Ibid., 91.

¹⁶⁵ Major John Hughes Stodter, “Radio Equipment for Horse Cavalry,” *The Cavalry Journal* 50, no. 3 (May–June 1941): 68–69.

overall result was overwhelming acceptance of the vehicle by users.¹⁶⁶ The vehicle eventually produced in mass quantities by Willys and Ford did not radically differ from Bantam’s prototype or, for that matter, from the original specifications issued by the military, except perhaps for its weight.

Based on the US War Department’s technical manual, 1/4-Ton 4 X 4 Truck (Willys-Overland Model MB and Ford Model GPW), the jeep that went into final production did not significantly deviate from its original specifications, apart from a dramatic increase in weight and a slight increase in height with the windshield down (Table 3.1).

Table 3.1. Comparison of Original and Production Specifications.

Vehicle Specifications	Original Specifications	Willys MB/Ford GPW*
Performance	Four-wheel drive	Four-wheel drive
Weight	1275 lb	2453 lb
Payload	600 lb	800 lb
Wheelbase	80 inches	80 inches
Height		
- top up	64 inches	69.75inches
- top down	36 inches	52 inches
Ground Clearance	6.5 inches	8.75 inches

* From The Complete WW2 Military Jeep Manual (Hong Kong: Brooklands Books, Ltd., n.d.).

Co-opting Horse Infrastructure

The infrastructure for teaching horsemanship also began to be taken over by the new iron pony. The Cavalry School began offering motor classes soon after the Bantam passed the cavalry’s rigorous field tests. A major observed, “The Cavalry School, heart of the Cavalry service, opened a motor school, where under the central control and with the ablest personnel obtainable, motor specialists [were] trained.”¹⁶⁷ It would have been inconceivable in the 1920s for such an arrangement to occur.

¹⁶⁶ Palmer, “The Bantam in the Scout Car Platoon,” 89–91.

¹⁶⁷ Major Albert Whipple Morse, Jr., “The Cavalry School Department of Motors,” The Cavalry Journal 50, no. 3 (May–June 1941): 71.

However, with the materialization of the jeep, the horse infrastructure began to serve motor purposes in the early 1940s: driver maintenance, preventive maintenance, repairs, overhaul and rebuilding were taught.¹⁶⁸

Using the facilities of the Cavalry School, automotive education became part of cavalry curriculum. Automotive maintenance and repair were taught alongside horsemanship. No longer was motor power segregated from muscle power, as was the case during the 1920s. The procurement process, unlike the 1930s decentralized approach, became the provenance of one entity, the Ordnance Department. More important, the work routines of horse maintenance and care in the cavalry continued with automotive maintenance and repair.

By 1943, the Cavalry School included a Department of Motors, which was divided into five sections: Department Headquarters, Supply Sections, Automotive Section, Special Classes Section, and Tank Section. The Headquarters and Supply Sections taught supervision, administration, and supply, while the Automotive Section taught all matters concerning wheeled vehicles. The Special Classes Section conducted all motor instruction, primarily for officers. The Tank Section was responsible for teaching the mechanical functioning, operation, and maintenance of all cavalry-type vehicles; hence the Bantam was most likely covered under this section.¹⁶⁹ In addition, the Cavalry Replacement Training School (CRTS) trained mechanics specializing in repair and maintenance (Figures 3.6–3.7).

¹⁶⁸ Ibid.

¹⁶⁹ “The Cavalry School of 1943,” *The Cavalry Journal* 52, no. 1 (January–February, 1943): 85–86.



Figure 3.6. Military Mechanics in Training.
Source: "Training Mechanics at C.R.T.C.,"
The Cavalry Journal 52, no. 2 (March–April 1943), 76.

Training in the use of motorcars for combat was also placed at Fort Knox, Kentucky,¹⁷⁰ a traditional training ground for cavalry horses. Basic formations of the mechanized cavalry, such as the line, column, and echelon, closely resembled those of the horsed cavalry. Techniques of scouting and patrolling also remained the same as their horsed counterparts. Each crewman was responsible for his own vehicle, in much the same way a traditionally equipped cavalryman was expected to care for his own horse.

¹⁷⁰ John L. S. Daley, "From Theory to Practice: Tanks, Doctrine, and the U.S. Army, 1916–1940" (PhD diss, Kent State University, 1993), 440.



Figure 3.7. Bantams in the Cavalry School.
Source: “The Cavalry School of 1943,” The Cavalry Journal 52, no. 1
(January–February, 1943): 89.

The conventional infantryman, by contrast, was used to looking after himself only. Routines of maintenance and care in the infantry were nonexistent, which the cavalry never failed to point out whenever it sought to control the armored or mechanized forces.¹⁷¹

The repair and maintenance of motorcars became centralized through the Quartermaster Corps. The strict performance specifications of the Bantam necessitated standardization in supply parts for efficient maintenance and repairs,¹⁷² similar to the way standardization of horse behaviors was effected through intelligent training.¹⁷³

¹⁷¹ Ibid.

¹⁷² Col. Edgar S. Stayer, “The Year’s Advancement in Military Motor Transport,” The Quartermaster Review 12 (Jul–Aug 1932): 33–37.

¹⁷³ “Fundamentals of Cavalry Training Policy,” April 1921, 184.

During the postwar years, the Quartermaster Corps worked closely with the automotive industry, attending important transportation conferences to influence the development of designs and inventions.¹⁷⁴ The Quartermaster Corps was responsible for maintaining auto parts, although some responsibilities regarding technical matters overlapped with those of the Ordnance Department, which also participated in administrative activities involving the creation of the iron pony.

In terms of combat doctrines, tactics, scout techniques, patrolling, and basic formations, cavalry fundamentals remained unchanged. River crossings, for instance (Figure 3.8), were taught in horse and motor versions.

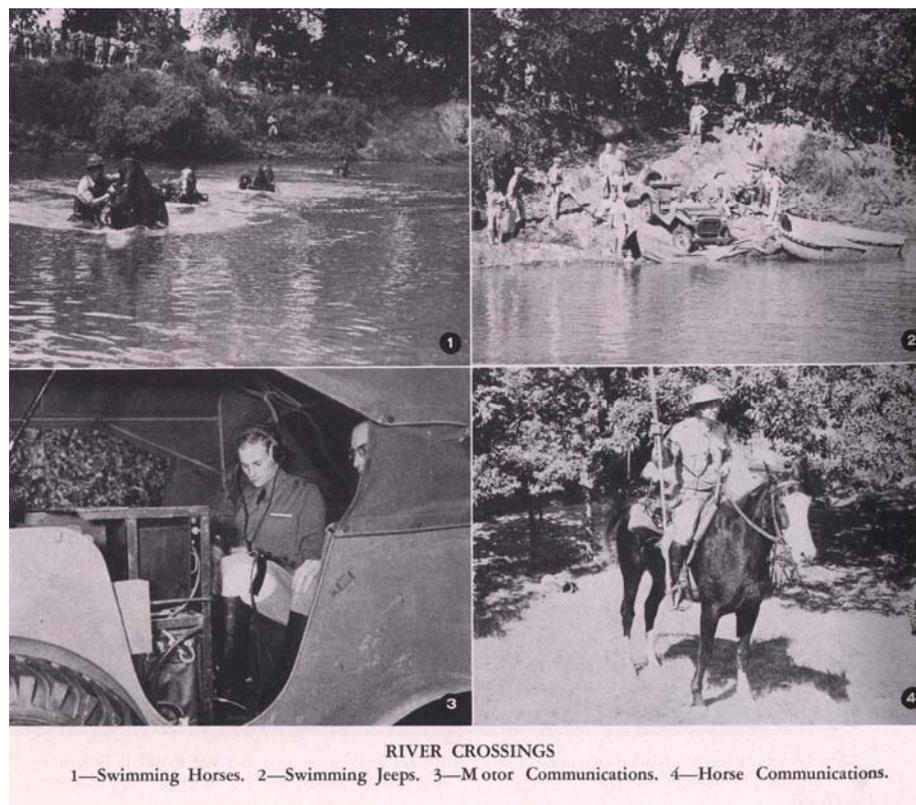


Figure 3.8. Integrating Jeeps into the Cavalry Curriculum.

Source: Lieutenants W. S. McCauley and R. M. Vance, "R.O.T.C. Graduates at the Cavalry School," *The Cavalry Journal* 51, no. 5 (September–October 1942): 76.

¹⁷⁴ E. Risch, *Quartermaster Support of the Army: A History of the Corps, 1775–1939*, CMH Pub, Vol. 70-35 (Washington, DC: Center of Military History, US Army: For sale by the Supt. of Docs., US GPO, 1989), 718.

With the Bantam it was at last possible, in the eyes of soldiers, to decouple the horse from the cavalry. Motorization was no longer perceived as a threat to the cavalry way of life. The cavalry was able to maintain mobility as a combat strategy, and the Bantam served as a platform upon which the traditional cavalry continued to exhibit aggressiveness and prompt action. The Bantam, lightweight with cross-country capability, provided functionalities similar to those of the horse, which earlier, commercial versions of the motorcar had been unable to replicate.

The presence of the horse came to be expressed through the “iron pony,” which allowed the cavalry to maintain its combat identity of mobility and boldness. The many objections to the motorcar, which mirrored the arguments for keeping the horse, had been specifically addressed in the technical specifications and performance requirements of the Bantam. Motorization no longer required a redefinition of the cavalry’s core identity as a combat arm. The sustainability and rapid diffusion of the Bantam, soon to be called the jeep,¹⁷⁵ may be partly explained by its having taken over

¹⁷⁵ The Federal Trade Commission ruled that the name “jeep” was first used on a vehicle by an unidentified soldier or noncommissioned officer after the newspaper comic strip character (Federal Trade Commission Decisions 44, 572, cited in Frederic L. Coldwell, Selling the All-American Wonder: The World War II Consumer Advertising of Willys-Overland Motors, Inc. [Lakeville, MN: USM Inc, 1996], 98). The term “jeep” came from a Popeye comic strip published in the Daily Times on April 22, 1940. The versatile dog Eugene uttered “jeep, jeep, jeep,” and a sergeant named James T. O’Brien liked the term and painted it on his vehicle. Several weeks later the name became common in the military (Ray Cowdery and Merrill Madsen, All-American Wonder: Information Regarding the History, Production, Features and the Restoration of Military Jeeps, 1941–1945 [Rogers, MN: Victory Publishing Limited, 1993, 43]). There is, however, a predominant misconception that the term “jeep” came from the abbreviation “GP,” which stood for “General Purpose.” However, it appears that GP most likely came from Ford’s Parts Numbering System. The prefix G stood for “Government” and the prefix P stood for “80-inch wheelbase Reconnaissance Car.” Typically, Ford would use the first digit of the prefix to indicate the year the part was made, i.e., prefixes were “8,” for 1938, or “9,” for 1939, etc. In the case of the jeep, Ford used a generic letter G, most likely to indicate that it was a government model since its specifications were standardized and did not change as often as commercial cars, whose models varied on a yearly basis. The second prefix, which represents engine power, i.e., “1” for 85 H.P. V-8 or “2” for 60 etc., uses P to refer to the 80-inch wheelbase (Cowdery and Madsen, All-American Wonder, 21). Thus while the name “jeep” did not come from GP, and most likely came from a comic character, the Federal Trade Commission ruled that “it is impossible to state with certainty just when the name ‘Jeep’ was first applied” (Federal Trade Commission Decisions 44, 572–590, cited in Coldwell, Selling the All-American Wonder, 101). Although it was decided with a fair amount of certainty that when the Washington Post published a story in March 16, 1941 about this cross-country machine and referred to it as a “jeep,” the name stuck (Probst with Probst, “One Summer in Butler,” 436).

a well-institutionalized infrastructure revolving around the horse; it may also be partly explained by the ease with which soldiers transferred practices related to animal warhorses into this new iron form.

Witnessing the Warhorse in Action: The Jeep in World War II

Indeed, the jeep in WWII was declared the replacement for the horse.¹⁷⁶ The jeep was described by army men as a “blitz buggy,” which could “scramble over rough country better than a horse.”¹⁷⁷ Many other commercial motorcars, such as the famous Model T, and even homegrown army machines such as the Belly Flopper, failed to captivate the army’s imagination. What made the jeep compelling?

The jeep’s popularity among soldiers in WWII can be partly attributed to its horse-like versatility. The jeep quickly replaced the horse in the more highly intensified combat environment. The acceptance of the jeep might not have been as immediate and widespread if its use had required fundamental changes in the soldier’s tactics, routines, and mobility. The new “warhorse” provided a platform on which the spirit of the cavalry could be carried out in modernized warfare. In fact, the GIs’ use of the jeep showed that the mechanical horse was able to carry out many of the daily tasks usually performed by the animal horse. This versatility made the jeep almost indispensable everywhere, and in this sense rendered it inseparable from the soldier.

The traditional bond between cavalymen and their horses was made manifest in the way GIs cared for their jeeps, that is, giving them names and personalities, and bestowing attention on them as if they were sentient beings. A sense of familiarity developed such that soldiers’ knowledge of their jeeps resembled the same level of familiarity typically found between cavalymen and their horses. For instance, some cavalymen, just by looking at a horse, would know if the horse was lame in the front

¹⁷⁶ W. E. Butterworth, *Soldiers on Horseback* (New York: W.W. Norton & Company, Inc., 1967), 127.

¹⁷⁷ Cowdery and Madsen, *All-American Wonder*, 46.

or back leg. Similarly, soldiers learned to know their jeeps inside out, to make Band-Aid fixes and patch-up repairs in order to cure their jeeps of damage and mechanical problems. The speed with which soldiers became skilled in using jeeps in various theatres of war indicates a seamless transfer of preexisting practices from the horse culture.

The Jeep Goes to War: The Jeep Raid as a Cavalry Raid

One of the early applications of the jeep occurred in North Africa with David Stirling, whose conception of desert raiders followed the basic principles of cavalry warfare in which shock and mobility were the key elements of an attack. Stirling's jeep raids blew up pipelines, attacked airfields, destroyed transport and fuel tankers, and essentially inflicted mayhem on German general Erwin Rommel, known as the "Desert Fox." As Rommel described the situation, "These Commandos, working from Kufra, and the Qattara depression, sometimes operated right up into Cyrenaica, where they caused considerable havoc and seriously disquieted the Italians"¹⁷⁸ (see Figure 3.9).

¹⁷⁸ Erwin Rommel and Basil Henry Liddell Hart, ed., The Rommel Papers, with the assistance of Lucie-Maria Rommel, Manfred Rommel, and General Fritz Bayerlein, translated by Paul Findlay, 1st American ed. (New York: Harcourt, Brace and Company, 1953), 292. Kufra Oasis is some 500 miles south of Tobruk, deep in the Sahara Desert (see Figure 3.9).

