JAPAN'S MOTORCYCLE WARS

Jeffrey W. Alexander

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An Industry History

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For Carolyne

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Acknowledgments

In the summer of 2001, I came across a photographic catalogue of many of the motorcycles built in Japan since 1945, and I examined it with surprise. Some of the earliest machines looked exactly like British and American motorcycles dating to the 1930s and 1940s, but the many Japanese firms that had produced them had long since gone out of business. Further searches for any trace of these companies turned up very little, for I soon discovered that while there are many scholarly volumes on the history of Japan's automobile industry, there is next to nothing written about its motorcycle industry. I had discovered what every researcher seeks – a hole in the literature. This book, which began at the University of British Columbia, is my humble effort at filling a part of that hole.

This project was made possible through funding from the Social Sciences and Humanities Research Council of Canada. Further financial assistance was extended by the University of British Columbia and UBC's Centre for Japanese Research (CJR). I must thank my advisor, William Wray, for his support of this investigation and for providing the autonomy that enabled its progress. The director of the CJR, David Edgington, also provided terrific guidance. Thanks to Diana Lary, the former director of UBC's Centre for Chinese Research, who has been hugely supportive over the last several years. Special thanks to Michael Cusumano of MIT for his helpful comments and for his encouragement. Thanks also to the patient staff of the UBC Library. Their efforts gave me access to Japanese company histories from the excellent collections of the University of California at San Diego, Ohio State University, the University of Chicago, Duke University, and the libraries of the University of Southern California.

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also to Martin Jack Rosenblum, Chief Historian and Archivist at the Harley-Davidson Motor Company, for his courteous assistance. I am especially grateful to Yaesu Press, VelocePress, and the Japan Automobile Manufacturers Association for permission to reproduce material appearing in their publications.

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Japanese is a difficult language for Westerners to penetrate, and local or historical place names in Japan are sometimes as difficult to read as the names given to Japanese people born over a century ago. Even native Japanese speakers often cannot read such names aloud with absolute certainty, for local pronunciations vary and given names are seldom used in day-to-day communication. My sincere thanks therefore go first to Iwatate Kikuo, whose vast knowledge of Japan's early motorcycle and auto industries was crucial to this study. Iwatate introduced me to my principal documentary source and permitted me, a stranger at the time, to take that rare volume from his home in Chiba to Tokyo for duplication. I must also thank Enokido Keisuke, Yoshida Kaori, Okuma Kenji, and Seki Nobuhiro for their assistance and advice. All Japanese names appearing in the text are presented in the traditional Japanese fashion, with the family name first and the given name second. I alone remain responsible for any errors or omissions that may appear in my translations.

Finally, I must thank my wife, family, and friends, as well as my colleagues at UBC and the University of Wisconsin-Parkside, for their generous support.

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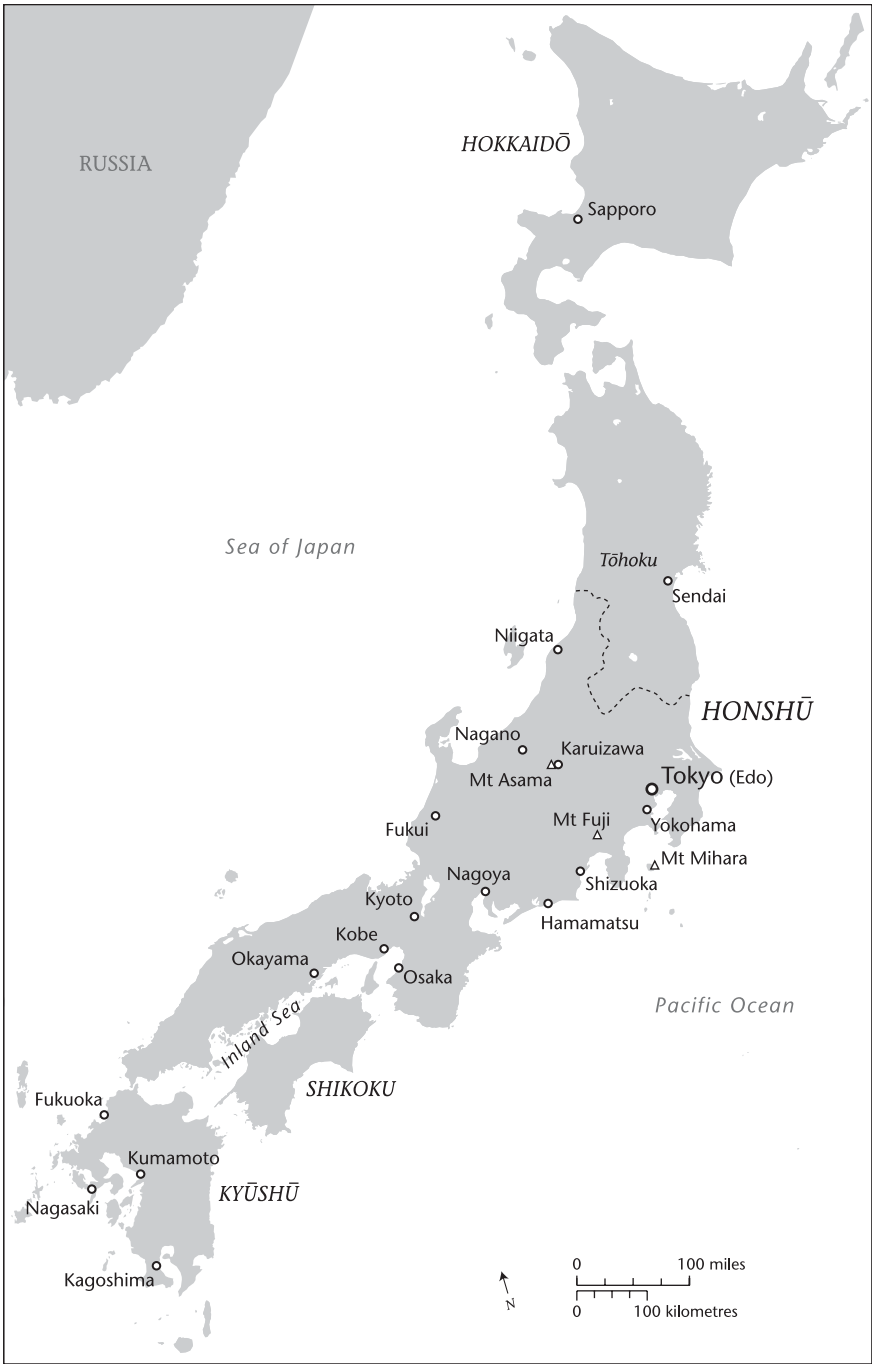

Map of Japan featuring places mentioned frequently in the text. *Cartographer: Eric Leinberger*

Introduction
Why the Motorcycle?

In China, India, and Southeast Asia today an important business war is being fought among hundreds of manufacturers of one of the world's most ubiquitous and deadly machines: the motorcycle. These firms, located principally in China, are putting millions of new motorcycles and scooters onto Asia's roadways each year, and in developing nations throughout Asia both ridership and traffic fatalities have reached record highs.[1] Though this costly pattern of development has remained unexplored until now, it has a precedent – Japan's own experience of rapid two-wheeled motorization both before and after the Second World War (1939-45). Few Western historians or industry writers are aware of the age, geographical breadth, or former scale of Japan's motorcycle industry, which in 1955 comprised over two hundred manufacturers. For decades, however, it was one of the crown jewels of the postwar manufacturing community, and it remains one of Japan's leading industries today. There have also been few studies of Japan's integrated public and private sector driver-education campaigns, which since 1970 have successfully curbed the dangers of motor vehicle use. This book, therefore, examines the historical development and impact of Japan's motorcycle industry between 1908 and 1980. It identifies the specific development strategies pursued by its surviving firms – which numbered just four by 1973 – and seeks to chart, explore, and explain the phenomenal cull of

a manufacturing sector that had become one of Japan's most profitable export industries by 1970.[2]

Because this topic may garner attention from a varied audience, I must state my intentions clearly at the outset. First of all, this book is not about motorcycles specifically; rather, it uses the motorcycle industry as a window through which to explore several important aspects of Japan's twentieth-century industrial, economic, and societal development. Second, as an historian, my approach is framed by the kinds of questions that historians ask. In contrast, when exploring Japan's motorcycle industry, a management theorist might ask, How did this industry's most successful companies manage to compete in the American marketplace? An engineer, on the other hand, might inquire, How were their assembly lines organized? or How did their products stack up technologically? A political scientist, meanwhile, might ask, How were their workers organized? and What was the role of labour union activity? Although I touch on each of these issues to some degree, I am interested principally in the challenges that faced entrepreneurs and engineers during Japan's transwar period as they struggled to stay competitive.[3] Therefore, I ask, How did this industry shrink from over two hundred postwar companies to just four? What was it like to do business in that atmosphere?

Answering these questions requires an examination of this process from a Japanese perspective using contemporary Japanese sources, many of which reflect wider patterns of postwar economic and industrial activity. Comparisons to other Japanese industries and consumer products must be drawn carefully, however, for the development of one market did not always parallel that of others. In fact, by virtue of how much remains to be discovered about this industry alone, sweeping generalizations about Japan's twentieth-century industrial development are best avoided. For Japan's small and medium-sized motorcycle manufacturing companies, doing business was a turbulent and hazardous pursuit involving all manner of lucrative opportunities and nasty surprises. Fortunes rose and fell so quickly that almost no compass bearing could be trusted, and the expectations of even the most veteran firms were often shattered between one year and the next. These competitive pressures, and the acrimonious struggle that they generated, interest me most of all.