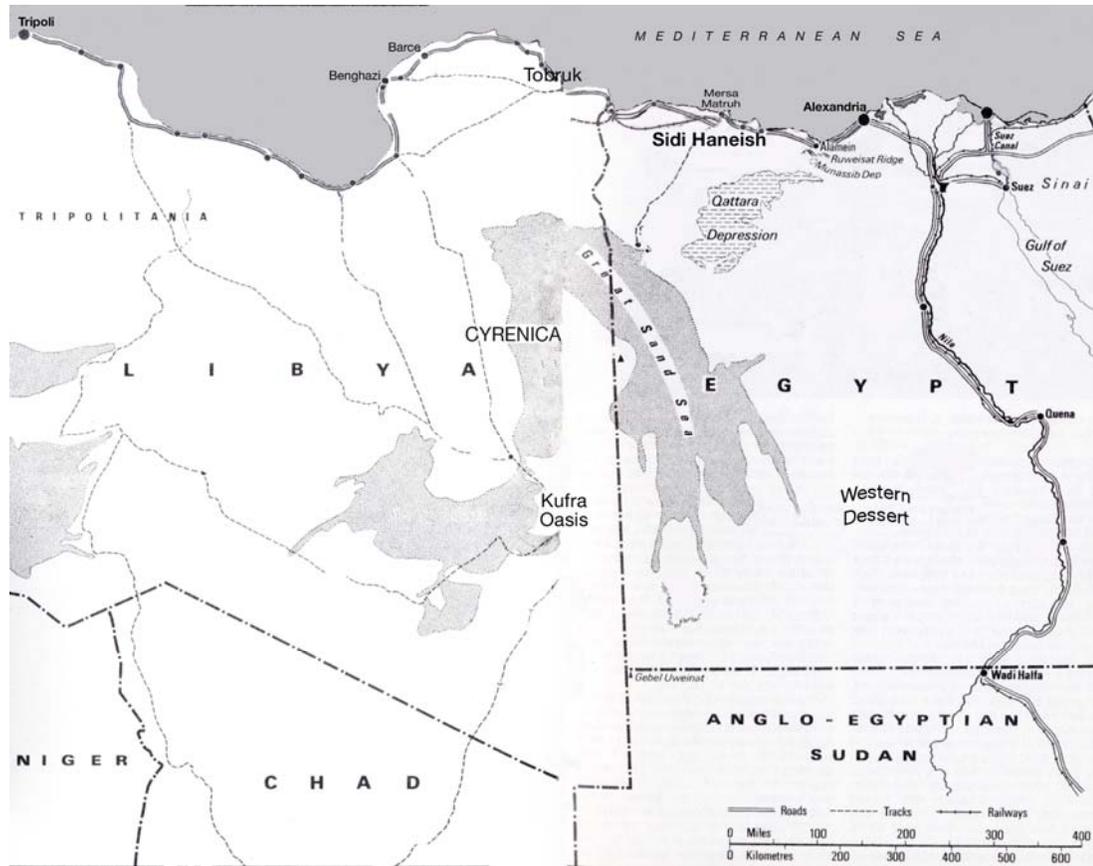


Figure 3.9. Stirling's Raiding Areas.

Source: Modified map version of Arthur Swinson, *The Raiders: Desert Strike Force* (New York: Ballantine Books Inc., 1968), 88–89.

In a single week, Stirling's highly trained 21-man team destroyed 61 planes and at least 30 vehicles without suffering any significant casualties.¹⁷⁹ Stirling's jeep raid, though unconventional for the English army,¹⁸⁰ resembled a cavalry-style attack as described in the 1914 Cavalry Service Regulations manual:

The object of a raid, in the general case, is to strike the hostile army in the arteries upon which it depends for the flow of ammunition, reinforcements, food and supplies of all kinds indispensable to its efficiency.¹⁸¹

¹⁷⁹ Cowles, *The Phantom Major*, 71.

¹⁸⁰ The traditional British commando unit, the Brigade of Guards, was large, typically consisting of about 200 men. This ponderous unit would approach German targets from the Mediterranean Sea, which allowed their presence to be given away even before they reached the North African coastline.

¹⁸¹ Cavalry Service Regulations, 1914, 260.

The most spectacular example of this type of raid in Stirling's portfolio was conducted in July 1942. The target was the airfield in Sidi Haneish, located on the Egyptian coastline less than a hundred miles west of El Alamein. This airfield was Rommel's major staging area, where planes constantly arrived at and departed from North Africa. Thus, it was perpetually full of aircraft, including badly needed transport carriers.

The Jeep-Cavalry Formation

Eighteen jeeps took part in the Sidi Haneish raid. The jeeps formed a double-line column which advanced between two rows of planes with their guns firing outwards. One column of jeeps would destroy one row of planes. Stirling would lead the group, driving at the tip of the arrowhead, with the navigator right behind him. Stirling diagrammed his jeep formation as follows (Figure 3.10):

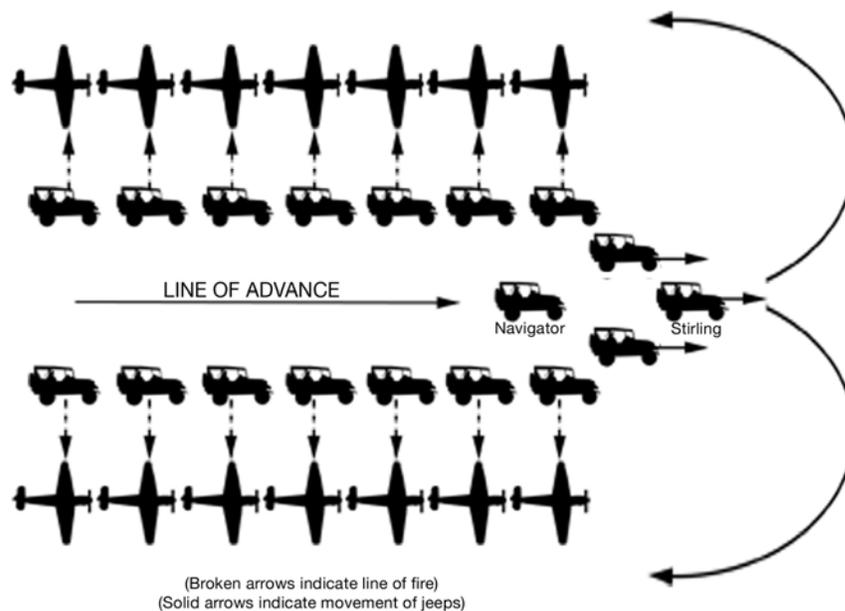


Figure 3.10. Attack Formation.

Source: Basic diagram from Virginia Cowles, *The Phantom Major: the Story of David Stirling and His Desert Command* (New York: Harper & Brothers Publishers, 1958).

Modifications by Imes Chiu. Technical illustration by Jackie Sherman.

The “jeep raid” formation Stirling popularized bore a striking resemblance to the two-column habitual formation illustrated in the Cavalry Drill Regulations manual of 1916.¹⁸² The typical double-column formation of a cavalry also placed its senior noncommissioned officer at the arrowhead leading the two columns about three yards ahead of the group. A two-yard distance was typically maintained between two cavalry columns (Figure 3.11).¹⁸³

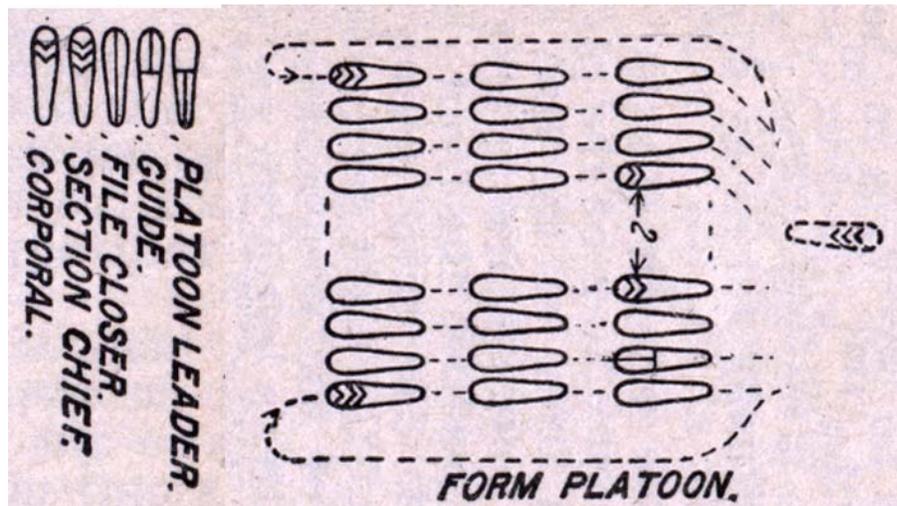


Figure 3.11. 1916 Two-Column Cavalry Formation.
 Source: Detail from Cavalry Drill Regulations, 1916 (Washington, DC: GPO, 1917), 198.

According to Stirling’s plan, the jeeps would be about five yards apart. All jeeps, except for that of the navigator, would be equipped with a driver and two gunners; each gunner would handle two Vickers guns, each of which was capable of firing a thousand rounds per minute. The first gunner would be in front with the two guns mounted before the driver, while the other gunner would be in the back handling the other two guns.

The jeeps kept in perfect formation during the attack, circled around, and hit other planes on the outskirts of the field. Moments later, the jeeps disappeared into the

¹⁸² Cavalry Drill Regulations, 1916 (Washington, DC: GPO, 1917), 196–199.

¹⁸³ *Ibid.*, 196–198; 224–225.

dark desert before the Germans could respond. Each jeep took a different path toward a common rendezvous point. The Sidi Hanesh raid destroyed or damaged about 40 German aircraft and several tents and station buildings.¹⁸⁴ Stirling's spectacular jeep raid bore the qualities of a successful cavalry raid.

The command must move rapidly and secretly. As a raiding force has no communications it is free to move in any direction. It should avoid serious combat except when necessary to accomplish its object or cut its way out. As far as possible, the enemy should be kept in ignorance of the position of the main body of the raiding force and of its destination and object of attack, and efforts should be made to deceive him as to future movements, especially as to the route of return.¹⁸⁵

The similarity between the desert raiders' attack strategy and traditional cavalry warfare strategy, including the striking resemblance of the jeep raid formation to the cavalry's habitual two-column formation, shows that Stirling's approach was not completely new in concept, although it has often been presented as such. The jeep certainly proved its cross-country capability in the trackless deserts of North Africa. In fact, while no direct relation has been established, Willys-Overland, one of the two primary manufacturers of the jeep, called its primary model in the 1940s the "Phantom MB," which correlated interestingly with Stirling's sensational use of the jeep in North Africa.

The Jeep: An All-American Wonder

The jeep was celebrated as "the most universally popular vehicle in the war; it was the one the Germans most liked to capture for day-to-day use."¹⁸⁶ General Dwight D. Eisenhower stated that senior officers considered the bulldozer, the jeep, the 2 1/2-ton truck, and the C-47 airplane as equipment vital to their success in Africa and

¹⁸⁴ Swinson, *The Raiders: Desert Strike Force*, 116.

¹⁸⁵ *Cavalry Service Regulations, 1914*, 261.

¹⁸⁶ Lee Kennett, *GI: The American Soldier in World War II* (New York: Charles Scribner's Sons, 1987), 107.

Europe.¹⁸⁷ General George C. Marshall considered the jeep the greatest contribution of the United States to modern warfare, while General Courtney Hodges described it as the “most useful motor vehicle we’ve ever had.”¹⁸⁸ Ernie Pyle, the famous war correspondent embedded in the front lines, stated it differently: “Good Lord, I do not think we could continue the war without the jeep. It does everything. It goes everywhere.... The jeep is a divine instrument of wartime locomotion.”¹⁸⁹

The jeep’s versatility was immediately recognized during the war, even by Axis troops, who were known to capture jeeps whenever possible. The jeep’s numerous applications included the following: ambulance to haul wounded men from the front lines, as it worked better than a regular ambulance because of its low silhouette; ground weapon, particularly when mounted with machine guns, because of its maneuverability and mobility on the battlefield; weapons carrier; smoke-screen spreader, because of its ability to sprint across various terrain; plow for digging ditches to lay underground cables; tow truck to move smashed planes from bomb-pocked airfields; portable power-plant for aircraft searchlights; mobile dump truck to fix airfields; field radio car; field telephone exchange; mobile antiaircraft unit; fuel and water supply car; fire fighting unit; mobile air compressor, snow plow; railroad car when mounted with steel wheels, with the ability to pull as much as 52 tons of cargo; a converted altar used by priests to conduct mass.¹⁹⁰

The versatility of the jeep endeared it even to those not on the front lines. Similar to the way horses had been used across a wide spectrum of social classes, the

¹⁸⁷ Dwight D. Eisenhower, Crusade in Europe (New York: Doubleday and Company, Inc., 1948), 163–164.

¹⁸⁸ Lyman M. Nash, “The True History of the Ugly,” The American Legion Magazine (February 1967) appearing in Military Jeeps 1941–1945 (Hong Kong: Brooklands Book Distribution Ltd.), 48.

¹⁸⁹ D. Colt Denfeld and M. Fry, The Indestructible Jeep, 126. Also in The Unstoppable Soldier, Global Television Network, LTD, 1996.

¹⁹⁰ See examples shown in the films The Unstoppable Soldier, and Automobiles: Jeeps, A&E Television Networks, 1996. Also, see Cowdery and Madsen, All-American Wonder, 46–51; Denfeld and Fry, The Indestructible Jeep, 6–16, 72–73, 86–87, 112–145; Nash, “The True History of the Ugly,” 48; A. Wade Well, Hail to the Jeep (New York: Harper & Brothers, 1946), 1–7; R. M. Clarke, Jeep Collection No. 1 (Hong Kong: Brooklands Book Distribution Ltd., n.d.).

jeep was associated with people from all ranks and walks of life; from lowly infantrymen to various high-ranking dignitaries, such as presidents and prime ministers like Franklin Roosevelt and Winston Churchill; royalty such as King George and Queen Elizabeth; high-ranking military officers, such as various commanders-in-chief and generals; and even Hollywood celebrities.¹⁹¹ The fervent horse advocate General George S. Patton had a 1944 Ford Jeep custom-made to his liking.¹⁹² One general who spent a significant amount of time on the front lines had been known to ride in a jeep for five to eight hours a day, insisting that, just like the Model T, the jeep was good for the liver.¹⁹³

The “Four Jills in a Jeep” project, later turned into a film, further popularized the jeep. The War Department commissioned four female actresses to tour England, Ireland, and Africa in a jeep to perform for the troops.¹⁹⁴ General Marshall commented that this group of four entertainers was a huge success. Marshall suggested that in the future, perhaps two entertainers could be sent to front lines, and specifically mentioned transporting them to various ground units using “a single jeep.”¹⁹⁵ In many ways, the jeep served as a social equalizer because no matter what station in life people came from, they liked being seen riding in a jeep. However, the best known companion of the jeep was the American GI.

The GI and the Jeep

The motorized divisions of the United States Army in WWII were designed to be a hybrid of armored and infantry divisions, which, among other motorized vehicles

¹⁹¹ See films *The Unstoppable Soldier* and *Automobiles: Jeeps*.

¹⁹² Well, *Hail to the Jeep*, 43–46; Denfeld and Fry, *The Indestructible Jeep*, 73.

¹⁹³ Ernie Pyle, *Brave Men* (New York: Grosset & Dunlap, 1945), 211.

¹⁹⁴ Carole Landis, *Four Jills in a Jeep* (New York: Random House, 1942), vii–5.

¹⁹⁵ George C. Marshall, Larry I. Bland, and Sharon Ritenour Stevens, *The Papers of George Catlett Marshall* (Baltimore: Johns Hopkins University Press, 1981), 575.

such as tanks and modern weaponry, included jeeps.¹⁹⁶ Numerous stories about the inseparability of the GI from his jeep proliferated during the war. In a frequently cited and possibly apocryphal story related to the jeep, a watchman, usually identified as a Frenchman, was guarding his post at night when he suddenly heard a group of soldiers approaching on foot. He propped his machine gun to position and asked them to identify themselves. One of the members of the group replied that they were Americans. Without a moment's hesitation, the guard shot them all to death.

Later, the dead men were identified as German infiltration troops disguised in American uniforms. When asked how he knew they were Germans, the watchman replied triumphantly, "That's easy! Americans, they come in jeeps!"¹⁹⁷ This story has been recounted in many different versions in a wide range of popular books written about the jeep. The inseparability of the GI from his jeep was reminiscent of the inseparability of the cavalryman from his horse.

The jeep has been described as such a constant companion of the GI that the identity of the American soldier became inseparable from the jeep,¹⁹⁸ similar to the way the cavalryman was inextricably associated with the horse. This emotional attachment has been depicted in many different GI stories, particularly along the lines of soldiers crying over their shot-up jeeps and simply refusing to accept a replacement.¹⁹⁹ Similar to the way the horse became inextricable from the cavalryman and the cavalry as a whole, the jeep came to represent America and the American soldier. One of the classic images of WWII is the cartoon by Bill Mauldin of an old-time cavalryman shooting his broken-down jeep as one would shoot a dying horse (Figure 3.12).

¹⁹⁶ Mildred Hanson Gillie, Forging the Thunderbolt, a History of the Development of the Armored Force (Harrisburg: The Military Service Publishing Company, 1947), 219.

¹⁹⁷ Well, Hail to the Jeep, 2-3; Denfeld and Fry, The Indestructible Jeep, 129.

¹⁹⁸ Denfeld and Fry, The Indestructible Jeep, 129.

¹⁹⁹ Well, Hail to the Jeep, 4.



Figure 3.12. Cartoon.

Source: Bill Mauldin, *Up Front* (Cleveland: The World Publishing Company, 1946), 114.
Copyright 1942 by Bill Mauldin. Reprinted courtesy of the William Mauldin Estate.

This scene resembled a story by Ernie Pyle, who recounted a sergeant named Buck, a cowboy from Missouri Valley, Iowa, who loved animals. When Buck saw a

mule crying in pain because of a bad shell wound, he took his .45 and put a bullet through the mule's head and said, "I wouldn't have shot him except he was hurtin' so."²⁰⁰

Another form of emotional expression came in the form of assurances, as a soldier confessed in WWII, that when new supplies of the "inevitable jeeps" would arrive together with other supplies, the soldiers felt more secure.²⁰¹ Jeeps brought new supplies of water and C-rations²⁰² in Africa every night.²⁰³ Jeeps also brought the much-awaited mail from home.²⁰⁴ The attachment of the GIs to their jeeps was such that they began to give them proper names. Bill Mauldin, a decorated war hero himself, referred to his jeep as a person with its own personality and idiosyncrasies:

Two hundred miles is a long way for a jeep, even such a jeep as my pampered and well-manicured "Jeanie," who had covered more than ten thousand miles of Anzio, Italy, and France. The ordnance people called her the most neurotic jeep in Europe. But they cleaned out the carbon, ground the valves, and adjusted the carburetor. In spite of all this tender care, Jeanie developed ignition trouble on the way north and I had to stop every few miles in a pouring rain and get out and get under. After the first one hundred miles I was very glad that mud had obliterated the name "Jeanie" on the jeep's sides because I was swearing at the car in a way that would have crisped her namesake's lovely ears.²⁰⁵

Ernie Pyle wrote that it was customary throughout the army for soldiers to paint names on their vehicles. These were often girls' names, such as Suzy,²⁰⁶ but some jeeps were called "Hitler's Menace" or "Invasion Blues," and one was named

²⁰⁰ Pyle, Brave Men, 134.

²⁰¹ Jim Lucas, "Occupation of the Russells," in The United States Marine Corps in World War II, ed. S. E. Smith (New York: Random House, 1969), 364.

²⁰² The Field Ration "C" consisted of three 12-ounce cans of ready-to-eat meals designated M-Units, and three cans, each containing bread, coffee, sugar and chocolate, known as B-Units. One meat meal or M-Unit, was roast beef hash; one was beef stew, and the third was a meat (part pork) and bean mixture. See "Editor's Mail," The Cavalry Journal 50, no. 3 (May-June 1941): 46.

²⁰³ Ernie Pyle and David Nichols, ed., Ernie's War: The Best of Ernie Pyle's World War II Dispatches (New York: Random House, 1986), 111.

²⁰⁴ James Tobin, Ernie Pyle's War: America's Eyewitness to World War II (New York: The Free Press, 1997), 94.

²⁰⁵ Bill Mauldin, Up Front (Cleveland: The World Publishing Company, 1946), 212.

²⁰⁶ Bill Mauldin, Back Home (New York: William Sloane Associates, 1947), 72.

“Bientot,” which means “soon” in French.²⁰⁷ Ernie Pyle observed that although many soldiers, even marines, might be killers, they were also “just as sentimental as anybody else.”²⁰⁸

Such was the intimacy shared by soldiers with their jeeps that, just as cavalymen were expected to know their horses well, GIs were expected to know their jeeps thoroughly and to take good care of them. Ernie Pyle once recounted how a sergeant stopped a jeep in which Pyle was a passenger to ask the driver some questions. As he turned around to walk back to his own jeep, he ordered the driver to get his spare tire fixed, exclaiming, “Goddammit, why don’t you take care of your vehicle?” “Spare tire?” replied the driver. “Yes, goddammit,” the sergeant roared. “It’s flat.”

While the sergeant was talking to the driver, he discovered the flat tire merely by feeling it with the slight pressure of his hand.²⁰⁹ This level of knowledge about the jeep echoed the level of familiarity that was expected of cavalymen with regard to their horses.²¹⁰ Many soldiers did take meticulous pride in their jeeps and some kept them, as Ernie Pyle said, “as neat as a pin.”²¹¹

Indeed, as a film on the history of the jeep described it, “The average soldier forged a bond with their motorized horses.”²¹² The jeep design of the early models resembled that of a horse; it had no doors, no locks, and the ignition key was just a simple switch.²¹³ Thus a soldier would just hop in his jeep and go, as one would mount a horse, and take off.

²⁰⁷ Pyle, Brave Men, 259.

²⁰⁸ Ernie Pyle, Last Chapter (New York: Henry Holt and Company, 1945), 137.

²⁰⁹ *Ibid.*, 51.

²¹⁰ “Faith in and a Doctrine for the Cavalry Service,” written by “One of the Faithful,” The Cavalry Journal 36, no. 147 (April 1927): 227.

²¹¹ Pyle, Brave Men, 212.

²¹² Denfeld and Fry, The Indestructible Jeep, 129.

²¹³ Nash, “The True History of the Ugly,” 53; Denfeld and Fry, The Indestructible Jeep, 141.

The jeep was described as able to “scramble over rough country better than a horse. Cross streams. Climb rocky terrain. Beat down barbed wire entanglements. Dodge through forests. Hit more than 60 miles an hour on any solid road.”²¹⁴ The jeep mirrored the description of an “iron horse” in the cavalry’s imagination:

“Iron horses” must be handy, able to turn and reverse in narrow lanes and other small spaces, and to negotiate obstacles; they must be capable of accelerating quickly, as well as moving fast, and must possess the quality of reliability.²¹⁵

Indeed, the jeep in actual combat conditions had become inseparable from American GIs, whose close bond with their mechanical horses had come to resemble those with “flesh and blood.” With the jeep, mobility as a combat strategy became associated with a mechanical medium.

Conclusion

The jeep resurrected through mechanical means the spirit of the horse and the cavalry. Even in a hierarchical setting such as the military, the implementation of a new technological mechanism required persuasive measures that could not be achieved by authoritarian mandates alone. The jeep came to represent the final effort of the cavalry to preserve its cultural and military heritage. In trying to maintain the integrity of its organization after years of warding off pressures to motorize, the cavalry found a way to continue through mechanical means what had been its foundation—the horse.

Motorization framed in terms of equine sensibilities moved the motorcar in the 1920s into a more central role in the 1930s. Polarization within the cavalry with regard to motorization began to dissolve as meanings associated with the horse gradually became represented in the motorcar. The striking accuracy of many cavalry officers’

²¹⁴ Cowdery and Madsen, *All-American Wonder*, 46–47.

²¹⁵ Stewart, “Mechanized Cavalry Has Come to Stay,” November–December 1938, 489.

descriptions of a successful replacement for the horse attests to the conceptualization of the jeep as something driven by practice rather than by technical considerations alone. The practices of cavalry-style leading, attacks on the enemy, and raids—essentially, the critical role of speed and mobility—drove discussions of an ideal car whose materialization came in the form of the jeep.

The jeep came to serve as the iron warhorse that allowed the cavalry to preserve its combat strategy of speed and mobility and its identity as a protector of other combat arms.²¹⁶ The cavalry specifically “bred” a motorcar designed to mimic the horse. Tested and proven to work like a horse, the jeep rapidly diffused, assuming existing infrastructures and relations built around the horse. While the immediate diffusion of the jeep could be largely attributed to its “breeding,” the embeddedness of the jeep in the battlefield emerged seamlessly as users transferred practices from an animal into an iron form.

While the first case study showed how manufacturers generated the need for a mechanical horse through advertisements, this second case study examined how users crafted a mechanical horse in an effort to preserve their military tactics and traditions in an increasingly modernizing world. In both cases, organizational survival was at stake. In the first case, manufacturers had to win over horsemen in order to breathe life into their nascent automotive industry. In the second case, the cavalry had to fight for its place in the military amidst an increasingly modernized world; as a result, it had to protect its combat strategies, which were built around the use of the horse.

Thus, in both case studies, the horse was instrumental in the diffusion of the motorcar. For manufacturers, the animal horse was a means to an end. Manufacturers had to breed an automotive industry by stealing market share from the horse industry; thus, the concept of the horse was used to promote acceptance of the motorcar. For the

²¹⁶ Cavalry Service Regulations, 1914, 9.

cavalryman, the horse was an end in itself—the use of a physical equivalent of the horse was used to preserve its concept. The cavalry had to breed a horselike machine to perpetuate its military heritage and identity. The motorcar in these two cases began at the periphery but eventually diffused at a rapid rate as a result of its association with the horse.

After the war, the jeep as a WWII army surplus vehicle in the Philippines evolved into a custom-built, elaborately ornamented passenger vehicle that came to be called the jeepney. The jeepney eventually took over and expanded the Philippine transportation system, which originally relied upon the horse. The jeepney has provided cheap and convenient transport to the Philippines masses. The final case of this three-part study will examine the diffusion of the jeep in this new, localized form.

Chapter Four

Case Three: Domesticating the Jeep: The Philippines

The jeep was designed to allow the cavalry to maintain mobility and speed at the core of its combat strategy. The image of the cavalry persisted throughout WWII despite the dramatic decrease in the use of the horse; the jeep immortalized the cavalry through mechanical means. Even today, any highly mobile army unit that uses transport, such as light armor or helicopters, has been designated as “cavalry.” The social and military values of the cavalry shaped the form and functionality of the jeep.

In this chapter, I will examine a similar phenomenon of the shaping of the jeep conducted in an entirely different setting, the Philippines after WWII. The jeep began as a peripheral object in the Philippines in two ways: first, it was a military object from a different country, and second, it was mechanical transport. Similar to the horseless carriage days at the turn of the century in the United States, the Philippines at the advent of WWII relied largely on muscle power. How did the jeep, an alien product in the eyes of the Filipinos, attain universal appeal in an environment so foreign to its origins?

The domestication of the jeep in the Philippines constitutes a third case study in understanding the transition from muscle to motor power. In order to gain an understanding of the jeep as a foreign mechanical object that attained ubiquity, it is important to get a sense of the contrast between the artifact and its environment, and how they eventually fit together.

I will use historical accounts from American expatriates to describe the context of the Philippines upon the arrival of the jeep. Many historical records were destroyed during the war, and thus accounts of everyday Filipino life tend to be documented by

foreigners.¹ While the perspectives of expatriates might be considered biased, the Americans arrived with informed eyes that had seen wars in other countries. Accounts of expatriates who had lived in the Philippines for many years express a fondness for the country, and their reminiscences sometimes sound like those of local residents.

These perspectives allow for an account that simultaneously highlights the peculiarities and familiarities of the Philippines relative to the US; after all, the jeep is a product of the West. Photographs, paintings, and observations from these travelers capture nuances that a local person might take for granted. The extensive four-volume Philippine Commission Report in 1900–1901, with transcripts of interviews conducted by the American delegates with key local leaders, proved to be a useful primary source in gleaning a sense of the state of roads, infrastructure, culture, and practices prior to the arrival of American influence.

Since the localized jeep known as the jeepney continues to be used today, I have also examined contemporary accounts and reflections of a local literary scholar, Emmanuel Torres, known for articulating the sentiments of the general public as well as those of some of the more marginal social groups in Philippine society. He specifically looked at the origins of the jeepney and discussed the mind-set of jeepney drivers during the vehicle's heyday in the 1970s. I have supplemented this account with phone interviews conducted in the Ilocano and Tagalog (Filipino) dialects with fifteen jeepney drivers currently working in the Philippines. They have worked in Manila as well as in various rural areas in Luzon, the northern island group of the Philippines. These drivers provide insights into current thinking about the jeepney and its slow descent into obsolescence.

¹ I searched the University of the Philippines and Ateneo de Manila University libraries for sources. I also used the Cornell University library system, known for its Southeast Asian studies collection (Kroch Library).

While conducting interviews on the phone may seem less effective than face-to-face interviews, in this case, phone interviews had certain advantages. When jeepney drivers were approached with a tape recorder or a survey questionnaire, they tended to shy away.² Many of them were uncomfortable with having to read and write. Tape recorders were particularly unnerving because of the long history of suppression of freedom of speech during the thirty-year Marcos regime. The phone interview setting allowed drivers to be more at ease and also prevented the problem of onlookers flocking around an interview setting.

Finally, I have traced the life stories of the pioneers and original manufacturers of the jeepney using accounts and interviews conducted by various Philippine magazine writers. The original manufacturers of the jeepney are deceased, and in the absence of books and other primary source materials on the topic, magazines provide an alternative resource. These magazines target middle class readers and, hence, provide a reasonable approximation of the types of issues and concerns that dominate mainstream thinking. Some of the articles were published transcripts of interviews.

In this chapter, I will show how the jeep's endurance can be attributed once again to its role as a mechanical surrogate for the horse. While the previous chapters discussed *why* the jeep assumed its particular form and functionality, this chapter focuses on *how* the jeep attained its universal appeal in the Philippines. The jeep evolved into a custom-built, elaborately ornamented passenger vehicle that continues to provide cheap and convenient transport to the Philippine masses today. I argue that the equine legacy of the Philippines in many ways paved the way for the ease with which a localized jeep was integrated into its socioeconomic setting.

² Local people assigned to conduct the survey and interviews reported this phenomenon. Having lived in the Philippines for more than twenty years, I found that people being singled out from their friends feel extremely uncomfortable or embarrassed.