In the prewar era I focus, therefore, upon the efforts of fledgling Japanese manufacturing companies to produce reliable working motorcycles based upon foreign designs – a tall order for engineers in the 1910s and 1920s. I then explore the role of motorcycle producers in Japan's prescribed wartime production

regime during the late 1930s and early 1940s. Most importantly, I examine how Japanese entrepreneurs picked up the pieces of their demolished factories in late 1945, cobbled together working production lines, and began or resumed producing competitive machines in an era of severe privation. Their specific product lines are not my chief concern, although as valuable indicators of Japanese efforts at product development, patent acquisition, and marketing strategies they are not merely abstract commodities. Still, my principal focus is on the experiences of individual company directors who battled first wartime production controls, then material shortages, and finally each other in their pursuit of domestic market share before 1965. The forces affecting Japan's motor vehicle industry extended far beyond the boardroom, the production line, and the showroom floor. I therefore explore this industry as a part of a proposed "transportation equation" in which marketplace competition, the economy, driver and vehicle licensing programs, and road development all worked in concert to select the most capable firms. These selective pressures, which are seldom considered in other studies of the motor vehicle industry, formed the turbulent atmosphere in which the manufacturers fought for market share. Contextualized historically, the motorcycle industry can teach us much about twentieth-century Japan.

Documenting the activities of shop-based manufacturers operating during the transwar era, however, is extremely challenging. Very few of the companies that populated Japan's motorcycle industry in the 1950s left behind much evidence of their origins or their operations, so the rapid contraction of the field during the middle of the decade is difficult to reconstruct. The paucity of English-language scholarship in this area may be blamed, at least in part, on this scarcity of records.[4] This challenge is not unique to the study of the motorcycle industry in Japan, for very few scholarly studies of motorcycle makers outside Japan exist either.[5] Furthermore, while enthusiast publications continue to have immense appeal, the authors of the thousands of websites, repair manuals, and photographic collections related to Japan's motorcycle industry generally reproduce whatever details today's firms have elected to publish in English. As the vast majority of foreign enthusiasts are unable to penetrate Japanese sources, the industry's leading firms are free to present the history of their business to Western audiences as selectively as they choose. Consequently, few outside Japan are aware of the foundations of these firms' success or the business war in which they engaged during the 1950s and 1960s.

More broadly, Western understanding of Japan's transwar industrial experience has been distorted by the preoccupation of economists and management

theorists with Japan's success in international markets after 1960. Numerous studies seeking to identify the roots of this success have focused principally on the origins of Japan's largest and best-known firms.[6] Although useful in certain cases, this approach has often neglected Japan's small-business community, especially in the 1950s and 1960s, and has also led to a series of tired conclusions about the mutually beneficial or communitarian nature of Japan's twentieth-century industrial and economic progress. When the travails of Japan's small and medium-sized manufacturers are discussed, the picture is often painted with a broad brush, and with very few strokes. This is, perhaps, not surprising, for the many firms that comprised Japan's vast postwar subcontracting networks generally laboured in obscurity, clung tenuously to narrow profit margins, and have therefore collapsed or departed from "overpopulated" manufacturing sectors almost totally unnoticed. Meanwhile, MBA students worldwide continue to study the business strategies of the largest, most successful Japanese firms – companies that, by virtue of their success in international markets, have garnered significant attention. Although the Toyotas, Hondas, and Mitsubishis of the world are indeed deserving of careful observation, few students or scholars have explored the vicious domestic business wars that put these industry leaders on top. Those authors who have paused to discuss the contraction of Japan's postwar manufacturing sectors during the 1950s and 1960s have often characterized the era as a mere "shakeout period" in which overpopulated sectors were culled through the elimination of redundant firms. The surviving firms' many former competitors, who in some cases totalled 95 percent of their respective manufacturing fields, are virtually unknown to us. Consequently, Western understanding of small business in postwar Japan, the experiences of its many entrepreneurs, and the intensity of postwar domestic competition remains terribly one-sided. As this book will make clear, the real challenges of doing business in postwar Japan are illuminated best by those entrepreneurs who did *not* survive. This is where the historian, unlike the economist or the management scholar, may aim to correct the imbalance found in many studies of the business world – by examining an industry's development as a whole, rather than simply through the history of its surviving firms.

The motorcycle industry provides an ideal case study for a more balanced analysis, for like much of Japan's vehicle, machine, and parts manufacturing base, its history is characterized by an unbroken continuum of development during the transwar era. No single company may be said to have founded Japan's motorcycle industry, and many important firms have enjoyed lengthy, successful,

and profitable operations in various periods since its inception. Nevertheless, by the early 1960s the "Big Four" companies – the Honda, Yamaha, Suzuki, and Kawasaki motor companies – had managed to eclipse over two hundred rivals, several of which had been in business since long before the Second World War. These defunct companies are still well known to many Japanese today, and are the equivalents of such Western motorcycle manufacturing "failures" as Norton, Indian, Triumph, and BSA – influential marques with rich, colourful histories all. Apart from a small number of books and business case studies of the Honda Motor Company, however, there is very little English-language literature on the motorcycle industry's historical development in Japan.[7] Honda's early growth has been examined in some detail by a handful of Japanese scholars, but not all of their work has been published in English.[8] Western scholarship, meanwhile, scarcely mentions the remaining Big Four firms. When they are noted, it is typically as part of a brief survey of the manufacturing base in the Hamamatsu district of Shizuoka prefecture, where all of today's firms but Kawasaki Motors still maintain at least part of their operations.[9] For all of these reasons, the geography of the industry, the experiences of its principal entrepreneurs, and its sources of corporate and institutional support have gone unexplored.

SUMMARY OF THEMES

As a competitive process leading to the selection of the firms with the right development strategies, the growth of Japan's motorcycle industry reflects a series of themes important to Japan's broader twentieth-century industrial and technological development. The first two chapters deal with the origins of Japan's motorcycle industry in the late Meiji period (1868-1912) and its development through 1945.[10] Chapter 1 assesses the physical state of Japan's road network at the beginning of the Meiji era and examines two pioneering Japanese motorcycle firms as case studies. It also deals with the early growth of motorized transportation in Japan, exploring the interrelated roles of road development, motor sports, motorcycle dealers, road traffic, transport laws, and traffic police in the Taishō era (1912-26).[11] Chapter 2 continues this discussion through the first twenty years of the Shōwa era (1926-89) before exploring the business of motorcycle production through the end of the Second World War. It concludes with three case studies of firms that were either founded as, or became, suppliers of motorcycles to the Imperial Japanese Army.

The early phase of Japan's motorcycle industry explored in these two chapters parallels that of the automobile industry in several respects. A significant

point of comparison is the importance of foreign direct investment (FDI) to the growth of Japan's automobile industry during the 1920s. Following a failed program of subsidies for domestic military vehicle manufacturers, Japan's government permitted 100 percent FDI in the auto sector in an effort to speed the acquisition of foreign technology.[12] Rather than aiding domestic automakers, however, this policy greatly hampered innovation and merely encouraged the continued production of foreign automobiles. The government's foreign investment polices of the 1920s therefore left Japan's passenger car industry weak and underdeveloped.[13] But the government's almost total neglect of the motorcycle sector and its exclusion from the foreign investment strategy made its situation even worse. With neither subsidies nor the collateral benefits of investment from foreign firms, Japan's earliest motorcycle manufacturers were responsible for making their own investments in design and production capability – a situation that naturally encouraged further reliance upon foreign imports.

For this reason, the manner in which the military selected six motorcycle manufacturers and cultivated them as its sole suppliers during the Second World War is an ideal case study of Japan's efforts at *sangyō gōrika*, or "industrial rationalization."[14] Government and research agencies sought generally to encourage the "scientific" management of Japan's defence-related industries after 1917. In accordance with these policies, many companies that had set out during the 1920s to be makers of farm implements or office equipment found themselves by the early 1940s working as military subcontractors, filling orders for turret motors and high-angle machine guns.[15] The demands of the military for the national achievement of *jikyūjisoku*, or "self-sufficiency" in critical materials, extended naturally to the motorcycle industry, and the limitation of the field to six companies was typical of the planned economy during the war era.[16] There is evidence, however, that in spite of the rigours of the planned economy, two of the six wartime suppliers of motorcycles managed to maintain a measure of control over their business operations during the war.[17] Although by 1945 the army's demands stretched their supportive operations from Dalian, China, to Sumatra, Indonesia, these firms were still able to operate private retail sales offices in Manchuria and occupied China. The motorcycle industry therefore provides an avenue for the exploration of the business relationship among Japan's military, its wartime suppliers, and the markets that both parties sought to foster on the continent during the 1930s.

The next two chapters explore the industry's broad pattern of development between 1945 and 1975. Chapter 3 examines the sudden entry of dozens of war-

time manufacturing companies, engineers, and technicians into Japan's postwar motorcycle industry. It periodizes the industry's development and it focuses upon the many material, financial, and regulatory challenges facing startup companies during that era. Chapter 4 then explores the sharp contraction of the industry during the mid-1950s and examines the selective economic, financial, and technical pressures that triggered intense competition among manufacturers. Most of the entrepreneurs who entered the motorcycle industry in the postwar era generally managed small, shop-based enterprises, and institutions like Japan's Ministry of International Trade and Industry (MITI) often ignored them. As a result, these manufacturers worked together to encourage competition and inspire innovations in product design. Their designs and marketing strategies gave rise to a series of private endurance races of critical importance to Japan's furiously competitive manufacturing community. Both chapters include case studies illustrating the difficulties faced by former wartime makers as they sought to retool after 1945 and begin, or resume, producing motorcycles for a civilian market. These include profiles of the Fuji and Mitsubishi aircraft companies in the former case, and of Miyata Manufacturing and the Rikuo Motor Company in the latter.

Thematically, the challenges that faced many of these postwar ventures are mirrored by the current development of the motorcycle industry in China. Japan's own progress in the field during the late 1940s and 1950s was similarly characterized by unique cases of technology transfer, significant efforts to reverse-engineer foreign designs, a vastly underdeveloped roadway infrastructure, and unprecedented mobilization of the populace. Japan's one-time freedom to copy foreign motor vehicle designs during the transwar era would be impossible under current World Trade Organization rules aimed at curbing design, patent, and trademark infringements by Chinese manufacturers.[18] Motorcycle industry sources reported in 2002 that eight million of the eleven million scooters annually manufactured in China were copies of Japanese models, and it was estimated that there were 140 licensed and as many as 400 unlicensed motorcycle manufacturers in China.[19] Continuing complaints by the Beijing office of the Japan External Trade Organization (JETRO) concerning this trend have forced China to pledge to crack down on producers of counterfeit goods, but Chinese manufacturers are simply doing what Japanese firms themselves did throughout the transwar era – speeding up the product development process.

The postwar development of Japan's motorcycle industry reflects several themes that have been pursued by scholars investigating other manufacturing

sectors. In her 1990 study of the history of Japan's automobile industry and its government relationships, Phyllis Genther Yoshida identified three principal types of studies of Japan's postwar growth.[20] First among these are studies that identify historical and cultural determinants for Japan's progress, such as the government's guidance of the nation's economy or the continuous power of Japan's leading corporate families (*keiretsu*).[21] The second group of studies points to industrial policy as a primary determinant in the government-business relationship. This group of studies includes those that emphasize the influential primacy of institutional sponsorship – such as that of MITI – over market forces and competition in promoting economic development.[22] The third group of studies focuses on interactions between business and government over time and do not argue for the primacy of either the market or the state in fostering economic growth.[23] These studies tend to examine specific industries and do not point to any single factor as critical to Japan's overall postwar industrial growth. This book may be classified among this group, for it considers a range of developmental pressures affecting a single industry over time.

While there have been, throughout the motorcycle industry's history, instances of direct governmental support, narrowly beneficial industrial policies, significant market pressures, and key corporate relationships, no single factor was fundamental to its growth. The industry is rooted in a transwar continuum of material, technological, and experiential development in which a broad spectrum of entrepreneurs participated. Unlike the automobile, the motorcycle's relative simplicity permitted its postwar production to serve both as an industrial halfway-house for former wartime manufacturing firms and as a small-business opportunity for many of their former technicians. Dozens of aircraft engineers left unemployed by Japan's defeat were able to take up the business of motorcycle production right alongside the former aircraft manufacturing divisions of the Mitsubishi and Fuji companies. This shift in production was, of course, inspired largely by the decision of the Allies to forbid the production of aircraft at the beginning of their occupation of Japan's home islands.[24] The early, proscriptive industrial policies issued through late 1945 by the General Headquarters (GHQ) of the Supreme Commander of the Allied Powers, US general Douglas MacArthur, were largely punitive and aimed at destroying Japan's ability to make war.[25] GHQ's aircraft ban forced redundant technicians and their former employers to seek out new applications for their particular engineering skills. Although many moved to the production of scooters and motorcycles, not all postwar startups were created equally. The relative absence

of barriers to entry during the early 1950s led to vast disparities in the access of new firms to equipment, facilities, management experience, and development capital. The failure of the weakest firms may have been inevitable, but many established companies with lengthy histories and significant experience were likewise eliminated from the industry by 1965. For this reason, the development strategies pursued by the leading makers deserve attention. In the case of the motorcycle industry, these strategies were informed, in the first instance, by the material, technical, and experiential assets generated by fifteen years of state investment in wartime production.

Chapters 5 and 6 present a sharp contrast to one another, for while Chapter 5 features case studies of the surviving Big Four manufacturers, the Honda, Yamaha, Suzuki, and Kawasaki motor companies, Chapter 6 profiles several key firms that were driven out of the industry by the mid-1960s. The operational histories of the Big Four are preceded by an examination of their industrial origins and their roles as wartime manufacturers, for these firms, together with Fuji and Mitsubishi, had far more in common than their decision to enter the postwar motorcycle market. Before beginning to make motorcycles, each of them – including the piston ring manufacturing company established in 1937 by Honda Sōichirō – already possessed a demonstrated track record of technical achievement. More importantly, all of these companies had manufactured military aircraft, aircraft components, or motor vehicle parts during the Second World War. This aspect of their growth parallels a key dimension of Michael Cusumano's superb 1985 study of the Nissan and Toyota motor companies.[26] Cusumano often points to the wartime origins of Japan's postwar industrial infrastructure, and he underlines the importance of state investment to the foundation of Japan's postwar truck and passenger car industry. What he does not discuss in detail, however, was that firms such as Mitsubishi, Fuji, Mazda, and Daihatsu produced scooters, motorcycles, or three-wheeled utility bikes for some years before making their forays into four-wheel automobile production. In addition, the Kawanishi, Shōwa, and Kawasaki aircraft companies produced motorcycles, as did many of their parts suppliers and subcontractors. In fact, scooter and motorcycle production was the industry in which several major wartime manufacturers experimented and bided their time before moving on to become automobile or auto parts manufacturers in the 1950s and 1960s. This book aims to shed light on this history and to isolate the foundations upon which the industry's four surviving firms based their technical and managerial skill.

Studies of Japanese production systems often focus upon the interrelated subjects of labour and production efficiency, debating the strategies of Taylorism (sometimes called Fordism) and "lean production" (sometimes called Toyotism) in Japanese manufacturing.[27] My study does not engage directly in this debate, for Japan's motorcycle makers were generally much smaller and far less sophisticated than firms like Toyota and have left very few records concerning their production systems. Nevertheless, several successful firms that spanned the transwar era have left clues as to their development strategies. Each of the Big Four makers' success involved four crucial components:

- wartime precision manufacturing and management experience
- a resultant understanding of the importance of mass production and die-casting techniques
- swift development of a product technologically equivalent to European models
- a strong financial position – or capacity to secure development capital from government agencies, banks, or major firms – for rapid investment in advanced production equipment.

Through the isolation of these criteria I will demonstrate that the companies best equipped to survive in the postwar era were those that capitalized upon their wartime experience of managing unskilled, volunteer labourers tasked with the mass production of materiel for Japan's armed forces. These companies understood the importance of both setting up assembly lines and designing specialized, automated equipment to enable even unskilled workers to complete tasks that typically required the attention of master or apprentice craftsmen. The required engineering and managerial skill was rooted definitively in the experience of wartime production, but this experience alone was insufficient to enable a company to compete in the motorcycle industry of the 1950s. Only when combined with a world-class product and sufficient development capital was success in the postwar motorcycle industry possible – anything less resulted in failure.

I therefore contend that it is impossible to draw balanced conclusions about the motorcycle industry's remarkable postwar convergence merely by examining the histories of its four surviving firms. Instead, the industry's development must be approached from the perspective of its leading entrepreneurs, irrespective of their long-term business performance. Although most of Japan's motorcycle

manufacturers of the late 1940s and 1950s failed, this in no way renders the study of their often decades-long operations pointless. Their activities, products, and partnerships are the context in which today's surviving firms cut their teeth and, I argue, the context in which such corporate successes should be examined most critically. What the heads of failed companies can tell us about survival in Japan's postwar business climate is often much more insightful than what we may infer from the official published histories of surviving firms. The selective pressures that drove most manufacturers from the field were as numerous and varied as the machines that they produced, and ranged from fraud and corporate betrayal to disasters both natural and mechanical. Although the study of successful manufacturers may enable us to learn much about Japan's motorcycle industry, the study of its many failed enterprises will enable us to learn a great deal more about Japan.

The final chapter explores the industry's greatest challenge: its simultaneous encouragement of increased sales and increased rider safety. In the former case, I examine the success of the Honda Motor Company versus British and European competitors in the American marketplace during the 1960s and 1970s. The trail blazed by Honda revolutionized the motorcycle market in North America in less than ten years, and it set the stage for the acceptance of Japanese automobiles by Western consumers who were often skeptical of Japan's manufacturing capability. In the latter case, I discuss the highly co-ordinated effort to reduce the epidemic of road fatalities that gripped Japan during the late 1960s and early 1970s. The intense and continuing co-operation of government, business, and private citizens' associations to reduce driver, passenger, and pedestrian deaths paid remarkable dividends by the 1980s, and the campaigns continue today. Japan's traffic safety programs are an important model for nations throughout East Asia, where road trauma has brought dire economic consequences. Only through the adoption of driver education programs on the scale of those implemented uniformly across Japan can developing nations in East Asia ensure that the benefits of road development are not offset completely by the ruinous cost of traffic accidents and fatalities.

SOURCES

In spite of the lack of secondary literature on the subject of Japan's motorcycle industry, the histories of the principal manufacturers to survive the postwar era, along with a few that did not, have been published in Japanese by their respective firms. Company histories, or *shashi,* are issued traditionally in many of Japan's

industries. These sources often provide a detailed look at the activities of firms in operation during the 1930s and 1940s – a turbulent time that few modern corporate websites discuss in English or in Japanese. Many of Japan's most famous corporations have roots stretching back to the late nineteenth century, but their public relations departments are typically reluctant to discuss their role in the country's wartime production regime. Despite the importance of the war years to their later development, the histories that are featured on most Japanese corporate websites seldom mention the period between 1937 and 1945. The Second World War is a subject that few Japanese companies have dealt with openly, and it has received little attention in the West because of the unique postwar relationship between Japan and the United States.