Surplus Jeeps

After the war, the jeep's evolution took various interesting turns. The jeeps that had been used in Allied countries were prevented from being brought back to the United States. Various American manufacturers petitioned the US government to keep the market from being flooded with wartime surplus goods. Willys-Overland, the sole manufacturer of jeeps by 1945, argued that returning the jeeps to the US would hurt post-war businesses, making it difficult to generate jobs for returning GIs.³ Additionally, Willys testified before the US House of Representatives that jeeps were designed for battle and, thus, for safety reasons, would need to be professionally modified by the manufacturers for civilian use.

Consequently, most wartime jeeps were kept from being brought back to the United States and from being sold to the US general public. What happened to the surplus jeeps left in Allied countries, however, was another matter. In the interest of developing markets outside the US for spare parts and other downstream supply businesses, jeeps were left behind. The supposed concern for civilian safety in using a military designed vehicle became a superfluous issue.

The jeep in the Philippines became what the locals call a “jeepney”—a term perhaps derived from “jitney,” the five-cent fare auto that started in Los Angeles in 1914,⁴ although this association was not mentioned in any widely-cited literature on the jeepney. The jeepney replaced the *calesa*, the horse-drawn carriage used for public transport before the war. The stripped-down jeep was easily localized into an elaborately ornamented passenger vehicle used largely by the masses.

The immediate adoption of the jeep could be argued to be a necessary result of postwar conditions when it began to displace the prewar role of the horse in public

³ House, Subcommittee of the Committee on Public Buildings and Grounds, Hearings, Disposition of Surplus Property, Seventy-Eighth Congress, Second Session (Washington, DC: GPO, 1943), 137.

⁴ John Anderson Miller, Fares, Please! A Popular History of Trolleys, Horsecars, Streetcars, Buses, Elevateds, and Subways (New York: Dover Publications, Inc., 1960), 147.

transport. While the lack of transport could be argued to be a motivating factor in the rapidity of the diffusion of the Philippine jeepney, its look and feel could not be explained by necessity alone, particularly its strong association with the horse.

The Horse Legacy

A working Philippine cavalry appears to have existed as early as 1898. The Philippine cavalry put up strong resistance to the Americans as part of a four-year insurrection for independence⁵ following the American seizure of the Philippines during the Spanish-American War. No US cavalry was assigned in the Philippines in 1898, but on March 2, 1899, Congress ratified three additional cavalry units, two of which were organized in the Philippines: one squadron composed of Americans then in the Philippines and the other composed entirely of Filipinos.⁶

The Philippine cavalry unit under American supervision was perhaps organized as a countermeasure against resistance forces. On April 23, 1899, the American cavalry under Major James Franklin Bell suffered a major defeat and heavy casualties, including the death of Colonel John M. Stotsenberg, at the hands of Filipino hero General Gregorio del Pilar.⁷ The preliminary report of the Philippine Commission to the President of the United States on November 2, 1899, expressed grave concern about the Filipino resistance:

The insurgents were insolent to our guards and made persistent and continuous efforts to push them back and advance the insurgent lines farther into the city of Manila. It was a long and trying period of insult and abuse heaped upon our soldiers, with constant submission as the only means of avoiding an open

⁵ Teodoro A. Agoncillo, History of the Filipino People (Quezon City, Philippines: Garotech Publishing, 1990), 247.

⁶ Mary Lee Stubbs, Stanley Russell Connor, and US Dept. of the Army, Office of Military History, Armor-Cavalry Part II, Army Lineage Series (Washington, DC: US GPO, 1969), 29.

⁷ Agoncillo, History of the Filipino People, 219.

rupture. [...] Rumors were always prevalent that our army will be attacked at once.⁸

When the former chief of the northern province of the Philippines, Senor Angel Lopez, testified before the committee earlier that year on May 8, his repeated assurances of holding no insurgents⁹ in his area indicate the issue to be of vital concern to the colonizers.¹⁰ The committee was composed of President Shurman (in the chair), Admiral Dewey, Colonel Denby, and Professor Worcester, commissioners, and Mr. John R. MacArthur, secretary. The following is an excerpt of the inquiry between Shurman and Lopez:

Q. How do the people of Union and Ilocos [one of the northern provinces in Luzon] stand at the present time; how are they affected toward the Americans and toward the insurgents?

A. In Vigan [capital city of Ilocos Sur] there is no insurrection; there are Philippine troops, but they are not insurgent troops.

Q. Where do those troops come from?

A. They are from Vigan itself; they are recruits, new troops, reserves.¹¹

However, it was not just the troops that interested the committee. Worcester asked Lopez:

Q. Is gold found in the sand or in the rocks?

A. In the forests and in the mountains, in the rocks.

Q. Are there wild people in the mountains?

A. No.

⁸ Report of the Philippine Commission to the President, 1900, vol. 1 (Washington, DC: GPO, 1900), 174.

⁹ No insurgents were held because prisoners were shot.

¹⁰ Report of the Philippine Commission to the President, 1900, vol. 2 (Washington, DC: GPO, 1900), 71.

¹¹ *Ibid.*

Q. Can one travel on horseback through this province during those rains?

A. Well, even in time of rain you can travel on horseback or in a *calesa* or a carriage. They have got good roads.¹²

Lopez's testimony regarding the condition of Philippine roads in 1899 indicates a well-developed infrastructure even in rural areas. Lopez mentioned that even when it rained for one week continuously, the roads were passable¹³ (Figure 4.1). Horses were an integral part of Filipino daily life, such that efforts were made to create good roads purposely designed to withstand heavy monsoon rains. Horses were used to haul timber for building schools and houses¹⁴ and to haul sheaves of rice.¹⁵ The major means of transport also used what looks like a local version of a horse buggy (see Figures 4.2–4.4).



Figure 4.1. Flooded Manila Street.

Source: Report of the Philippine Commission to the President, 1900, vol. 3 (Washington, DC: GPO, 1901), Plate 16.

¹² Ibid., 75.

¹³ Ibid.

¹⁴ Report of the Philippine Commission to the President, 1900, vol. 4 (Washington, DC: GPO, 1901), 27.

¹⁵ Report of the Philippine Commission to the President, 1900, vol. 3 (Washington, DC: GPO, 1901), 40.



A

FILIPINO EQUIPAGE, COMMON IN MANILA.



B

A CARROMATA.

Figure 4.2. Horse-Drawn Carriages in the Philippines.

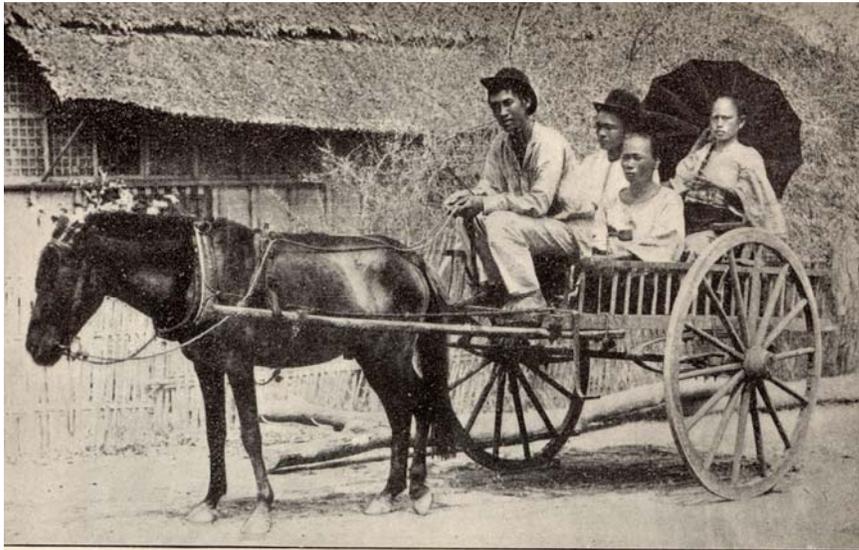
(A) Source: Report of the Philippine Commission to the President, 1900, vol. 3 (Washington, DC: GPO, 1901), Plate 45.

(B) Source: Report of the Philippine Commission to the President, 1900, vol. 3 (Washington, DC: GPO, 1901), Plate 46.



FILIPINO PONY AND CART.

A



CART COMMONLY USED BY THE NATIVES.

B

Figure 4.3. Pony-Drawn Carts.

(A) Source: Report of the Philippine Commission to the President, 1900, vol. 3 (Washington, DC: GPO, 1901), Plate 44.

(B) Source: Report of the Philippine Commission to the President, 1900, vol. 3 (Washington, DC: GPO, 1901), Plate 47.



HAULING SHEAVES OF RICE.

A



HAULING A HUGE TIMBER FOR THE SCHOOL OF MERCEDES, IN COURSE OF CONSTRUCTION (ZAMBOANGA).

B

Figure 4.4. Philippine Horses at Work.

(A) Source: Report of the Philippine Commission to the President, 1900, vol. 3 (Washington, DC: GPO, 1901), Plate 6.

(B) Source: "Public Works and Edifices," Paper No. 11, Report of the Philippine Commission to the President, 1900, vol. 4 (Washington, DC: GPO, 1901), Plate 3.

The yearly horse shows in Manila prior to WWII were popular and well respected, even among American cavalry officers. The Philippine horse tradition permeated Filipino life such that Philippine folklore and legends featured a horse creature that haunts travelers.

Tikbalang, a reverse-centaur with a horse head and a human body, dominates many Philippine folklore stories. He is known to sit and smoke a pipe on top of large trees, virtually unseen except for the smoke rising out of the trees. The *tikbalang* has the power to change shape and preys on travelers, especially at night, by giving false directions and getting them lost in the forest. Adults have been known to use *tikbalang* stories to frighten children from straying far from home and to ensure their return home by nightfall. Whereas horses have been known to find their way home, the *tikbalang* is the reverse of what the horse symbolizes in everyday life, a creature that disorients people and keeps them away from their homes.

Indeed, horses were an entrenched part of everyday life when the Americans came to the Philippines. When WWII began, the Philippine transportation system still largely depended on horses. It is interesting, however, that although the jeep became a ubiquitous transport in the form of the jeepney, it was never adopted as a farm implement, just as horses were never adopted in the Philippines for farm use.

Despite a largely agricultural economy, farm applications of the jeep never materialized. Filipinos used water buffaloes, not horses, to till the land. The pre-existing practice of using horses largely for transport continued during the years prior to the arrival of the jeep. Thus one could argue that pre-existing practices associated with the use of horses for farm applications did not exist; hence the jeep, being a mechanical equivalent of the horse, was also not used in agriculture. At the same time, it is also likely that the high water level in rice paddies rendered the water buffalo a more effective farm animal than the horse.

WWII in Manila

When James Bertram Reuter came to the Philippines as a Jesuit scholar in 1938, he observed, “Manila was quiet. Caratellas: more caratellas than cars.”¹⁶ “Caratellas,” properly spelled in Spanish as “caretellas,” and “karitelas” in the vernacular language, is the local term for horse-drawn carriages. However, a more popular term currently used would be “*calesa*,” although *carromata* (Spanish version) or *Karomata* (local term) has been used, particularly in the Ilocano dialect in the northern provinces of the Philippines. Transportation in Manila, even in the late 1930s, had not changed much from 1901 (Figure 4.5); however, the peace and quiet Reuter noted in Manila along with its bucolic carriages soon changed as WWII ensued.



THE BRIDGE OF SPAIN (MANILA).

Figure 4.5. Manila in 1900.

Source: Report of the Philippine Commission to the President, 1900, vol. 3 (Washington, DC: GPO, 1901), Plate 10.

While the Philippines appeared to have had fairly robust roads by the turn of the century, the Japanese occupation destroyed much of the transportation

¹⁶ Joseph P. McCallus, American Exiles in the Philippines, 1941–1996 (Quezon City, Philippines: New Day Publishers, 1999), 42.

infrastructure. The Japanese halted virtually all economic activities in the Philippines. The number of work animals decreased significantly. The Japanese confiscated all horses, cars, trucks, and other means of transportation.¹⁷ Toward the end of the war, highways and roads were virtually unusable. Edward Woolbright, an American entrepreneur, described the state of roads and highways in one of the cities in the southern islands of the Philippines in late October 1944:

See the Army was there... hundreds and hundreds of trucks and all kinds of vehicles... tanks...bulldozers. All of them up and down the roads... The roads were just muck. You couldn't even walk down the roads... [we had to go] in a jeep. Mudholes two or three feet deep in the town and all.¹⁸

When Manila, the capital of the Philippines, emerged from the war, mudholes were not the only problem. After massive bombing by American forces, burned bodies and large pieces of debris from buildings were strewn everywhere. Herbert Zipper, a Viennese composer and conductor who had arrived in the Philippines in 1939, described the remains of the war:

We were in Manila when liberation came, when bombs and shells tore the city apart but again set it free. We saw Manila in flames. We walked through the miles of scorched earth, through districts where a few days before homes, schools, churches and hospitals stood. We saw the ugly grimaces of war: unsupported walls, marble stairs leading nowhere, bathtubs and toilets as if suspended in mid-air, trees and shrubs charred by fire. And we smelled the stench of war. No one knows how many thousands of Manila's people perished in February 1945, their putrefied bodies unburied, strewn over dozens of square miles.¹⁹

Zipper went on to describe Manila as lacking in any "amenities of civilized life" after seeing the luxury and sophistication of a European-looking city destroyed.²⁰ There

¹⁷ Agoncillo, *History of the Filipino People*, 400.

¹⁸ McCallus, *American Exiles in the Philippines, 1941–1996*, 63.

¹⁹ Trudl Dubsky Zipper and Herbert Zipper, *Manila 1944–45: As Trudl Saw It* (Santa Monica: Crossroads School, 1994), 11.

²⁰ *Ibid.*

was no water, food, electricity, gas, telephone, or transportation system. An American historian described how Japanese soldiers hid in Manila and burned most of the infrastructure:

Perhaps the foe had thought to set one in Manila, for fires like those that ruined old Moscow in Napoleon's day broke out everywhere, and in the older sections Japanese soldiers fought to the last from house to house and block to block, while on Corregidor our paratroopers had to burn and slaughter the adversary out of his hide-outs one by one. It was a bloody, ghastly business and took a long time, the greater part of February, to clean Manila.²¹

Paul D. Perrine, an American GI who stayed in the Philippines after the war, confirmed this account, and described the devastation in Manila not only in terms of destroyed buildings but also in terms of the desolation permeating the city.

The Japanese burned several buildings and killed an estimated 100,000 civilians. Many were also killed by the U.S. military and bombing, as the fighting took place in heavily populated residential neighborhoods. So it was a sad, deplorable sight that greeted us, as we were able to look around after it was liberated. The city was actually liberated; we were able to get in and look around. I believe General Eisenhower visited here shortly after the end of World War II, and he said that of all the cities that he had seen, he thought that this was the second most destroyed city, next to Warsaw.²²

A picture that appeared in the Cavalry Journal in 1945 showed a glimpse of the devastation in Manila (Figure 4.6).

²¹ Walter Phelps Hall, Iron Out of Calvary: an Interpretative History of the Second World War (New York: D. Appleton-Century Company, Inc., 1946), 352.

²² McCallus, American Exiles in the Philippines, 1941–1996, 66.



Figure 4.6. Manila in 1945.

Source: “Cavalrymen Re-enter Manila,” *The Cavalry Journal* 54, no. 2 (March–April 1945), 44.

When Lyle A. K. Little arrived in Manila in early 1945 as part of MacArthur’s staff, he also made the comparison to Warsaw. He specifically described the devastation of the roads and transportation system, but noted the ingenuity of the people who scraped to make what he describes as “marvelous things with nothing.”