After Japan's surrender in August 1945, the aim of the United States was to demilitarize Japan, democratize it, and align it squarely in the American sphere of influence. Japan's utility as an American military base, as a bulwark against Communism in East Asia, and, later, as a supplier for US forces during the Korean War (1950-53) satisfied the American agenda to project its power in East Asia. In spite of its loss of the war, Japan was permitted to keep its emperor system, rebuild its economy, avoid paying the reparations demanded initially by the Allies, and begin reforming its image on the world stage. Part of this process of reformation involved an emphatic break with the past and a focus on everything new. During the first few years of the Allied Occupation, the names of hundreds of companies, products, magazines, and organizations included the prefix *shin*, or "new."[28] Many large companies retooled in the early postwar years and began producing inexpensive peacetime articles under new names, often in the same plants and with many of the same employees and machines that they had used during the war. Their managers and directors generally kept their positions, and their engineers often found ways to mass-produce new consumer products using wartime technologies, materiel, and manufacturing processes. For example, the Nakajima Aircraft Company changed its name to New Fuji Industries as it issued one of Japan's first scooters in 1946.[29] Although Japan had lost over 20 percent of its national wealth and dozens of its largest cities had been bombed to ashes during the war, most of its successful postwar manufacturers were not newly established firms but survivors of the conflict. The success of the Big Four motorcycle producers, as in many other industries, stemmed from a continuum of technological and managerial progress that spanned the transwar era, and their histories before 1945 therefore require close examination. I emphasize, however, that the wartime activities of such

companies *need not be celebrated* in order to be studied as a source of their later technical and managerial strength.

In addition to published company histories, I have also uncovered a wealth of material concerning over a dozen firms that left the industry by the early 1960s – many of whose names are still well known in Japan today. This material includes the words of the presidents, section heads, and chief engineers who established and managed more than a dozen motorcycle manufacturing companies at different points since 1908. Their accounts, which come to us in the form of transcripts of tape-recorded interviews published in Japanese in 1972, also include the words of the postwar directors of both the Japan Automobile Manufacturers Association (JAMA) and the Hamamatsu Commerce and Industry Association. These interviews were edited by Hashimoto Shigeharu, a long-time automotive industry writer for the Yaesu Media publishing company.[30] I translated extensive passages from these interviews during 2004, and what the speakers said about doing business in the postwar era is immensely revealing. Hashimoto's interviewees give us a unique and colourful perspective on Japan's industrial growth between 1908 and 1970 and the challenges facing its numerous motorcycle manufacturers. The speakers were candid, often funny, occasionally bitter, and quick both to point fingers and to shoulder blame for their companies' collapse or departure from the industry. They discussed a wide range of subjects including money, technology, alliances, rivals, betrayals, and bankruptcy. The details that they shared about managing a small or medium-sized manufacturing company in the Meiji, Taishō, and Shōwa eras are often surprising, and they are featured in supporting case studies throughout this investigation. Chapters 3 and 6 showcase much of this testimony verbatim, for as active participants in the industry, these entrepreneurs must be permitted to describe in their own words the grave competition in Japan's domestic manufacturing sectors both before and after 1945. Their unique perspectives balance the official company histories published by the surviving firms.

One of many important themes discussed by the interviewees is the development after the war of vertically integrated subcontractor relationships. The literature concerning Japan's industrial structure and its importance to the country's postwar period of high-speed economic growth often debates the origins of *keiretsu* business groups and their organization.[31] Nevertheless, the idea that vertical hierarchies of loyal subcontractors were established early on and were vital to Japan's postwar industrial recovery and growth is often taken as read by those who research Japan's production systems.[32] The testimony of

this industry's entrepreneurs, however, reveals that the relationships between motorcycle dealers and their suppliers, or between assembly companies and their parts manufacturers, were often *far* from loyal during the 1950s and 1960s. Producers in fact switched suppliers frequently, fought bitterly over narrow sectors of the market, copied one another's designs, undercut one another's prices, broke their gentlemen's agreements, and, in at least one instance, intentionally bankrupted their own subcontractors. Motorcycle dealers, meanwhile, bounced from one supplier to the next, paid cash for whatever products they could find, ran up enormous bills and paid with phony cheques, and secretly ran other businesses on the side. Consequently, dozens of parts manufacturers and assemblers of finished motorcycles went bankrupt in the recession following the end of the Korean War in 1953 and the subsequent deflation of 1954. The economic downturn slowed sales considerably; this lull caused inventories to swell, and as products piled up in the distribution network, a fierce price war developed between the manufacturers. As the competition intensified, companies even spread rumours about the quality of one another's products and the state of their rivals' finances in order to threaten their sales. As a result, the most successful companies were not those that relied principally upon subcontractors, but those that made as many of their own parts as possible in order to limit their dependence upon outside suppliers, who fell like dominoes through the 1950s. Indeed, the motorcycle industry of the 1950s is referred to by the Japan Automobile Manufacturers Association as the *sengoku jidai*, or "the era of the warring states" – an apt appropriation of the name of a violent era in Japan's history for this period of industrial competition.[33]

Another dimension of the industry's growth that may be better explored through the words of its participants is the relative importance of geography to the success of the surviving manufacturers. For many years, a mythology has surrounded the Hamamatsu region of Shizuoka prefecture and its high concentration of industries, which has been highlighted by some as a key competitive advantage for the Big Four makers.[34] My research has proven this assumption to be false. Japan's motorcycle industry is both older and much more geographically diverse than is generally understood, and for decades its most successful companies were located in the Tokyo, Osaka, and Nagoya areas. Although three of the Big Four companies maintain at least a part of their operations in Hamamatsu today, the fact that that region was home to a concentration of other industries during the 1950s was complementary at best, and otherwise irrelevant. The circumstances that determined why a company entered the

motorcycle market, how it grew, and what enabled it to succeed are revealed by the sources to have more to do with experience, vision, and financing than with proximity to other manufacturing plants.

Further supporting this investigation are two key institutional sources of historical data on Japan's postwar auto industry. The first is the Japan Automobile Manufacturers Association, or JAMA, which was established in 1967. Its publications include substantial data on the development of Japan's twentieth-century motor vehicle industry and its evolving road traffic and driver licensing legislation.[35] The second institutional source is a predecessor of the JAMA, the Japan Automobile Industry Association (JAIA), which in late 1959 published a catalogue surveying all of Japan's motor vehicle manufacturers, parts suppliers, and their principal products. In that year, a famous American auto industry writer named Floyd Clymer visited Japan and secured the rights to publish the JAIA's catalogue in the United States.[36] When it was issued in the United States in 1961, Clymer was the world's largest publisher of automotive books, and the English translation was undertaken entirely by the JAIA. The data therein provide invaluable biographical and logistical information about many of the defunct companies examined in this study – most of which never published a company history and about which records are often extremely limited. The JAMA and JAIA sources also include statistical information from Japan's Ministry of Transport pertaining to the growth and development of Japan's automotive industry and its then rapidly motorizing populace.

Lastly, any investigation of the manufacture of motorcycles must naturally pay some attention to their use. This study therefore reflects often upon the many functional roles played by the motorcycle in Japanese society. From Meiji-era technological exhibitions sponsored by Japan's royal family, to Taishō-era motor sports events, to the continental thrust of the Imperial Japanese Army in the Shōwa age, the motorcycle featured prominently. Throughout the twentieth century the motorcycle interacted in new and unexpected ways with commercial entities, university labs, research institutions, government ministries, and members of the peerage. As a tool it expanded commercial activity, lengthened the reach of such agents as police officers and news reporters, and further integrated the nation's urban and rural areas. In the postwar era it offered mobility to the populace, a much-needed manufacturing niche to former wartime firms, and an entrepreneurial opportunity to both war veterans and veteran motorcycle racers. In this study, the motorcycle is both a literal and metaphorical vehicle, providing a unique and novel perspective on Japan's twentieth-century development.

1

Japan's Transportation Revolution
1896-1931

In the early 1900s, before Japan's motor vehicle industry began, the country's roadway infrastructure was far less developed than those in Europe or the United States. Indeed, poor urban and prefectural roads and an absence of bridges remained significant concerns for both motorists and vehicle manufacturers even during the 1920s. Despite their utility as a means of transportation, small motorcycles were often shaken to pieces by the nation's poor roads. Furthermore, as the volume of traffic on the streets of Japan's largest cities increased, Japan entered what became known as the era of the *kongō kōtsū shakai*, or the "mixed traffic society." Even urban roads teemed with cars, trucks, motorcycles, horses, ox-drawn vehicles, rickshaws, men pulling wagons, and pedestrians. Improved traffic enforcement was thus required in urban centres such as Tokyo, and the motorcycle came to play a key role. The difficulties raised by the introduction of the automobile and the motorcycle required Japan's government to make two significant efforts. First, legislation aimed at controlling access to and operation of motor vehicles was codified in 1919, after which the haphazard enforcement of traffic laws at the prefectural level was streamlined. Second, the condition of urban and prefectural roads was improved. These legislative and infrastructural efforts are integral to this study because Japan's domestic production of motor vehicles was tied closely to its capacity both to manage the quality of its drivers

and vehicles via standardized licensing requirements and to support increased traffic flow. In subsequent chapters, the ongoing development of Japan's road traffic laws and its roads will serve as useful indicators of its growing roadway infrastructure and the increasing mobility of its population. This chapter explores the historical reasons for the retarded state of Japan's road network in the early twentieth century, the efforts made to remedy that situation, and the introduction of the motorcycle to Japan.

This chapter also discusses the popularity of the motorcycle with both government agencies and the armed forces during the Taishō period (1912-26), as well as the efforts of entrepreneurs in Tokyo to sell these machines to the general public. As the condition of prefectural roads improved, recreational riding and motor sports became increasingly popular in Japan, fuelling sales for pioneering automotive dealers. For this reason, I also examine the growing relationship between motorcycle racing and sales, and the involvement of the Harley-Davidson Motor Company in what by the mid-1920s had become a nationwide commercial enterprise. Finally, within these important contexts the early development of two of Japan's principal pioneers in the field of motorcycle production will be explored: the Shimazu Motor Research Institute and the Miyata Manufacturing Company. Their histories reveal dozens of important factors that influenced the timing, the scale, and the relative measures of success enjoyed by the industry's earliest domestic entrants.

TRAFFIC CONTROL AND NATIONAL SECURITY: ROADS IN THE EDO ERA

Until the end of the Edo period (1603-1868), Japan's road network and transportation policies were a product of the nation's political structure. Under the rule of the Tokugawa *shōguns*, both land and transportation were controlled and regularized by the central government, or *bakufu*, with the principal goals of maintaining political control and improving Japan's economic integration. To this end, shortly after defeating his political rivals at the battle of Sekigahara in 1600, the first Tokugawa *shōgun*, Ieyasu, set about implementing a national road system. Two of his vassals were tasked with surveying the main coastal highway between Edo, his capital, and Kyoto, known as the Tōkaidō, or East Sea Road (Photo 1), and establishing permanent post station checkpoints, or *sekisho*.[1] This system was soon expanded into the Five National Highways, or Gokaidō, which were the Tōkaidō, Nakasendō, Kōshū Kaidō, Nikkō Kaidō, and the Ōshū Kaidō roads from Edo. These five highways, together with four older

roads, were regulated by the government through a total of 248 *sekisho* post stations, at which all travellers and cargo bearers were obliged to report to *bakufu* officials. The smooth operation of the nation's post stations was a key aspect of the *shōgun*'s continual watch over the movement of people and communications throughout the land. Until the end of the Edo period, this vigilance sought to prevent not only the illegal movement of military forces aligned against the *bakufu,* but also the possibility of treasonous political combination by the lords, or *daimyō*, of the roughly 250 autonomous provinces.

Ironically, however, by the nineteenth century the efforts of the *bakufu* to maintain its careful watch over the many autonomous provincial lords placed the nation's limited network of national highways under considerable strain. The increase in road traffic began with the formalization of the system of alternate attendance (*sankin-kōtai*) in the 1630s. This political security mechanism required the *daimyō* to spend one year of every two living in Edo, which necessitated a substantial migration of people and household effects to and from the provinces at regular seasonal intervals. The *daimyō* were also obligated to house their immediate families in the capital in order to guarantee their allegiance to the political centre. The smooth flow of elaborate *daimyō* processions, goods, and communications was so vital that in 1659 the *bakufu* established a position known as the magistrate of roads, the responsibilities and importance of which grew steadily over the Edo period.[2] Despite their national status, however, Japan's dirt roads were seldom more than three metres across and were typically travelled on foot, for in the interest of national security, commoners and even lower-ranking samurai were forbidden to ride horses.

As a result, most cargo was moved along Japan's coasts by ship, especially once the Nishimawari (Western Circuit) shipping route was fully charted in the mid-seventeenth century. This sea route from the west coast of Japan's main island, Honshū, swept down the Japan Sea coast through the Shimonoseki Straits and the Inland Sea to Osaka – a city then known together with Kyoto and Edo as one of the Three Metropolises.[3] Having reliable sea routes obviated the need for large numbers of wheeled vehicles such as carriages and carts to move along the nation's highways. Road transport for virtually all items was therefore dependent upon humans and animals, both of which carried their loads on their backs.[4] Wealthier travellers were transported by litter bearers, who shouldered their passenger between themselves in a *kago* – a sedan chair suspended by a pole – also known as a basket palanquin (Photo 2). Significantly, this scarcity of wheeled vehicles prevented the nation's major roads from being

reduced to miles of muddy ruts in the springtime, as had occurred in Europe and China for centuries.[5]

But while Japan's Edo-period roads were in better shape than those in contemporary Europe, its major rivers were not bridged, and ferryboats and rafts offered the only means of fording these numerous obstacles.[6] Japan's largest river, the Ōi River, which runs through Shizuoka prefecture along the Tōkaidō, was not bridged and ferryboats were forbidden to cross it anywhere. Travellers and cargo alike were instead carried across by gangs of bearers, who forded the river on foot and braved the river's current, which was extremely treacherous during the spring rainy season. Furthermore, many of Japan's roads flooded each year in the springtime, which necessitated additional delays and the payment of rafters and bearers. All of these obstacles were deemed necessary by the *bakufu* to prevent any *daimyō* from marching an army to the capital. Given the state of the Gokaidō during the early Edo period, the trip on foot from Edo to Kyoto took roughly twelve days at an average speed of forty kilometres (twenty-five miles) per day – and even longer during the high seasons of *daimyō* processions to and from Edo, when the nation's roads and inns were at their most congested. By the mid-seventeenth century, an express messenger system of round-the-clock runners was able to traverse this distance in just three and a half days, but the cost was an astonishing four *ryō*. This sum was a year's wage for a domestic servant, enough to feed a family of four for a year.[7] Of course, in Japan's largest cities wheeled transportation was common for both people and a variety of goods ranging from library books to baked potatoes. Nevertheless, the vast majority of Japan's urban dwellers travelled on foot, and its vast cities teemed each day with shoppers, merchants, traders, samurai, government officials, and pilgrims from afar.

REGULATING WHEELED TRANSPORT

With the end of the Tokugawa *bakufu* in 1867 and the restoration of the Meiji emperor to the position of head of state, a variety of transport-related changes were brought about in very short order. In that year, Americans and Europeans living in the foreign concession of Yokohama began operating Japan's first horse-drawn stagecoach company. Their coaches ran regularly between Yokohama and Tokyo, and in 1869 the first stagecoach line to be started up by a Japanese person also ran this route. By 1872, stagecoaches were in operation nationwide, with regular lines running between Tokyo and Saitama, Osaka and Kyoto, Hakodate and Sapporo, and elsewhere. Rickshaw enterprises too began operating in Tokyo

in 1872, and by 1879, as many as twenty-five thousand wheeled vehicles were in operation across the country.[8]

Given the growing popularity of wheeled transportation after 1868, Japan's first modern road traffic laws were issued in the 1870s, and they indicate the unique challenges that these new vehicles posed for Japanese society. For example, in 1870 it was forbidden for stagecoaches and riders to travel at night without a lamplight, and in 1871 it became illegal to travel by road when naked – however hot the summer weather became.[9] In 1872, a variety of horse-related regulations were issued for the city of Tokyo, and rickshaw workers too were made aware of new regulations governing their conduct. Of course, the increasing use of animals on city streets made the demand for improved sanitation more pressing. Therefore, in 1872, the government formally undertook street-cleaning operations. Japan's first transport licensing system was begun by cabinet order in 1873. In the following year, the Tokyo Metropolitan Police Department undertook the supervision of the transport industry and began to issue new regulations concerning the behaviour and regulation of traffic in the nation's urban centres. In 1875, it was ordered that any would-be passengers wishing to board a stagecoach must signal their desire to do so by whistling. In 1877, the police prohibited drivers from operating stagecoaches while "dead drunk," and also forbade persons to fly kites, play battledore (a game similar to badminton), or spin a top in any street where vehicles, men, and horses might be disturbed.[10] Rules such as these began to be codified in 1877, when the government enacted a series of articles, known as the Automobile Control Ordinances, to supervise the transportation industry. Such regulations grew gradually in larger urban areas but did not apply nationwide.

They expanded in number upon the introduction of the bicycle to Japan in 1888, soon after which the Ministry of Communications began collecting and delivering mail by bicycle in both Tokyo and Osaka. The bicycle's obvious utility and low cost earned it considerable attention, and bicycles were soon imported in large numbers and used throughout the country. In 1898, the Tokyo Metropolitan Police Department began to oversee their regulation in the city, but despite the bicycle's proliferation on urban and prefectural roads, no national plan for road traffic regulation was yet under consideration at the turn of the century.[11]

THE DAWN OF MOTORIZED TRANSPORT

Aside from the abolition of the *sekisho* checkpoints in 1869, the new Meiji government at first gave little thought to the improvement of Japan's road network. The

government's highest priority was the strengthening of the nation's strategic and commercial industries in an effort to realize the slogan *fukoku kyōhei*, or "rich nation, strong army."[12] But Japan's growing economy required improved road access to materials and markets as circulation of money and goods increased. The narrow dirt roads left over from the Edo period had not been designed to accommodate wheeled vehicles meeting head-on and passing one another. The sudden collapse of the soft earthen road surfaces resulted in many rollover accidents, and the continued lack of bridges over major rivers only added to the difficulty of travelling overland by stagecoach through the end of the nineteenth century. Despite these limitations, the Meiji government opted to prioritize the development not of the nation's road system, but rather its burgeoning railway infrastructure.