When I arrived in Manila it was in absolute shambles, second only to Warsaw as the most devastated city in World War II. All the government buildings were in ruins. There was no electricity... The streetcars were wreckage and piled one on top of the other. It was a very, very depressing sight... There were a few cars on the streets. Paved streets were nonexistent. They had turned to gravel and mud and dust. But there were a few civilian cars operating, some of them with the clumsy old charcoal burners mounted on the outside rear of the cars, which made them look very grotesque. They were burning charcoal seeking to convert it to gas—not a recommended way. They were quite ingenious these people. For all their gauntness and privation and their lack of everything, they were ingenious at improvising and did marvelous things with nothing.²³

²³ Ibid., 66–67.

This genius for improvising came into full flower with the local adaptation of surplus jeeps left in various military depots. Willys' interest in controlling US jeep market prices, coupled with the appetite of American businesses for foreign trade, conspired to bar wartime jeeps from being returned to the US. Citizens in many Allied countries, confronted with a glut of surplus jeeps, had to figure out on their own what to do with this "unsafe" military machinery.

The Auto Calesa: The Persistence of Practices

The devastation of roads and highways, together with the confiscation of virtually all means of transport by the Japanese during their occupation of the Philippines, made the durable all-terrain vehicle a ready solution to the bomb-pocked roads. The rugged US army jeep instantly became a status symbol after the car-less years of the Japanese occupation. Civilians invited to ride in one of these US army jeeps felt, according to a foreign expatriate, "elegant and superior" in the midst of the rubble.²⁴ Thus the use of converted jeeps as passenger vehicles at this time had practical as well as symbolic appeal, although its panache emerged more from the dire conditions of a war-torn country in desperate need of virtually everything.

On March 10, 1945,²⁵ almost immediately after the liberation of Manila, the wartime jeep was officially declared a "passenger automobile" by the Philippine Motor Vehicle law instituted under Executive Order No. 34 enacted by the Senate and House of Representatives of the Philippine Congress.²⁶ At this time, a motor vehicle registered to carry more than ten passengers was considered a "passenger truck" rather than a "passenger automobile."²⁷ Thus the jeep, a "passenger truck," out of sheer

²⁴ Zipper and Zipper, *Manila 1944-45: As Trudl Saw It*, 70.

²⁵ The last Japanese stronghold in Manila was eliminated on March 4, 1945. See Zipper and Zipper, *Manila 1944-45: As Trudl Saw It*, 54.

²⁶ *Motor Vehicle Law* (Manila: Bureau of Printing, 1955), 51.

²⁷ *Ibid.*, 51.

necessity emerged as an immediate solution to the problem of transportation. How the jeep was used and how it evolved, however, were far more complex.

Trudl Dubsky Zipper, an expatriate artist, described the existence of a jeep-like “baby bus” with an Austin Seven chassis that was presumably the same Austin from which the jeep originated.²⁸ The “baby bus,” also referred to as an auto calesa, or AC (literally “automated horse-drawn carriage” but the term also plays on the AC as air-conditioner because of its open body windows), closely resembled the jeep. She painted a watercolor depicting an AC, shown in Figure 4.8.

This particular vehicle was described by the artist as having appeared in the 1930s, well before the jeep was designed. Some auto calesas, according to the artist, were hidden well enough to escape the eyes of the Japanese. After the war, they emerged from hiding and were put to immediate use. I argue, however, that the artist was perhaps mistaken about the date. If auto calesa refers to the earlier Austin Seven rather than the military jeep, this would mean that any strong horse connection would be irrelevant in establishing mass appeal since the Austin Seven was not specifically designed with the horse in mind.

However, the watercolor was painted in 1945. Most likely the auto calesa was none other than a converted jeep, which would account for its functional resemblance to the early *calesas*. The vehicle’s appearance in the watercolor resembles not the elaborate pre-jeep Austin Seven of the 1930s, which seated four people, but rather the versatile jeep that had been known to pull as much as 52 tons of cargo.

Examining the watercolor, one can see that the number of passengers the AC was carrying—although probably exaggerated by the artist—was nonetheless far beyond the capacity of the Austin Seven. In addition, the design of the AC, with its

²⁸ Zipper and Zipper, *Manila 1944–45: As Trudl Saw It*, 56.

grill guard in the front, resembled the jeep more than the elaborate Austin Seven models.

These auto calesas likely evolved from the early jeeps that arrived in the Philippines at the beginning of the war, that is, at the beginning of the 1940s rather than in the 1930s.²⁹ The 26th US Cavalry, also called the Philippine Scouts, together with tanks and scout cars, was already training in the Philippines at this time, several months before the bombing of Pearl Harbor. The Cavalry trained “with the idea in mind that it was actually at war.”³⁰

Indeed, as early as July 26, 1941, George Marshall, in a secret letter to General Douglas MacArthur, established the Philippines as the Headquarters of the United States Armed Forces in the Far East,³¹ later known as the USAFFE. It was the 26th Cavalry Division that first fought the Japanese invasion force that landed on the coast of the Philippines on December 10, 1941.³² The auto calesa referred to by the watercolor artist most likely came from one of these early regiments.

Furthermore, the auto calesa was described as seating eight to ten people (although the artist admitted that the eight-to-ten capacity meant, in practice, a *minimum* of eight to ten, as is evident in the illustration), the exact benchmark established by the Philippine Motor Law of 1945 that specifically mentioned the jeep as a passenger vehicle. Indeed, a Filipino art critic and poet used the term “auto calesa” to refer specifically to converted surplus jeeps from which the jeepney originated:

²⁹ These early jeeps were most likely left behind by the US in 1942 when it withdrew from the Philippines as Japanese forces swept the nation.

³⁰ Major Arthur K. Whitehead, “With the 26th Cavalry (P.S.) in the Philippines,” The Cavalry Journal 53, no. 3 (May–June, 1944), 34.

³¹ The Papers of George Catlett Marshall, ed. Larry I. Bland, asst. ed. Sharon R. Ritenour, asst. ed. Clarence E. Wunderlin, Jr. (Baltimore: The John Hopkins University Press, 1986), 577.

³² Janusz Piekalkiewicz, The Cavalry of World War II (New York: Stein and Day Publishers, 1980), 212.

In a sense the jeepney is nothing new. It is really a motorized version of that once King of the Road, the horse-drawn calesa. In fact, as if to establish the connection, the early handcrafted short-body jeepney which seats no more than 10 (three or four on each side of the main cab section, plus two up front beside the driver) is called Auto Calesa, or AC.³³

Even later accounts of the auto calesa recognized it as none other than a basic wartime jeep, with no significant modifications to its passenger-carrying capacity. A writer described the early models of the jeepney as equivalent to the auto calesa.

Because its first models were nothing more than motorized versions of the horse-drawn *calesa*, the small jeepneys which sat three or four people on each side were called AC or Auto Calesa. (This is probably the reason why most jeepneys carry miniaturized chrome equestrian figures on their hoods—to remind us of the hardy animals they have displaced.)³⁴

The auto calesa came from an equine tradition where its use, not just its look, signified many aspects of the heritage of horse-drawn carriages. “Auto calesa” means automated horse-drawn carriage, a concept in which the horse remains integral, in contrast to the term “horseless carriage,” where the horse has been literally replaced by a motor. Thus the Philippine concept of a motorized vehicle maintained its horse element despite the demise of the physical presence of the horse.

Even in practice, people used the auto calesa in a manner similar to a horse-drawn *calesa*. The style of communal use found in the horse-drawn *calesa*, as represented in the 1945 watercolor, was replicated in the spirit of the motorized auto calesa. Observe the similarity in riding practices of the *calesa* versus auto calesa passengers (Figure 4.7 versus Figure 4.8). Note that these watercolors were drawn from similar side views by an expatriate who captured the distinctive practice of shared riding.

³³ Emmanuel Torres, *Jeepney* (Quezon City, Philippines: GCF Books, 1979), 16.

³⁴ Anjie Blardony Ureta, “The Jeepney is Still ‘King of the Road,’” *Philippine Free Press*, October 12, 1991, 38.

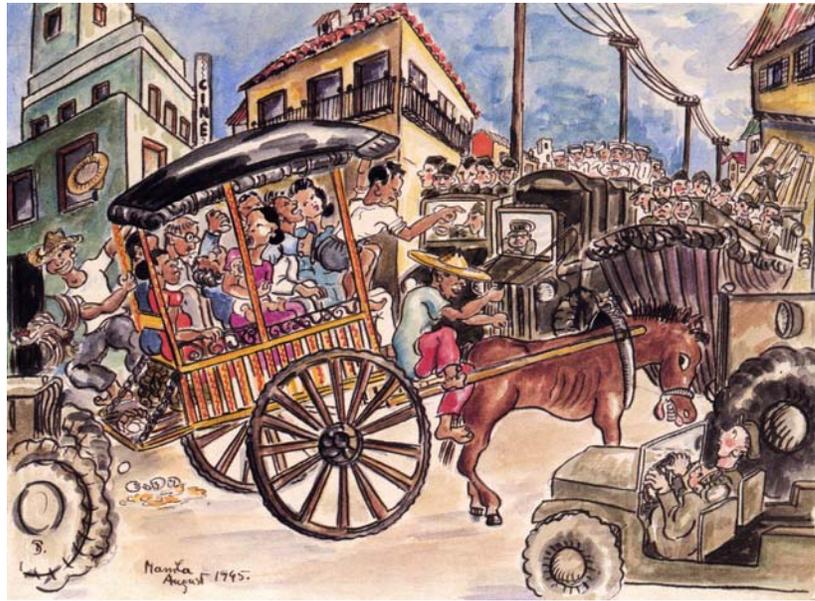


Figure 4.7. Kalesa.

Source: “The Carretela,” by Trudl Dubsy Zipper. From Trudl Dubsy Zipper and Herbert Zipper, Manila 1944–45: As Trudl Saw It (Santa Monica: Crossroads School, 1994), 77. Reprinted with permission from the Crossroads School.

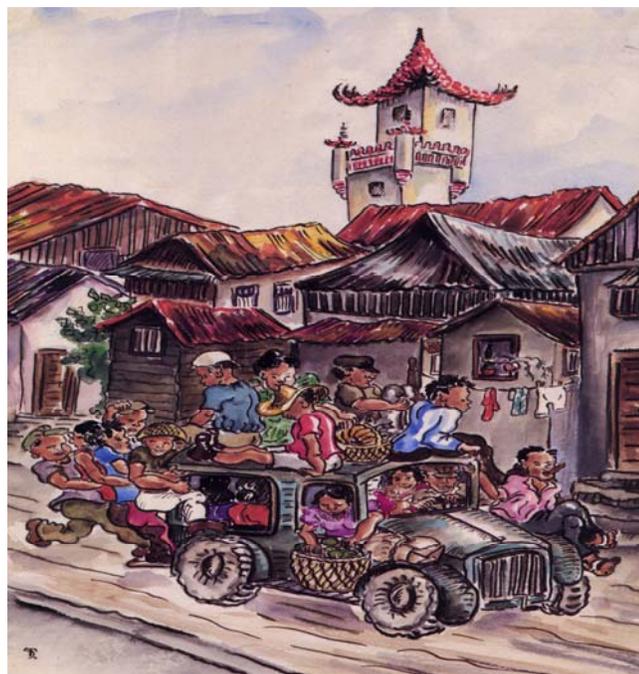


Figure 4.8. Auto Calesa.

Source: “Auto Calesa,” by Trudl Dubsy Zipper. From Trudl Dubsy Zipper and Herbert Zipper, Manila 1944–45: As Trudl Saw It (Santa Monica: Crossroads School, 1994), 59. Reprinted with permission from the Crossroads School.

As the watercolors illustrate, the way passengers rode in the auto calesa closely parallels the manner in which the original *calesa* was used. The sardine-packed communal seating of the *calesa* was simply transferred to the AC. The method of payment also followed the honor system of the horse-drawn *calesa*, by which passengers ride first and pay after.³⁵ Jeepneys later continued the tradition.

When the rear of the AC was extended to accommodate a greater number of passengers, the commercialization of what would become known as the jeepney began. The transformation of the auto calesa into the jeepney was described as follows:

It [auto calesa] differs from its later development, the assembly-plant type with body extended to accommodate more passengers, from 14 to 18, including the two up front, known as the Public Utility Jeepney, or PUJ.³⁶

According to this writer, passenger capacity seems to determine the difference between an AC and a jeepney. Nevertheless, the practice of cramming in as many people and as much luggage as possible remained in force regardless of the means of transport.

The sheer lack of basic necessities in the aftermath of war made the wartime surplus jeeps an attractive, immediate solution to the problem of transportation. The motivation of American businesses to develop foreign trade also encouraged the use of US-made machinery and goods. Eddie Woolbright, an American entrepreneur who arrived in the Philippines in 1944, described his opening of a spare parts store in the southern part of the Philippines: “We could do anything the Filipinos could do: we could buy, sell, put up a business. So it was a great life.”³⁷ Parity rights were instituted in 1946 by the US as a condition of Philippine independence: American citizens had

³⁵ Jose C. Kwe, “How the LRT Holds Up to the Philippine Jeepney,” WHO (Manila), January 10, 1982, 15.

³⁶ Torres, Jeepney, 16.

³⁷ McCallus, American Exiles in the Philippines, 1941–1996, 71–72.

the same rights as Filipino citizens; that is, they could live in the Philippines, do business, and exploit the country's natural resources.³⁸ It was initially difficult for Filipinos to compete with Americans in the war-torn economy.

The wartime jeep, with its ease of maintenance and ready availability of spare parts, increasingly offered a permanent solution to Philippine transportation problems. Furthermore, local adaptation made the jeep a part of the Philippine landscape. While the use of converted jeeps as a form of mechanized horse-drawn carriage may appear to have simply occurred, stories abound about who actually conceived the idea. As was the case with the story of the jeep in the US, the attribution of the jeepney's origins to one individual will perhaps continue to be a matter of contention.

The Jeepney Kings: The Legacy of the Horse

Filipino scholars agree that the jeepney originated from the surplus wartime jeeps left behind by the US military.³⁹ However, similar to the origin of the jeep, many claims have been made about who first devised the concept. A group of Filipino inventors recognized Clodualdo (Clod) Delfino, a bandleader and composer of popular music, as the first person to come up with the idea.⁴⁰ He was out of work after the war and decided to convert one of the leftover wartime jeeps into a passenger vehicle. The jeep at that time had a canvas top. Delfino provided the initial sketches of the "first" jeepney (Figure 4.9), which for all practical purposes resembles Trudl's auto calesa (Figure 4.8).

³⁸ Ibid. Also, Jose S. Arcilla, S. J., Recent Philippine History, 1898–1960 (Manila: Ateneo de Manila University Office of Research and Publications, 1997), 180.

³⁹ Torres, Jeepney, 15. Also in Lamberto E. Antonio, "Pambihirang Sasakyan, May Lulang Kasaysayan," Observer, January 3, 1982, 13; Valerio Nofuente, "The Jeepney Vehicle As Art," The Philippines, 1983, 38–40; Nestor Torre, Jr., "Jeepney Soul," The Philippines, 1983, 48.