The steam engine had been introduced to Japan in 1854, when the *shōgun* received a quarter-scale steam locomotive as a gift from the United States, delivered by Commodore Matthew C. Perry of the US Navy. Since then, Japan's most ambitious technocrats and industrialists had dreamed of constructing a national rail network. Given the usefulness of the locomotive for the rapid movement of troops, rail links were the first major infrastructure project undertaken by the new Meiji government. The project began in 1869 with technical assistance from Great Britain, and on 14 October 1872, the emperor presided over the opening of a line between Yokohama and Shinbashi, Tokyo.[13] This railway reduced the twelve-hour walk between these two cities to only fifty minutes, making a return trip in the same day possible for the first time. In 1874, a rail line opened between Kobe and Osaka. It was further connected to Kyoto in 1877, and by 1889 the Tōkaidō rail line at last stretched all the way from Kobe to Tokyo; the trip took twenty hours and five minutes. By 1896 additional lines had connected Tokyo to the northern island of Hokkaidō.[14]

The speed and efficiency of the railroad drove out land route carriers that competed for long-distance business alongside the rail lines. An almost symbiotic system therefore emerged, in which the railway lines and shipping lanes covered the long distances between major cities, and road traffic covered the short distances to and from the stations and ports in the local areas.[15] Although urban mass transit arrived with the advent of the electric tramway in Tokyo in 1903, trams played a relatively minor role in the nation's intercity transport infrastructure in the late Meiji era; although they carried an average of 617,800 Tokyoites per day by 1912, the lines generally terminated at the city boundary.[16]

Into this busy, incoherent, and ill-planned atmosphere, motorized vehicles were introduced to Japan. The Japan Automobile Manufacturers Association records that the first motorcycle arrived in 1896, one year before the first four-wheeled automobile, or *jidōsha*, was imported. The motorcycle had been patented in Germany in 1885 by Gottlieb Daimler, the founder of today's Daimler-Benz motor company. His original design, with a 260 cc engine, had its first successful trial run in 1886, when it reached a top speed of twelve kilometres (7.5 miles) per hour. This machine was essentially a bicycle with a small motor attached, which turned the rear wheel by means of a belt. A German-made 1895 model Hildebrand and Wolfmuller made its debut in Japan at a demonstration before the Tokyo Hotel in Hibiya, Tokyo, on 19 January 1896. The strange new device was imported by Jūmonji Nobusuke, the co-owner of the Jūmonji Trading Company, which imported tractors and similar farming implements.[17] The *Asahi Shimbun* newspaper reported that the sensational new device drew a vast crowd of spectators who clamoured to see it in operation.[18] The motorcycle was first known in Japan as a *jidōjitensha* (automatic bicycle) or a *tetsuba* (iron horse), but it later came to be known simply as a *nirinsha* (two-wheeled vehicle). Within a few years this new machine was entertaining crowds at bicycle races and other such sporting events. The first motorcycle race took place on an oval track around the pond in Tokyo's Ueno Park on 3 November 1901. Three foreign competitors raced an American-made Thomas Auto-Bi, a Thomas Auto-Tri, and a French-made Gladiator quadricycle at speeds of thirty-six, twenty-five, and twenty-nine kilometres per hour, respectively. Impressed by the machine's potential, several ambitious Japanese engineers were soon inspired to attempt building motorcycles of their own. The following company case studies document the many challenges that faced these pioneers, Japan's first producers and appliers of motive power.

THE SHIMAZU MOTOR RESEARCH INSTITUTE, 1908-29

The first Japanese person to design and produce a complete working motorcycle was Shimazu Narazō, who was born in Osaka in 1888. His recollections of the challenges he faced as an automotive manufacturing pioneer offer a fascinating perspective on one of Japan's earliest experiences with Western technology. When interviewed in 1972, Shimazu recalled that when he was a boy, the rickshaw was the dominant form of wheeled transportation in Japan, and that its use was "limited to doctors and lawyers and such classes of people." In 1903, when he was fifteen years old, his father bought him a bicycle manufactured by

the Pierce Cycle Company of Buffalo, New York, for the price of ¥120. By that year, a series of bicycle races had begun at Sakurajima, Osaka, which Shimazu attended, but he also read in the newspaper about a motorcycle demonstration scheduled to take place at Shinobazu Pond in Tokyo. Fascinated by the stories he had read about the workings of motorcycles, Shimazu went to Tokyo to attend. He explained that "at the pond race, an American named Vaughn, riding an automatic bicycle with a dry-cell battery and an auto-suck carburetor, made five laps around the pond and was showered with applause."[19] From this early exposure to the new technology, Shimazu Narazō embarked upon a difficult but important career as a manufacturer of motorcycles. His early technical training and engineering experience became a surprisingly familiar model for those working in Japan's motorcycle industry in subsequent decades – especially in the postwar era.

In 1908, Shimazu graduated from the spinning and weaving division of the Nara Prefectural Engineering School, and with the recommendation of the schoolmaster, he was hired by Toyoda Loom, the forerunner of the Toyoda Automatic Loom Works, in Aichi prefecture. The chairman of the company was Taniguchi Fusazo, and the chief engineer was Toyoda Sakichi, who later invented the automatic loom.[20] Shimazu remembered that after entering the company, he "very enthusiastically spent too much money on research" and was therefore sent briefly to the United States for further training and study.[21] No details of his experience there are extant, but not long after he returned to Japan and resumed his duties at Toyoda, Shimazu resolved to manufacture his very own motorcycle engines. Late in 1908 he left Toyoda Loom and returned to Osaka.

There, Shimazu's father worked as a precious metals dealer, and he gave his son a job as a clerk in the red lead shop, which produced and traded in the reddish oxide of lead used in glass and ceramics and also as a pigment in paints. (Shimazu continued working there as a clerk until the death of the shop chief, at which point he himself became chief.) "It was there," he recalled, "in a corner of the red lead factory, that I established the Shimazu Motor Research Institute" at the age of twenty. Shimazu had learned a great deal working with complex machinery under the tutelage of Toyoda Sakichi. The foundation of Shimazu's automotive engineering research was foreign catalogues and periodicals, such as the British *Motorcycling Manual* and the US *Scientific American*. After recruiting several expert lathe operators and finishers, Shimazu began producing the institute's first engine in August 1908. All the production capital

came from Shimazu's father, and by December of that year, the first model, a two-stroke, 400 cc engine, was completed. Shimazu remembered that he was "dubious about whether it would work, but it revolved well, and made about a thousand revolutions."[22] He then bought a second-hand bicycle from the Toyoda warehouse, attached the engine to it with metal sheeting, and demonstrated its capabilities for the residents and police patrolmen of the neighbourhood, who thronged to see it go.

Shimazu's next project was the production of a four-stroke engine, which is a more complex device. Two-stroke engines do not have valves to regulate the intake and exhaust processes, which simplifies their construction, and they fire on every revolution of the crankshaft (every two strokes of the piston), theoretically giving the engine twice the power of a four-stroke engine, in which each cylinder fires once every other revolution. Two-stroke engines are also lighter and less expensive to produce, but because their crankshafts, connecting rods, and cylinder walls are lubricated by means of mixing oil with the fuel, they produce more pollution. They also burn fuel less efficiently because some of the fuel-air mixture escapes through the exhaust port when the cylinder is loaded and because of the absence of a dedicated lubricating system like that of a four-stroke engine. Less efficient lubrication often results in greater wear of the engine's moving parts, which can cause more oil to be burned over time, leading to even poorer fuel efficiency.

Producing a four-stroke engine was a tall order, and Shimazu recalled being "so absorbed in the work that I neither smoked nor drank while researching it, and I made the frame myself." He studied foreign technical manuals, catalogues, and magazines intently, but because no metal piping was available to him, he assembled the chassis from used bicycle frames and metal sheeting as before. This, the second motorcycle built entirely in his shop, was completed in 1909, and he named it the NS, after his initials. In celebration, he bought himself a baked sweet potato for the princely sum of twenty *sen* (¥0.20). Based on the NS, Shimazu produced motors and chassis for twenty more units under the brand name NMC, which stood for Nihon Motorcycle Company, and sold them over the next several years for between ¥200 and ¥250 each. Regrettably, the frames often broke under their riders' weight on the city's poor roads. "Still," he recalled, "it was the nation's first domestically produced motorcycle."[23]

Undaunted, Shimazu expanded his research into motors, and in 1910, at the request of Osaka's Fushida Ironworks, he built a light, belt-driven, four-wheeled shop cart that was powered by a 6 horsepower engine. His younger brother,

Shimazu Ginzaburō, began to co-operate with him as a test rider. They named their prototype the Cycle Car but built only two more before abandoning the project. Early experimentation with motive power was a very fluid endeavour in the late Meiji period, and shops like Shimazu's often attempted a variety of applications for their engine designs. For example, Shimazu was called upon to assist two Japanese aviation pioneers with their aircraft engine in late 1910. He recalled:

> Just then, a leather wholesaler named Morita Shinzō from Osaka returned from his travels in Europe and America with an "aeroplane" engine as a souvenir. It was a Belgian-made, four-cylinder, 40 to 45 horsepower engine. Morita teamed up with a traditional arrow maker, who made a fuselage out of bamboo staves, and together they produced an airplane. Then, for some assistance with the engine's timing, they called me. It was a real opportunity to work with an aircraft engine, and ... [later] I made a three-cylinder, 25 horsepower aircraft engine at Tokorozawa City [in Saitama prefecture]. By the time I was twenty-four years old, I made a 1,200 rpm, 35 horsepower engine at the request of Baron Iga Ujihiro.[24]

Shimazu's experimentation continued in 1914, when he made a Renault-type V-8 engine, but the project took over a year to complete, and despite the large sum of money invested in the job, the bearings melted and the crankcase was damaged, rendering the motor scrap. His father encouraged him to get over his disappointment and to start again, but Shimazu needed a part-time job to raise the necessary capital. His fundraising solution was enterprising. In 1915, Shimazu made a four-stroke, two-cylinder, 10 horsepower engine, with which he built a fifteen-knot motorboat for launch in Osaka's Dotonbori River canal. His plan was to take people sightseeing, and he charged passengers ¥2.50 for one lap of the canal – at a time when one *to* (a roughly eighteen-litre/four-gallon barrel) of gasoline cost just ¥2. This business quickly earned ¥50 in profit. His second job was another 10 horsepower engine to power the electric generator of a silent-movie house. Shimazu's third effort was the production of over ten concrete mixers for Fushida Ironworks, for which he had earlier designed and built his Cycle Cars.

Funded by these efforts, Shimazu continued his research into engine designs. On 30 May 1916, he went to Tokorozawa City to participate in a contest known as the Aircraft Engine Manufacturing Competition, staged by Prime Minister Ōkuma Shigenobu (1838-1922), who was also the chairman of Japan's Imperial

Flight Association.[25] In this particular competition, an unrestricted engine was required to revolve, and the designers of the one that could run the longest were to be awarded a prize of ¥20,000. This was a substantial sum in an era when the average elementary school teacher's salary was roughly ¥20 per month.[26] Shimazu recalled that Matsuda Chōjirō, then the president of Orient Industries (later Mazda Motors), had planned the event together with other engine makers in order to exhibit their own products.[27] Originally, participation in the contest had been restricted to them, but Shimazu was permitted to enter a nine-cylinder engine that ran for four hours, and he won. To his surprise, however, he was told that it would take the contest sponsors four months to raise the prize money! This was something of an embarrassment because he and his team (his brother, Ginzaburō, and three employees) had just spent the last of the firm's budget on one-way tickets to the contest. Shimazu had been counting on winning the prize money in order to return to Osaka. Exactly how the team made it home he did not say.

With the prize money he was owed, Shimazu had first planned to build an airplane, but the future head of the South Manchurian Railway, Yamamoto Jōtarō, convinced Shimazu to open an automobile driving school instead. He started the Osaka Shimazu Automobile School in 1918, renting the Toyonaka City baseball field for instruction. For the purposes of driver training, Shimazu bought a Ford and three other automobiles from Yanase and Company in Tokyo (still a major automobile importer today), and he charged a student tuition of ¥200 for a three-month course of driving instruction and general automobile knowledge. Shimazu claimed that three hundred students graduated from his program over the next four years but noted that "there were only about two hundred automobiles in the greater Osaka area, and I was scolded for producing too many licensed drivers."[28] When the school closed in 1922, Shimazu returned to his other passion – motorcycle research.

For the next four years, Shimazu worked on a new motorcycle design, which he completed in early 1926 and named the Arrow First.[29] After completing six machines based upon this design, he decided to enroll four of them in a cross-country caravan from Kagoshima, on the island of Kyūshū, to Tokyo. This was a significant effort towards generating much-needed national publicity for the fledgling domestic motorcycle industry, and Shimazu benefited greatly from the help of sponsors and co-workers. After consulting president Murayama Ryūhei and director Konishi Shoichi of the *Asahi Shimbun* newspaper company and acquiring the co-operation of firms such as Japan Oil, Dunlop, and Bosch

Magnet, he and his brother set out on their journey with four other riders on 15 February 1926. Wearing khaki duster coats, all six left Kagoshima bound for Tokyo aboard four red motorcycles, stopping in towns and cities along the way to meet with local film and lecture associations, display their machines, and discuss automotive engineering with crowds of onlookers. The *Asahi Shimbun* covered the caravan in its pages, and readers in the Kansai area around Osaka and Kyoto were able to follow their progress as they neared Tokyo. When the riders called at Hiroshima they were hosted by Matsuda Chōjirō of Orient Industries, and they rested again for four days in Nishinomiya City in Hyogo prefecture. On 2 March, after a fifteen-day ride of nearly 2,300 kilometres (1,430 miles), all four motorcycles arrived, covered in mud, in the nation's capital. Shimazu's daring ride across the country marked a departure for Japan's transportation industry, and it made independent, motorized travel appear both more practical and more manageable than ever before. The idea of undertaking an endurance ride as a means of mechanical testing and corporate promotion was revisited by Japanese automotive engineers and entrepreneurs many times before 1960. As the first such caravan, however, Shimazu's odyssey on domestically produced motorcycles forever altered Japanese concepts of geography, distance, and individual mobility within the home islands.[30]

Following this trek, Shimazu worked for a time with Kawanishi Ryūzō, the president of the Kawanishi Aircraft Company, on several development projects. Here again is evidence of the close relationship between aircraft makers and those engineers working on other forms of motive power – a relationship that persisted well beyond the war era. In spite of their co-operation, however, Shimazu went bankrupt in 1926. Later in that year, he teamed up with Ōhayashi Yoshio of the Ōhayashi Group of firms to found Japan Motors Manufacturing in Osaka. At Japan Motors, Shimazu worked on turning his Arrow First design into a viable consumer product; after many modifications, he and his engineers completed a four-stroke, side-valve, 250 cc machine with a two-stage transmission. They produced between fifty and sixty machines every month, each with a retail price of ¥300. Shimazu reflected on the short but significant lifespan of Japan Motors Manufacturing: "I sold seven hundred motorcycles in three years, but the profit margin was insufficient to continue, and I closed up the factory. I was one of Japan's motorcycle pioneers, and among the first to provide the populace with a transportation facility [school], but owing to the fact that the timing was too early, as a business, it ended without bearing any fruit."[31]

It should be noted that, when considering the small size and limited means of the domestic consumer market that early manufacturers like Shimazu set out to supply, one must consider a company's monthly output as small or large in relative terms. The term "mass production" is often denied many Japanese firms of the first half of the twentieth century because they lacked four- and five-digit monthly production rates, although they were otherwise satisfying their emerging markets and shipping their wares nationwide. But for such enterprises, mass production on the scale of the contemporary Ford Motor Company was neither feasible nor necessary. The sixty units per month produced by Japan Motors Manufacturing were sufficient to satisfy the tiny market available, and the significance of Shimazu's accomplishment in terms of Japan's growing engineering capabilities must therefore be weighed in context. As for Shimazu Narazō himself, his career did not end with the demise of Japan Motors Manufacturing. After a brief period spent working in the electrical industry, he was hired by Matsuda Chōjirō to work for Orient Industries, where he later headed up another promotional caravan ride from Kagoshima to Tokyo. While at Orient Industries, Shimazu remained active in engine research even into his eighties, and claimed, "I patented about two hundred new and practical designs, but the triangular frame for three-wheeled vehicles is the one for which I am especially remembered."[32]

Shimazu had a remarkable career that spanned the earliest age of Japan's motorization, and his efforts as both an engineer and an entrepreneur are revealing. His account points to several key difficulties concerning Japan's rapid modernization in the early twentieth century: the scarcity of the quality manufacturing materials needed by mechanical engineers, the impediment of the nation's poor roads and city streets, and the challenge of obtaining both development capital and adequate production facilities. At the same time, however, Shimazu was careful to point out the support he received during his efforts at manufacturing motor vehicles for a newly mobilizing populace: the financial aid of his father, who encouraged Shimazu's research; the orders for motors and generators that he received from other businesses in the Osaka area; and the patronage of such firms as Toyoda Looms, Orient Industries, Kawanishi Aircraft, and the Asahi Newspaper Company. From his creation of Japan's first entirely domestically produced motorcycle to his nearly 2,300-kilometre journey across the country, Shimazu's achievements are historically significant despite the financial consequences that he suffered. While his technical ambition may

have exceeded his business savvy, and his pioneering efforts often ended in failure, his career sets an important tone for this book. The activities of more than a dozen other transwar automotive pioneers are examined in the same light in the following chapters. Pioneering ventures were undertaken at many points between 1908 and 1970, and many of them, like Shimazu's Japan Motors Manufacturing, made important technological contributions.

THE MIYATA MANUFACTURING COMPANY, 1881-1914

During the early years of the twentieth century, the Miyata Manufacturing Company had a pattern of development surprisingly similar to that of many of the motorcycle manufacturers that emerged following the Second World War. This is due in large part to its principal role as a munitions supplier in the early Meiji period. Miyata Manufacturing was established by Miyata Eisuke, who was born in 1840 in Okunitama, Fuchū City, in Edo (Tokyo).[33] He was a maker of archery bows, and after 1873 he also worked on equipment for making rickshaws. Thus began an engineering career and a family business that continued for many years to produce both munitions and vehicles of various kinds. In 1874, Miyata Eisuke moved to Morimotomachi in Shiba ward, where his second son, Eitarō, began working at the age of eleven as an apprentice at the Koishigawa Arsenal (on the site of today's Kōrakuen Stadium). In 1881, Eisuke opened the family's first shop, a gun factory with a two-storey storefront in Kobiki-chō, in Kyōbashi, Tokyo, which he named Miyata Manufacturing. Eitarō graduated from the mechanical engineering program at Kyoto University five years later, at which time the company's principal product was the Murata rifle for the Imperial Japanese Army. Following a brief recession in 1881 and an arson attack on the factory in January 1884 (for which the firm records no motive), the company recovered and began making knives for Imperial Japanese Navy divers, as well as guns for naval landing forces. This manufacturing experience benefited Eitarō greatly, and in 1887 he met with the head of the Osaka Arsenal and learned a great deal about the latest machinery used in the manufacture of arms.

From this point, the company's development took an unexpected turn. In 1889, a foreigner living in Japan came to the Miyata factory and asked if the workers there could repair his bicycle. It was not the sort of engineering job to which they were accustomed, but they managed to complete the necessary repairs. Their customer was evidently satisfied, for many more foreigners came to have their bicycles repaired at the Miyata plant. With time, this job grew into

a successful subsidiary business. Although the company broke ground on a new arms factory on 15 April 1890 in Kikukawamachi, Tokyo (on today's Shinjuku subway line), it continued to repair bicycles while producing about five hundred guns per month under the new name Miyata Gun Works.[34]

Rather by chance, the engineers noticed that the processes of making guns and bicycles were very similar: both involved the use of pipe, which was made right at the plant. Eitarō decided to try his hand at making his own bicycles – known at the time as *gaikokusha*, or "foreign vehicles" – and he and several employees built a prototype at the new factory. The frame was made from the same pipe used to make rifle barrels, and the company's engineers also made the saddle, chain, spokes, and ball bearings. Only the solid rubber tires were brought in from an outside manufacturer. In 1892, Japan's crown prince Yoshihito (who became the Taishō emperor in 1912) ordered the firm to produce a bicycle for him.[35] This encouragement brought both the firm and the bicycle industry an added degree of prestige, but the company halted bicycle production during the Sino-Japanese War of 1894-95 in order to produce rifles and bomb-lances exclusively for the military.