⁴⁰ Torres, Jeepney, 36–37; Randy V. Urlanda, "Jeep-Making: Imus' Sunshine Industry," Philippine Panorama, September 21, 1997, 12; "The Jeepney—A Remarkable Vehicle of Philippine Folk Art," Philippine Hotel, 1971, 19; Raymond J. de Souza, "View from a Manila Jeepney," Center for Research and Communication (CRC) Staff Memos (Manila), 1995, no. 12, 1; Ureta, "The Jeepney is Still 'King of the Road,'" 38; Randy V. Urlanda, "Jeep and Jeepney Assemblers Cooperative," Philippine Panorama, April 24, 1994, 10.

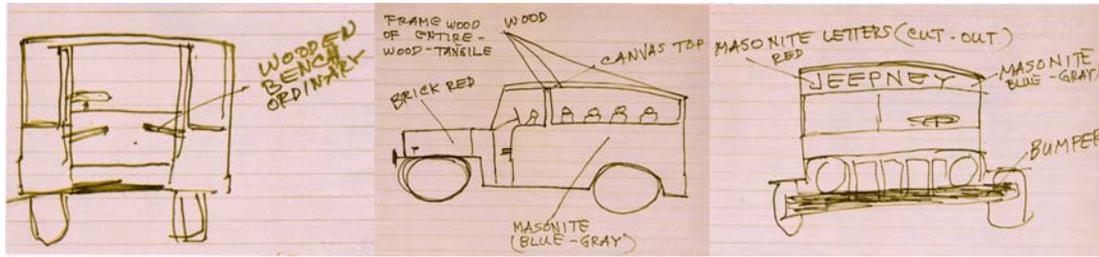


Figure 4.9. Sketch of the “First” Jeepney.

Source: Emmanuel Torres, Jeepney (Quezon City, Philippines: GCF Books, 1979), 39.

Delfino displayed the name “jeepney” on his windshield. Just as the name “jeep” became commonplace in the military because a sergeant supposedly painted the name on his vehicle,⁴¹ the “jeepney” name also stuck throughout the following decades, reportedly as a result of Delfino’s initiative. Delfino quit after six months when the entertainment industry began to revive. He reestablished his band and sold his jeepney in 1946. By this time, numerous jeepneys offered similar transportation services.⁴²

Whether Delfino indeed invented the jeepney concept requires far more convincing evidence than the personal testimonies of a handful of people. Certainly the use of auto calesas appears to have been well underway immediately after the war—and possibly even earlier. The commercialization of the jeepney, however, is a matter of less contention. It has consistently been attributed to two pioneers, both former carriage factory workers. Just as carriage craftsmen in the first decade of the century played a critical role in the US auto industry, these former carriage factory workers, soon to become manufacturers themselves, created sustained mass appeal for the jeep by bringing the flair and flamboyance of the *calesa* to the jeepney.

⁴¹ Ray Cowdery and Merrill Madsen, All-American Wonder: Information Regarding The History, Production, Features and the Restoration of Military Jeeps, 1941–1945 (Rogers, MN: Victory Publishing Limited, 1993), 43.

⁴² Torres, Jeepney, 40. Also in Bo Bigkislahi, “Jeepney: Cacophony, Color, Culture,” Sunday Inquirer Magazine (Manila), March 29, 1992, 12.

The local adaptation of wartime surplus jeeps in the Philippines occurred at the grassroots level. Anastacio Francisco was born to a poor farm family and went to Manila in search of a better life. He began as an apprentice painter and was hired to work at the Mata Carriage Factory, where he met Leonardo Sarao, the second jeepney pioneer.⁴³ Together at the carriage factory, Francisco and Sarao worked as a team: Sarao lathed the wooden and metal parts of the carriages, while Francisco painted them. This background in carriage building later influenced the many expressions of equine culture found in jeepneys, similar to the way in which early horseless carriages in the United States came to be transformed by the coach builders from their horse culture.

The commercialization of the jeepney—namely, the building of assembly-type jeepneys as opposed to the conversion of wartime surplus jeeps—began around 1947 when Francisco left the carriage factory to establish his own paint shop. A year later, most of the jeepneys and trucks roaming the streets of Manila were his “customers.”⁴⁴ By this time, the jeepney began to evolve as a viable, permanent solution to the transportation needs of the city rather than a mere stopgap. Significant modifications to the short body of the jeep began. The rear portion of the wartime “passenger truck” was elongated to accommodate more passengers. The canvas top was replaced by an aluminum or iron roof to protect passengers from the elements. Although no two jeepneys were alike, a rough image of the transformation is shown in the following diagrams (Figure 4.10).

⁴³ Jarius Y. Bondoc, “The Jeepney Kings,” *Observer* (Manila), January 3, 1982, 11–12.

⁴⁴ *Ibid.*, 12.

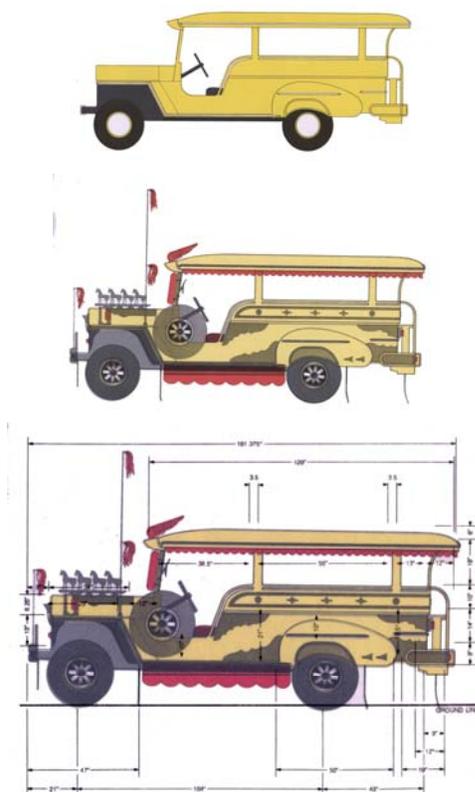


Figure 4.10. Transformation of the Jeepney.

Source: Emmanuel Torres, Jeepney (Quezon City, Philippines: GCF Books, 1979), 42.

By 1951, Francisco began to expand his painting business, branching out into body building and repair. The popularity of the jeepney accelerated in the 1960s and 1970s. Francisco by this time began manufacturing chassis frames and other metal components.⁴⁵ By 1983, there were 427,925 jeepneys, compared with only 16,714 buses⁴⁶ and a practically nonexistent train system.⁴⁷ Francisco’s painting business helped transform a mass-produced vehicle into something unique and extravagant in the eyes of the masses.

⁴⁵ Ibid., 12.

⁴⁶ “The Prime Movers,” Ibon Facts and Figures (Manila), March 15, 1985, 2.

⁴⁷ Construction was underway at this time to build a Light Railway Transit (LRT) though its route was very limited and was not widely used. See Jose M. Lansang, Jr., “LRT is a Misnomer,” Mr. & Ms. (Manila), April 12–18, 1985, 21.

Sarao, on the other hand, specialized in the technical and manufacturing aspects of the jeepney business. Sarao's business also began in 1947 when he opened his own assembly shop, the same year that Francisco opened his paint shop. Sarao's background revolved around the horse-drawn carriage. Following in his father's footsteps, Sarao began work as a rig driver before becoming a lathe operator.⁴⁸ Similar to Francisco, Sarao did not obtain a formal education beyond grade school.⁴⁹ By 1958, he was mass-producing jeepneys,⁵⁰ having built his own assembly plant by that time.⁵¹ In the 1960s, jeepneys carrying the Sarao logo outnumbered all others seven to one.⁵²

Francisco and Sarao dominated the jeepney business throughout the next several decades. Their commercialization efforts represented a fusion of the machinelike wartime jeep and the festive image of the horse-drawn carriage. A writer summarized Sarao's and Francisco's styles and backgrounds:

Sarao's *conchero* [driver of horse-drawn carriage] background, like Francisco's, is readily recognizable in his jeepney designs. The horse motif is forever present. On the hood can be found three, six, even up to 14 stallion emblems, while horse tails and reins are painted on the sides.⁵³

The tradition of decoration and flair in the *calesa* made its way into jeepney designs. Thus the use of the jeepney not only parallels the use of the *calesa*; its look and style also mimicked the embellishments found in Filipino horse-drawn carriages. The Philippine Institute of Hotel Administration described the manner in which the jeepneys were adorned like “decorated horse-drawn carriages prancing in the cobbled streets of old Manila.”⁵⁴ The horse emblems found in the jeep signified not only the

⁴⁸ Torres, *Jeepney*, 48; Bigkislahi, “Jeepney: Cacophony, Color, Culture,” 12.

⁴⁹ Torres, *Jeepney*, 46.

⁵⁰ *Ibid.*, 48.

⁵¹ Uurlanda, “Jeep-Making: Imus’ Sunshine Industry,” 12.

⁵² Bondoc, “The Jeepney Kings,” 12. Also in Torres, *Jeepney*, 48.

⁵³ Bondoc, “The Jeepney Kings,” 12.

⁵⁴ “The Jeepney—A Remarkable Vehicle of Philippine Folk Art,” 1971, 19.

conchero background of the two pioneers but also, arguably, the pervasive role of the *calesa* itself in Philippine culture.

Jeepney: The New King of the Road

The horse emblem had become as indispensable an element of the jeepney as its mechanical parts. The iron sculpture of a standing horse on top of the hood, right above the grill guard, was the most popular chrome emblem after 1955.⁵⁵

The hood, which is about a meter square, is the special repository of all the creativity of the jeepney decorator. Almost mandatory here is the chrome horse standing upright on the hood, which may perhaps signify an awareness of the vehicle's "root," the horsedrawn *calesa*.⁵⁶

It is interesting that the local writer describing the "mandatory" horse emblem of the jeepneys attributes its origin not to the US military jeep but rather to the local horse transport it sought to replace. What he observed was the family resemblance between the current jeepney and the *calesa*, particularly in the way its technological form mimicked that of the horse.

In the early days, the horses that pulled the *calesa* were embellished like kings, with little crowns on their heads.⁵⁷ Similarly, the hood of the jeep was embellished with chrome and décor that resembled the head of a *calesa* horse. This skeuomorphic practice, which George Basalla described as old elements persisting in new artifacts despite having no practical application, played a critical role in transforming the foreign artifact into a familiar object. Indeed, these horse emblems and embellishments were so important that an entire industry emerged devoted solely to the jeepney's decorative regalia, paintings, upholstery, and all the additional elements that transformed a mass-produced frame into customized folk art on wheels.⁵⁸

⁵⁵ Torres, *Jeepney*, 58.

⁵⁶ Nofuente, "The Jeepney Vehicle As Art," 42.

⁵⁷ *Ibid.*, 40.

⁵⁸ Urlanda, "Jeep-Making: Imus' Sunshine Industry," 12.

These embellishments made each jeepney one of a kind: no two jeepneys were ever identical—a far cry from their stringently standardized jeep predecessors. However, the horse emblem consistently appeared in each of these variations. The design and structure of the jeepney could even be modified according to the buyer's specifications.⁵⁹ Thus passenger capacity in jeeps ranged from 16 or 18 passengers⁶⁰ to as many as 22 to 30,⁶¹ although this upper limit was more the exception than the rule. The horse emblem persists, however, throughout these customizations.

The singularity of each embellished jeepney provided the means to distinguish it from the ordinary and common vehicles of the day. While the decorations and embellishments supposedly attracted more passengers, they had more to do with the driver's desire for personal expression than with marketing or branding, given the lack of consistency across various vehicles. Dario Vega, a jeepney driver for nine years, spoke of the horse chrome decoration of his jeep as his way of having “porma,” or a sporty, dashing image.⁶² Rupino Prestosa, a jeepney driver for fifteen years, likewise spoke of the horse chrome as “pang-arte,” or artistic flair, artistic expression.⁶³ The majority of the jeepney drivers interviewed, about ten out of fifteen, mentioned one or both of these factors in describing the purpose of the horse chrome.

This need for personal expression also simultaneously corresponded to a shared universal value when the drivers spoke of seeing the horse chrome as an icon of the Philippines. Dario Vega described it as “simbolo ng Pilipinas,” a “symbol of the Philippines.” Still others described the horse as part of shared folk beliefs like the *tikbalang*, although in this case it is a good omen. Jojo Quines, who has been driving a

⁵⁹ Ureta, “The Jeepney is Still ‘King of the Road,’” 30.

⁶⁰ Lamberto E. Antonio, “Pambihirang Sasakyan, May Lulang Kasaysayan,” 13.

⁶¹ Francoise Joaquin, “Facelift for the Faithful Jeepney,” *Asia Magazine* (Manila), October 10–12, 1997, 6.

⁶² Interview with Dario Vega, October 29, 2005.

⁶³ Interview with Rupino Prestosa, November 5, 2005.

jeepney for twenty years, described the horse chrome as “swerte,” or a “good luck charm,” as well as “pamahiin,” or an “auspicious symbol, superstitious belief.”⁶⁴

This paradoxical meaning of the particular and the universal is also expressed in the jeepney itself. No two jeepneys are alike, but commuters recognize jeepneys in general rather than a particular jeepney manned by a particular driver. Sarao and Francisco, however, branded many of the vehicles they produced, although one rarely sees their names these days because they have gone out of business. They are nevertheless still known as the “Jeepney Kings,” whose brand remains immediately recognized by present-day jeepney drivers. Each of the jeepney drivers interviewed knew the brand names Sarao and Francisco.

Still, many refer to the jeepney as the new “King of the Road,” a title previously reserved for its predecessor, the *calesa*, which often displayed a big sign right above its roof proclaiming it “Hari sa Kalsada,” or “King of the Road.”⁶⁵ The jeepney drivers themselves came to embody this role when they spoke of their work as sovereign or self-governing. For instance, Alfredo Bodayong, 51 years old, has driven a nine-seater jeepney for twelve years and plans to continue driving jeepneys despite the low pay, because, he reasoned in the Ilocano dialect,⁶⁶ “Awan gamin iti agbabaon,” which translates as “because no one orders you around.”⁶⁷

The sense of independence jeepney drivers relish has been further reinforced by the imagination. Abetted by various decorative representations that helped create a fantasy world, the jeepney driver added props to his vehicle that reminded him⁶⁸ of home and, at the same time, a place somewhere very much unlike his home. The horse

⁶⁴ Interview with Jojo Quines, October 29, 2005.

⁶⁵ Bigkislahi, “Jeepney: Cacophony, Color, Culture,” 12; Also in Uurlanda, “Jeep and Jeepney Assemblers Cooperative,” 10.

⁶⁶ It is the same Ilocos region mentioned in the Lopez testimony in 1899.

⁶⁷ Interview with Alfredo Bodayong, October 29, 2005.

⁶⁸ Almost all jeepney drivers are male. I have ridden in jeepneys extensively for more than twenty years, and all the drivers I have encountered have been male.

embellishment itself became the necessary prop for an imagined reality, a gateway from the grueling realities of long hours of work, the smog, dirt and heat of city life. A Filipino art critic and poet described the driver's sentiment:

With saddle and stirrups (both simulating tooled leather), the gleaming “silver” or “white” horse standing in readiness makes a splendid symbol. It stands for what every driver wants his runabout to be, fleet and rugged. This is no puny Batangas [name of a local province in the northern part of the Philippines] horse but the heroic, muscular, tall variety seen in John Wayne movies, or better yet, the Lone Ranger's Silver. This symbol makes it so much easier for the aficionado of Western movies to indulge in a favorite fantasy where the reality of traffic outside his windshield is the Wild, Wild West, the machine he drives a white steed, and he—Jun Aristorenas or Fernando Poe, Jr. [local action heroes], in a local version of a cowboy movie, or a *pancit palabok* [local noodle dish which connotes a mixture of things] Western.⁶⁹

Indeed, Rupino Prestosa described the horse chrome, propped up typically with a spring, as a galloping horse, particularly evident when the jeepney starts moving. “Kasla agtartaray kin aglagtologto nga kabalyo,” or “It's like a running and jumping horse.”⁷⁰

If the jeep jamborees in the US were a means of escape from urban anxiety in the 1970s, the jeepney in the Philippines provided the same method of retreat for its driver, but to a different destination. Rather than having his jeepney take him somewhere far away, a jeepney driver had to rely upon an imagined escape fueled by his vehicle's various embellishments. In many ways, the jeepney drives like its military jeep predecessor, but the experience is similar to riding a horse. Jojo Quines, who had driven a *calesa* as a young lad and jeepneys for twenty years, observed that both the *calesa* and the jeepney lack shock absorption and ride roughly but that driving a *calesa* is easier because the horse has intelligence (“mautak,” or literally, “smarts”). “You pull the reins and it runs! But one cannot do that with a jeepney.”⁷¹

⁶⁹ Torres, *Jeepney*, 58.

⁷⁰ Interview with Rupino Prestosa, November 5, 2005.

⁷¹ Interview with Jojo Quines, October 29, 2005.

Many of the jeepney drivers who had driven cars, trucks, and even *calesas* generally agreed that driving a jeepney was the hardest.

“Trucks are easier,” mentioned Manny Manalastas, “because they have power-steering.”⁷² Roland Hernando, who has been driving a jeepney for ten years, mentioned the tight-shifting gears of the jeep, and how the car was far easier to drive.⁷³ Rolando Caoagas found the heat and exposure to the elements, such as the wind, particularly tiring and difficult.⁷⁴ Nevertheless, they continue to drive the jeepney because it provides them the freedom to work for themselves. One writer noted that the evolution of the jeepney was similar to that of comic strips in the Philippines; both started after WWII, and both provided some form of escape:⁷⁵ in this case, *escape from* an oppressive economic structure as well as *escape toward* an imagined reality. The driver was the king of a moving domain in a country marked by poverty.

Indeed, the jeepney driver works for no one; he either owns his own jeepney or pays what in jeepney culture is called a “boundary,” the daily minimum amount the driver needs to make to break even, the same concept as a rental fee. Once the driver “crosses” this boundary, the general allocation of earnings tends to follow a 40–60% rule; the driver keeps 40% of the total earnings while 60% goes to the owner of the jeepney. Apart from this informal financial arrangement, there has never been an overall governance structure that regulates jeepneys, just as the *calesas* were unregulated. Each driver was basically a free agent and hence king of his own jeepney domain.

⁷² Interview with Manny Manalastas, November 6, 2005.

⁷³ Interview with Rodel Hernando, November 14, 2005.

⁷⁴ Interview with Rolando Caoagas, November 5, 2005.

⁷⁵ Torres, *Jeepney*, 42. Also in Lamberto E. Antonio, “Pambihirang Sasakyan, May Lulang Kasaysayan,” 13.

The self-determination of jeepney drivers allowed them to conduct business as if, some would say, they owned the streets. Similar to the *calesas*, jeepneys would stop anywhere to pick up or drop off passengers. A prospective passenger would simply stand by the side of the road and flag down a jeepney. Getting off the jeepney would simply require one to say “Para,” meaning “stop,” a word used only in the context of a moving vehicle.

While some areas in Manila began to prohibit the frequent stopping and starting of vehicles along their roads, the majority of jeepneys still follow this *calesa* style of doing business. A Filipino writer stated, “Jeepney drivers stop every few meters, even in the middle of the road, or in corners, with no warning to, or consideration for, others.”⁷⁶ Jeepney drivers do not like following rules, and many even stopped driving their vehicles in areas where traffic rules were starting to be enforced. Rolando Caoagas, for instance, drove jeepneys for twenty-six years in the busy profitable areas of Manila, but moved to an upcountry province in the last six years because in the rural areas, he said, “Awan agtiltiliw,” or nobody catches you [literally, no enforcers].⁷⁷

However, this aggressive driving contrasts with the religious elements found inside the jeep. Many observers have noted the “homey” look of the jeepney’s interior, which often includes an altar propped up on the dashboard.⁷⁸ Michael Manalastas described having curtains, buying fresh flowers, and polishing the “God Bless Our Street” sign in his jeepney.⁷⁹ Thus, while the exterior was a manifestation of the festive flair of the *calesa*, the interior of the jeepney provided the passengers a feeling of being a guest in the driver’s home.

⁷⁶ Rene Saguisag, “There’s a Jeepney in the Filipino Soul,” *Mr. & Ms.* (Manila), October 30, 1984, 10.

⁷⁷ Interview with Rolando Caoagas, November 5, 2005.

⁷⁸ Nofuente, “The Jeepney Vehicle as Art,” 44–45. Also in de Souza, “View from a Manila Jeepney,” 3; Ureta, “The Jeepney is Still ‘King of the Road,’” 39.

⁷⁹ Interview with Michael Manalastas, November 6, 2005.

Conversion of Institutions: From Machinelike to Homelike Effect, Filipino Style

The jeepney represents various aspects of Filipino life.⁸⁰ One aspect often noted by many tourists is Filipino hospitality.⁸¹ When someone visits a home, family members always provide some type of refreshment, even if it means sending someone off to the store through the back door. If someone arrives while the family is eating at the table, an extra place is immediately laid, and everyone adjusts their rice and fish intake to provide for the guest. This habit of accommodating guests in one's home extends to the habit of jeepney drivers accommodating anyone who flags them down, even if their vehicle is full. For instance, a six-passenger vehicle would be stretched to fit seven or eight, just as a Filipino family would accommodate guests regardless of its limitations.

While one could argue that the driver is economically motivated to pack in as many passengers as possible, what is interesting in this phenomenon is the tolerance of passengers for such practices. Having ridden jeepneys for almost twenty years, I have never heard anyone complain about being packed in like sardines. It seems to be an accepted and understood practice to accommodate anyone out in the street trying to reach a destination, particularly at night. Many writers characterize this practice of trying to fit everyone into a vehicle as consistent with Filipino family values.⁸²

Indeed, home and church are the two institutions that dominate a Filipino's life, and both are clearly evident in the embellishments to the jeepney. These are highly personalized. "The driver thinks of his jeepney, not as a simple vehicle with which he makes a living, but as an extension of his home, his church, his pride, his fears, his very self."⁸³ The names of his individual family members and relatives—and

⁸⁰ Torres, *Jeepney*, 58. Antonio, "Pambihirang Sasakyan, May Lulang Kasaysayan," 13.

⁸¹ Nofuente, "The Jeepney Vehicle as Art," 46.

⁸² *Ibid.*

⁸³ Torre, "Jeepney Soul," 49.

sometimes the driver's entire genealogy—are often painted all over the jeepney.⁸⁴ Every effort is made to provide the vehicle with as homelike an atmosphere as possible, particularly since the driver spends most of his day driving his vehicle along various routes for as many as ten to fifteen hours per day.

The addition of homelike touches, such as curtains along the windows of the jeepney and various knickknacks along the dashboard, gives the effect of being in someone's living room. Various Christian religious icons and images occupy the dashboard alongside the curios. It is common to find altars in many Filipino homes. Just as at home, many jeepney drivers dutifully buy fresh garlands of flowers to adorn the altar they have propped by their dashboard.⁸⁵ The religious icons were believed to provide protection from traffic and in this sense, Christian figures became intermingled with animistic practices and beliefs. Filipino syncretic religiosity has been described by many observers as one of the dominant themes in many jeepney decorations.⁸⁶

Thus, unlike in the United States where the shift from machinelike to coachlike effect involved passenger comfort, luxury, and convenience, the shift in the Philippine case was more a matter of incorporating into the jeepney the various institutions that comprise Filipino life. Riding in the jeepney was akin to being inside a home—albeit a modest home. Jeepney displays were often criticized by the middle-class as gaudy and vulgar, in other words, *bakya*, which literally means “wooden clogs,” the type of shoes associated with the lower class.⁸⁷

While the garishness of the heyday of the decorated jeeps has recently been tempered with more subdued decorations, the horse emblem persists, despite the

⁸⁴ Ureta, “The Jeepney is Still ‘King of the Road,’” 39.

⁸⁵ “The Jeepney—A Remarkable Vehicle of Philippine Folk Art,” 19.

⁸⁶ de Souza, “View from a Manila Jeepney,” 3.

⁸⁷ Rolando S. Tinio, “Romancing the Jeepney,” *Man Magazine* (Manila), January 1993, 4. Also, Antonio, “Pambihirang Sasakyan, May Lulang Kasaysayan,” 13.

demise of other decorations. A famous art critic, in a conversation with a well-known Filipino painter, observed the decline of the festive air of the jeepney:

In conversation Legaspi [a famous Filipino painter] agrees with the growing perception that, despite its exotic appeal to foreign tourists and local connoisseurs of nostalgia, this “motorized version of the *calesa*” is a sad reminder of our country’s economic plight, which continues to get worse.⁸⁸

Jeepneys appear to have been decreasing in significant numbers over the past several years. Sarao and Francisco went out of business many years ago and were not replaced by any new entrants. The names Sarao and Francisco, once prominently displayed on many jeepney creations, are now rarely seen. Nevertheless, one continues to see garishly decorated jeepneys, although they are a dying breed. While Sarao and Francisco manufactured locally made jeeps with engines imported from Japan, jeepneys began to be replaced by surplus air-conditioned vans from Korea and Japan.

Thus, while the initial push for the use of wartime jeeps was largely dominated by various foreign and local economic forces, the eventual commercialization of what would become known as the jeepney began at the grassroots level. The auto calesa that led to the jeepney became embodied in the chrome horse, which continues to take center stage on the hood of the jeepney, even after other decorations have waned in popularity.

However, when the last horse chrome falls, there is less motivation to replace it. Roger Abalos, a jeepney driver for fifteen years, did not bother to maintain the upkeep of his decorations when the last horse chrome fell off.⁸⁹ Similarly, when the horse chrome on John Corpuz’s jeepney came off, he did not bother replacing it.⁹⁰

⁸⁸ Emmanuel Torres, “Numero Uno’s Pamana: Legaspi Reinvents the Jeepney,” Sunday Globe Magazine (Manila), September 27, 1988, 11.

⁸⁹ Interview with Roger Abalos, November 14, 2005.

⁹⁰ Interview with John Corpuz, November 6, 2005.

Diosdado Manalastas, who has driven a jeepney for eight years, scoffs at the entire idea of horse chrome and other jeep decorations.⁹¹

Although Diosdado Manalastas is the exception among the fifteen drivers interviewed, his view nonetheless represents the weakened influence of horse-drawn carriages in modern transport. *Calesas* still meander along some street areas in Manila as well as in a few rural areas, but like the jeepney, they are a dying breed. The jeepney, a mass-produced yet customized public vehicle which came to represent the fusion of the machinelike wartime jeep with the force of local *calesa* tradition, also appears to be facing its twilight years.

Conclusion

This chapter has shown the significant role the horse tradition played in ushering the use of jeeps into Philippine society. When the jeep arrived, the Philippines was a country desolate and devastated by war. Yet the discarded surplus army vehicle rose to become a custom-built, elaborately ornamented passenger vehicle called the jeepney. The jeepney represented the effort of the Filipino people not only to localize but to practically “ingest” a technology whose resemblance to its origins became just a remote suggestion. The jeep became the mechanical equivalent of the ubiquitous *calesa* in spirit, look, and feel. Pre-existing practices of communal riding, method of payment, and extravagant regal decorations of the *calesa* days transformed the military artifact into a popular mainstream transport of everyday life.

The legacy of the *calesa* practices persists in the form of a horse emblem situated on top of the hood. The horse emblem embodied the many threads that connected the past horse culture with its present symbolic mechanized form. The strength of the horse tradition permeated the jeep in many respects. From the driver’s standpoint, the jeepney replicated the socioeconomic structure of the *calesa* and

⁹¹ Interview with Diosdado Manalastas, October 29, 2005.

allowed freedom of self-expression through an automotive medium. At the same time, the *calesa* brought a sense of belonging to the driver, whose movable dominion represented many of the symbols associated with local traditions.

From the passenger's standpoint, the same sardine-packed communal riding and payment system from the *calesa* days persisted. The honor system of payment and the practice of passing fares from one passenger to the next until they reach the driver continue today. The same hospitality practiced in Filipino homes came to be expected in the riding experience. The driver finds a way to accommodate everyone. The homelike interior décor of the jeep turned the passenger into a guest rather than a customer.

In the case of the Philippines, the notion of comfort in automotive design did not originate with women, as some gender analysts have argued to be the case in the US setting. Historically, virtually all jeepney drivers have been men; they conceived the idea of transforming the jeepney into an extension of their homes. Automotive comfort, as Scharff argues, is a universally appreciated value, although in the case of the Philippines, it does not seem to have been motivated specifically by gender factors.

From an artifactual perspective, the regal décor of the *calesa* was simply transferred to the jeepney. The *calesa* background of the jeepney pioneers came into play in the transformation of the jeep's technological form and spirit. The jeepney thus was purposely designed to exhibit a forced likeness with the *calesa*, just as early US automotive pioneers tried to do with horseless carriages. However, there was a more seamless transfer of user practices from the *calesa* to the jeepney, perhaps because the concept of a self-propelled vehicle was not as controversial by that time, although it was nevertheless a novel phenomenon for a horse-driven society. What seemed to remain unchanged, however, was the machinelike driving experience associated with the old military jeep, which only the driver directly experienced.

The complexity of the jeepney represented the convergence of Filipino institutions that transformed a foreign artifact into a usable representation of the *calesa*. This convergence, partly motivated by manufacturers and drivers, facilitated the acceptance of a foreign device into the everyday life of the Philippines. The case of the jeepney shows that persistence in practices permeated the form and functionality of the jeep, allowing a peripheral military object to be transformed into a mainstream yet sublime device of everyday life.

Chapter Five

Conclusion

In each of the three cases in this study, pre-existing equine culture provided conceptual and material resources for those who sought to transform the motorcar into a mainstream means of transport. The motorcar began as an unknown and, in two cases, a threatening new device. The first case study shows that when the motorcar began to appear in US public streets at the turn of the twentieth century, its most noticeable feature—its lack of a horse—collided with the prevailing concept of motion as a product of muscle power. The newfangled machinery's most conspicuous feature—the fact that it *went* without a horse—was also its chief liability.

In the second case study, the motorcar was an unknown as a result of its unproven capabilities on the battlefield. The civilian origins of the motorcar prior to WWII stood at odds with the military's requirements for speed, light weight, and cross-country mobility. Mounted attacks were central to the US cavalry's concept of military combat. Forced motorization demanded by high-ranking military officers during the interwar years meant the obsolescence of the horse, and ultimately, the cavalry way of life, prompting fierce objections to its adoption.

In the third case study, the motorcar was not as threatening as in the first two cases. The military jeep was, after all, associated with the liberation of the Philippines from Japanese control. Nevertheless, having arrived from a different land, the jeep was exotic, and similar to the American motorcar in the first decade of the twentieth century, it was a novelty. It went without a horse in a land largely dependent upon animal power.

The features that distinguish the motorcar in each case—the horselessness of carriages in the first decade of the twentieth century, the unsuitability of commercial cars for military purposes during the interwar years, and the vehicle’s association with foreign military arms in the Philippines—had to be subdued in order for the motorcar to gain entry into mainstream society. In the first case study, automobile manufacturers *effectively leveraged* the concepts, practices, and even the horse’s reputation in order to facilitate the diffusion of the motorcar.

Asserting a likeness with the horse allowed manufacturers to speak to a skeptical public about the motorcar’s practical uses (although this likeness was sometimes forced, as in the case of the steering wheel touted to work like a pair of reins)¹ by simply pointing to the vehicle’s “horselike” qualities. Early manufacturers of the automobile, despite users’ resistance to its novelty, transformed the newfangled machinery into a familiar sight. Despite their significantly different operational controls and their lack of equine power and “intelligence,” motorcars came to pose as horse carriages through the public articulations of magazines and advertisements.

In the second case study, it was the *purposeful effort* of the United States Cavalry to preserve equine practices that led to resistance and, ultimately, to the materialization of a new technological form, the jeep. While the first case study addresses the successful transfer of equine practices as a means to the financial ends of early automobile manufacturers, the second case study shows how the efforts to protect the horse and the practices associated with it motivated technological change. Deeply hostile to the motorcar, the cavalry saw the passing of the horse as a threat to its cohesion as a combat arm. Diffusion occurred after the animal horse was resurrected in an iron form.

¹ Life, September 7, 1905, 266 (inside front cover).

As the wartime jeep successfully assumed horse-related functions, such as supporting raids and other combat maneuvers, a transfer to the vehicle of the physical and social infrastructure built around the horse occurred more smoothly—a transition that had not been achieved through direct mandates from high-level military commanders. Because its technical specifications were user-driven, the jeep carried out tasks usually performed by the animal horse; its versatility won the loyalty of the US soldier, whose close bond with his jeep came to resemble the cavalryman’s bond with “flesh and blood.”

After WWII, the jeep as an army surplus vehicle was domesticated and restored to civilian use. Its adaptability in the Philippines was facilitated, as in the first two cases, by its role as a mechanical surrogate for the horse. In the third case study, pre-existing equine practices *spontaneously effected* a new automotive hybrid, the jeepney. Elements from the *calesa* legacy transferred even more seamlessly to a new automotive medium. Although the lack of alternative transport may have motivated the adoption of the jeep, its local transformation came about as a result of the personal and institutional expressions of Philippine manufacturers and users.

In all three cases, because it was positioned to work and, to some extent, look like a horse-drawn carriage, the automobile did not need to directly challenge entrenched work and socio-cultural structures in order to find its way into people’s lives; it merely had to supplant the horse. In each case, the compulsion to negate the motorcar’s novelty—to make a new thing “old”—promoted technological change. In the case of the cavalry, the motorcar eventually diffused throughout the military when the conceptualization of an ideal iron horse materialized in the form of the jeep. The jeep provided the military with the means to replicate the horse’s capabilities.

In the Philippine case, parallelism with the horse came in the form of a localized jeep, the jeepney; its appearance and use mimicked that of the local horse-

drawn carriage, the *calesa*. The transfer of decorative motifs, symbolic icons, and user practices provided longevity to abandoned military jeeps in the post-war Philippines. In all three cases, it was the attempt to make the motorcar “common” like the horse that made it “invisible,” and eventually, ubiquitous.

Significance of the Study

This study found that the transition from muscle to motor power in all three cases required the transfer of elements from the old to the new. Elements from the existing horse culture were incorporated to aid the diffusion of the new motorcar: terminologies, nomenclature, material designs, functionality, and infrastructure associated with the horse in each case were employed to legitimize the emerging motor-powered vehicle. While historical and sociological studies of technological innovation tend to place a new technology at center stage, this study shows that the *new* depended upon the *old* in order to become widely accepted.

Historians such as Berger and Flink have emphasized in particular the automobile’s technical and economic advantages over the horse as motivations for adoption. Berger argues for the motorcar’s greater power, performance, and efficiency,² while Flink points to its superior qualities of cleanliness, safety, and reliability.³ Kline and Pinch state that “the advantages of the car became all too clear-cut.”⁴

However, what technology studies have not addressed is the use of horse culture to create readily understandable concepts for the newly emerging and thus unfamiliar motorcar. Not only did its innovative features—its ability to haul far

² Michael L. Berger, *The Devil Wagon in God’s Country* (Hamden, CT: Archon Books, 1979), 34.

³ James J. Flink, *The Car Culture* (Cambridge: MIT, 1975), 35. Also in Flink, *The Automobile Age* (Cambridge: MIT, 1988), 138.

⁴ Ronald R. Kline and Trevor Pinch, “Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States,” *Technology and Culture* 37 (1996), 773.

heavier loads and run for longer periods of time—facilitate the motorcar’s adoption; so did its association with the conventional horse. Established interpretations of an old artifact in this case facilitated the comprehension and eventual diffusion of a new device.

The skeuomorphic elements that Basalla considers irrelevant in new artifacts may, in fact, serve a crucial purpose—to ensure their use by defusing the threatening effects of their novelty. The jeepney’s horse chromes, in this sense, were as intrinsic to its functionality as its mechanical parts. Their presence helped evoke a certain sentiment that facilitated use.

Indeed, Schivelbush admitted that, to his knowledge, in Europe “there were no attempts to create a passenger car that would be compatible in its form with the modern technology of the railroad—i.e., one that would no longer have anything to do with the coach-driven compartment.”⁵ The legacy of the horse-drawn carriage persisted despite the change in locomotion. Why, then, did designs from the horse-drawn carriage continue to be used, if such designs were an anachronism in the modern technology of the railroad? Schivelbush did not address this issue.

This study also found evidence that gasoline car advertisements directed at women began to appear as early as 1902, contrary to Scharff’s claim that early automobile manufacturers initially marketed gasoline cars largely to men.⁶ In fact, from the automobile industry’s earliest stages, manufacturers sold cars to anyone who could afford them. Reminiscences of early manufacturers evidence a determined effort to market to all potential *mainstream* users, including women.

⁵ Wolfgang Schivelbusch, *The Railway Journey: The Industrialization of Time and Space in the 19th Century* (Berkeley: The University of California Press, 1986), 784.

⁶ Virginia Scharff, *Taking the Wheel: Women and the Coming of the Motor Age* (New York; Toronto: Collier Macmillan Canada: Free Press; Maxwell Macmillan International, 1991), 37.

Scharff's assumption that manufacturers were influential enough to delay the diffusion of the gasoline car as a result of their mistaken, gendered worldview accords them too much control over the consumer market. After all, a rising but still uncertain automotive industry made manufacturers vulnerable to and dependent upon their customers. As part of a gendered worldview argument, Scharff also posits that comfort in terms of ease of use was a universally appreciated value but was initially required by women. In the Philippines, automotive comfort was initiated by an all-male group of manufacturers and drivers. Thus what may be considered feminine in one culture may not be considered so in another culture. Associating values, devices, and things with a certain gender appears to be a function of context.

Limitations of the Study

This study was limited by the scarcity of primary sources in the Philippine case. The third case could be improved by interviews with people who lived through WWII and observed the proliferation of the jeepney. While the focus of the chapter was jeepney drivers, interviews with passengers might have provided another perspective. The absence of user perspective is a limitation that the third case shares with the first case study.

Similar to the Philippine case, the first case study focused intensively on manufacturers and their opinions regarding the consumer market as expressed through advertisements. The addition of user narratives on the transfer from muscle to motor power would have provided a check on the accuracy of manufacturers' readings and their assumptions regarding the emerging automotive market. Data regarding suppliers and distributors who sold both horse and automotive transports might have provided insights into the buying and selling practices of the transportation industry as motorcars replaced the horse.

In addition, the case study on early motorcars did not fully explore the details of US horse culture prior to the introduction of the horseless carriage. It would be interesting to see how horse-drawn carriages were advertised, what buying and selling practices were employed, and how horses were used for private and public use. The first case study is limited by the absence of these types of baseline comparison, which were available in the second and third cases.

Finally, the second case study would be enhanced by a comparative analysis of how motorization experience differed across various combat arms. A study of the motorized arm of the infantry and its experiences with the use of horses might provide a contrast to the experiences of the cavalry. In addition, the absence of primary sources that directly link the designs of the jeep with the physical attributes of the horse limited the generalizability of this case.

Suggestions for Future Research

It would be interesting to apply the thesis of this study—new technology appropriating elements from old technology for legitimation purposes—to analyze the diffusion of other ubiquitous technologies, such as computers, refrigerators, televisions, and cellular phones, to mention a few. The organizing concepts of the computer and of email software—for example, files, folders, inbox and outbox—replicate the desk of a secretary in the days of the typewriter and carbon copies. The physical office has been transferred to an electronic medium.

It would also be interesting to specifically examine why the modern computer keyboard retains the layout of the original 1870s typewriter.⁷ This keyboard layout has remained virtually unchanged for more than one hundred thirty years despite radical

⁷ For the story of QWERTY, see Paul David, “Clio and the Economics of QWERTY,” *American Economic Review* 75, no. 2 (1985): 332–337. Also, see Paul David, “Understanding the Economics of QWERTY: The Necessity of History,” in *Economic History and the Modern Economist*, ed. W. N. Parker (London: Basil Blackwell, 1986).

revolutions in office technology such as the rise of personal computing. The original keyboard layout persists despite its inefficiencies—the letter “A,” one of the most frequently used letters, is located under the relatively weak left pinky, while the rarely used letter “J” is located under the strong right index finger.

Typewriter keys were purposely positioned to slow down fast typing in order to minimize their jamming together as they hit the typewriter ribbon. While such problems do not exist in an electronic environment, typists are stuck with the same awkward keyboard layout. Why does such inefficiency persist in a system such as the personal computer, whose survival and success seem to depend largely upon a culture of speed and efficiency?

It would also be interesting to investigate how practices from other industries may be co-opted by a nascent technological device. For instance, unlike in the United States, consumers in the Philippines generally do not buy in large quantities—there one can buy a single cup of rice, a single cigarette, or even three tablespoons of oil. It is interesting to find the same incremental buying practices used in the purchase of fairly sophisticated commodities, such as cellular phone minutes.

Whereas in the United States users generally belong to some form of calling plan, with a fixed limit of calling minutes per month, consumers in the Philippines can purchase cellular phone minutes for as little as forty cents (twenty Philippine pesos)⁸ and send a text message for around two cents (one Philippine peso). The selling practices of the cell phone industry in the Philippines perpetuate the selling practices associated with cheap, perishable consumer goods.

Exploring the characteristics of practices and technological forms that are carried over to new technologies, as well as those that are not, would provide interesting insights into the tension between stasis and dynamism. Mapping the

⁸ Exchange rates for one US dollar equaled fifty-two to fifty-five pesos in early 2006.

elements of a newly emerging system to its predecessor—a one-to-one correspondence analysis on the systemic level—would complement the largely individual-level analysis found in this study.

In the first case study, for instance, it would be helpful to profile the horse culture and industry in greater detail, tracing which elements were transferred to the automobile industry, which elements were not, and which of the former persist today. Some elements may have served transitional purposes only; for example, we no longer refer to an automobile as obedient to the will of its driver, although we may refer to its “handling.” Some elements from the horse legacy remain today, such as the practice of quantifying the power performance of engines in terms of horsepower.

Finally, this study principally focused on the *process* of the transition from muscle to motor power and the critical role pre-existing practices played in inhibiting and facilitating this transition. A future area of study would be to identify and trace the origins of *preeminent practices*, namely, specific actions and movements that continue from one technological form to another, and to determine the qualities that make these practices enduring, particularly as they relate to the notion of *habitus* put forth by Pierre Bourdieu.

Bourdieu argues that people have ingrained predispositions to “cope with unforeseen and ever-changing situations.”⁹ *Habitus* represents a form of internal volition that serves as a mechanism for managing change. It also includes collective practices and pathways (infrastructure) placed in a social world. It would be interesting to examine how such elements manifest themselves during the transitional phase of large-scale technological change and how they eventually inhabit the use of new devices.

⁹ Pierre Bourdieu, *Outline of a Theory of Practice*, trans. Richard Nice (Cambridge: Cambridge University Press, 1977), 72.

Concluding Remarks

In each case study, there was a fervent disposition to maintain the horse culture. The use of pre-existing practices as an explanatory device provides a perspective that insists upon continuity as a condition for change. Examining pre-existing practices provides insights into how mass adoption for the motorcar occurred. Manufacturers of the newfangled machinery effectively appropriated the vocabulary, physical infrastructure, functionality, and work routines built around the horse. This strategy provided the newfangled machinery readily available concepts that were immediately understood in an environment entrenched in horse culture.

When early American automobile manufacturers recast the motorcar as a mechanical horse, they did so in an effort to convert a skeptical public from spectators to consumers. Through advertisements, manufacturers appropriated the goodwill earned by the popular horse to recast the notorious, hair-raising “devil wagon” as a sensible, safe form of transport.

In the case of the military, it was the physical translation of the horse into an iron form that eventually ushered in a successful motorization campaign. The jeep, also referred as the “blitz buggy,” became the military’s new warhorse in modernized warfare. Similarly, the AC or Auto Calesa of the Philippines, a localized version of the jeep, provided for the continuity of the legacy of the horse-drawn *calesa* in an “automated” mechanical form.

In a context dominated by the use of the horse, the staging of the motorcar as its operational and functional equivalent opened the doors for an alternative. Appropriating equine transport practices and capabilities provided the means for the emerging motorcar to compete with the seemingly indispensable horse. The motorcar came to dominate by virtue of its association with what it sought to replace.

Focusing on how controversial technologies present themselves as variations on the old may thus provide necessary insights into how enrollment is achieved. The strategy of appropriating the physical forms, practices, and infrastructures of the proven work horse helped to mitigate the liabilities posed by the motorcar's novelty. Such appropriations may be particularly effective for those devices for which reassurances of predictability and familiarity are critical to acceptance.

What provided admission for the motorcar in all three cases was its taming, or in Silverstone's parlance, its "invisibility."¹⁰ This "invisibility" required the motorcar to appear to be as mundane and sensible as the ubiquitous horse by making *visible* in the new artifact what was *invisible* in the old—the safety, reliability, and ease of operation of the horse-drawn carriage; the ruggedness and cross-country capability of the war horse; and the flair and flamboyance of the *calesa*—all taken-for-granted features found in the ubiquitous horse transport.

Thus this study found that the transition from muscle to motor power was a matter of connecting old ways with new things, a reversal of what most user studies tend to emphasize: the finding of new uses in old things. A successful campaign for technological change may well require presenting the new as something familiar. A 1902 illustration from The Automobile (Figure 5.1) perhaps foresaw how the motorcar would evolve during the next decade: *omnia mutantur*, "the more things change, the more they stay the same." Indeed, such was the case.

¹⁰ Roger Silverstone, Television and Everyday Life (London: Routledge, 1994), 98.



Figure 5.1. "The More Things Change, the More They Stay the Same."
Source: The Automobile, (edited by Angus Sinclair), July 1902, 587.

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