In 1900, Japan amended its hunting laws to permit the importation of cheaper, foreign guns. These imports overwhelmed the market, and Miyata's market share sustained a terrific beating. After the company's founder, Miyata Eisuke, died on 6 June, Eitarō decided to convert the business entirely to bicycle production. In that year, the engineers at Miyata purchased a Canadian bicycle and studied it closely. After changing the company's name back to Miyata Manufacturing in 1902, they built the first Asahi bicycle based on another foreign import – the British-made Cleveland 103. Direct technology transfer such as this was a process common to many of the industrial enterprises springing up throughout Japan in the late nineteenth and early twentieth centuries. Armed with foreign technical literature, an entrepreneur could often reverse-engineer mechanical products if the necessary materials were available. As was also often the case, the Imperial Japanese Army bought all of Miyata's Asahi bicycles for the Russo-Japanese War effort in 1904, which interrupted peacetime production until the end of the war in 1905.[36]

Production expanded following the war. Japan's Imperial Household Ministry placed an order for thirty-five Miyata bicycles, and the company also issued the first of its Pāson (Person) brand bicycles.[37] A variety of Japanese models with parts imported from Britain and the United States debuted at this time, and a

sales network of shops for Japanese, US, and British bicycles grew up via major dealerships in Osaka, Kobe, Nagano, Okayama, Kyoto, and elsewhere. Miyata's bicycles sold steadily around the country as the bicycles became a valuable tool for police forces, telegraph offices, post offices, shop delivery services, and media outlets such as newspaper companies. After 1909, Tokyo's famed Mitsukoshi department store began using a squad of eighteen bicycle messenger boys, and government agencies of all sorts incorporated bicycles into their daily operations. In 1908, Miyata began to export bicycles to various shops and dealers in Shanghai through a Japanese sales agent, and by 1915 exports were also reaching Singapore and Manila.[38]

Meanwhile, in 1907 Miyata Manufacturing began experimenting with automobile manufacturing, and it developed a two-passenger, air-cooled, two-cylinder car (also named Asahi) that was unveiled at the tenth annual Kansai Prefectural Association Exhibition in March 1910.[39] Fairs such as these, called *kangyō hakurankai*, or "industrial encouragement exhibitions," had begun during the late nineteenth century and were aimed at promoting initiative, pride, and technical capability in domestic manufacturing. Some of these events were general and others were industry-specific, but most involved a cash prize and public accolades for the victors – such as the Aircraft Engine Manufacturing Competition discussed above. Their highly influential role as proponents of both technical progress and entrepreneurial effort demonstrates the close co-operation between government and enterprise for the sake of Japan's industrial growth. In many cases, members of Japan's royal family and the nobility attended, and they often purchased those products considered by experts to be the best in show.

For example, in 1914 Miyata's directors decided to investigate the motorcycle for its product potential, and the company ordered a Triumph from Great Britain. Miyata's study of the machine took place at its steel-reinforced concrete bicycle factory built in 1912, which was equipped with electricity. After struggling to reverse-engineer much of the design and building the engine and carburetor themselves, Miyata's engineers issued a four-stroke, 3.5 horsepower Asahi motorcycle, while also constructing a four-passenger, liquid-cooled, two-cylinder car. Both were displayed at the Ueno Industrial Encouragement Exhibition in Tokyo in 1914, where the motorcycle was so well received that it was purchased by the Imperial Household Ministry and delivered ultimately to the Tokyo Metropolitan Police Department for inspection and further testing.[40] Miyata's expansion into motorcycle production is taken up again in Chapter 2.

MOTORCYCLE SALES AND MANUFACTURING

After 1900, motorcycles were gradually imported for sale to the public at bicycle and automobile dealerships from Hiroshima to Hokkaidō. One of the first such retail outlets in Japan was the Yamada Rinseikwan (literally "Yamada's Wheels of Success"), which was founded in Tokyo by Yamada Mitsushige on 11 February 1909.[41] Ōzeki Hidekichi (born 12 April 1897) was hired as a shop boy by Yamada in January 1921, and he became the president of the firm after 1945. When interviewed in 1972, Ōzeki recalled the company's early operations:

> No motorcycles were made domestically at that time, so all of ours were imported. Due to the First World War [imports were interrupted], but resumed afterwards with the importation of [British-made] Henderson, BSA, Rally, Triumph, Douglas, [and American-made] Harley-Davidson, Indian, and so on ... We began importing motorcycles from Brough Superior [in Nottingham, England] in 1920. We brought in ten units of this "Rolls Royce of Motorcycles," but they sold for roughly ¥2,000, while a Ford Model T sold for only ¥1,900, so motorcycles were more expensive. I think my monthly wage was ¥3 or ¥5 at that time, and from the age of twenty I was paid ¥7 or ¥10, so a motorcycle was absurdly expensive, and as a result we only sold one or two in a year. Mostly we made parts and performed repairs. We imported parts too, but a one-way trip by ship took three months back then, so for an order to arrive might take half a year – so we made our own.[42]

Ōzeki also recalled the many other dealers operating in Tokyo during the Taishō and early Shōwa periods, such as the Maruishi Company in Kanda, which imported Triumph motorcycles; the Auto Palace in Yūrakuchō, which imported British-made Douglas and Sunbeam motorcycles; the Hakuyō Company in Nihonbashi, which represented the German-made NSU motorcycle; the Irisu Company, which began importing BMW motorcycles in 1929; and the Mikuni Company, which sold Italian motorcycles by Moto Guzzi.[43] Mikuni makes carburetors today, but during the mid-1910s and 1920s these companies were principally retail and repair outlets, where even an inexpensive foreign motorcycle sold for between ¥400 and ¥500.[44]

As British, European, and American motorcycles were imported to Japan in increasing numbers, government ministries, the Imperial Japanese Army, and the Tokyo Metropolitan Police force began researching their use. The army, which had the authority needed to import vehicles directly from abroad,

ordered a Harley-Davidson motorcycle from Milwaukee, Wisconsin, in 1912, and purchased several more in 1917. Ultimately, the army chose Harley-Davidson's products over the Indian motorcycle (produced by the Hendee Manufacturing Company of Springfield, Massachusetts), because the former had a right-handed throttle control and hand-operated clutch mechanism. The Tokyo Metropolitan Police Department, on the other hand, preferred the Indian, as did many police departments in the United States at that time, because the left-handed throttle control permitted a right-handed officer to control his speed and still draw his sidearm.[45]

After Shimazu Motors and Miyata Manufacturing issued their first motorcycles, other entrepreneurs began to manufacture their own in bicycle shops, dealerships, and machine shops throughout Japan. As with many startup manufacturing endeavours of the Taishō era, documentation on this industry is limited and production figures are often unavailable. Some of the more significant efforts included the two-stroke, chain-driven, 300 cc Sandā (Thunder) brand motorcycle produced in Osaka by Watanabe Takeshi and Kuga Mosaburō in 1921, which sold for ¥380; the SSD, a 350 cc machine built in Hiroshima by the Shishido brothers Kenichi and Giitarō; and the 1,200 cc Giant, which was created by Count Katsu Kiyoshi in 1924.[46] Following the Great Kantō Earthquake of 1 September 1923, which destroyed many manufacturing shops and commercial enterprises in the Tokyo area, there was a critical shortage of automobile parts in Japan. Entrepreneurs therefore began to turn their attention to the production of both parts and finished motorcycles in an effort to fill the void. Count Katsu's love of automobiles inspired him to team up with Murada Nobuharu of the engine production company Tomono Ironworks to found Murada Ironworks in Tokyo in 1924. In the same year, Murada Nobuharu founded an important firm known as the Meguro Manufacturing Company. A year later, Murada welcomed Suzuki Kōji as his partner, and under this management collaboration the firm repaired cars and produced parts for the Triumph motorcycles then being imported by the Maruishi Company. Suzuki recalled that "many ex-navy men went into automobile repair and parts manufacturing in that era," due in large part to their technical training, their experience with machinery, and the growing number of vehicles on Japanese city streets.[47] This pattern of employment for former military personnel would be repeated after the Second World War, by which time Meguro Manufacturing had grown to become a significant motorcycle manufacturer (see Chapter 2).

POLICING JAPAN'S "MIXED TRAFFIC SOCIETY"

During the late Meiji era, the government began to study a bill aimed at improving Japan's road infrastructure. The expected cost was great, however, and the nation's ongoing military and economic projects were already significant. Since plans for a national railroad network had gone ahead, the bill was abandoned. By the early twentieth century, the steady proliferation of vehicles led to a pressing need for coherent government policies on road traffic, vehicle and driver licensing, and the policing of city streets. Not only was the use of motorized vehicles on the rise, Japan's roads were shared by increasing numbers of stagecoaches, oxcarts, rickshaws, cargo wagons, bicycles, and men pulling wagons or shouldering loads (Table 1). Moreover, in Tokyo electric trams had begun operating in 1903. As Andrew Gordon points out, the threat that trams posed to the livelihood of the city's twenty thousand rickshaw pullers was substantial – yet this was not the only conflict resulting from the proliferation of multiple forms of transportation.[48] The sight and the noise of motorcycles often spooked horses, causing them to bolt, and riders were therefore obligated to turn them off when encountering stagecoaches and other horse-drawn vehicles.

As motorcycles and other wheeled vehicles came to be used by the army, police forces, government agencies, and businesses during the 1920s, the era came to be known as the *kongō kōtsū shakai*, or "mixed traffic society." Adding to the obvious hazards posed by busy city streets, the rules of the road were often

Table 1

Wheeled vehicles in Japan, 1913-37

Year	Horse-drawn cargo vehicles	Horse-drawn passenger vehicles	Ox-drawn vehicles	Rickshaws	Motorized passenger vehicles	Motorized cargo vehicles
1913	178,368	8,581	33,090	126,846	–	–
1916	195,068	8,976	33,576	112,687	1,284	23
1919	244,805	6,827	40,587	110,541	5,109	444
1922	285,206	5,463	55,221	110,511	9,992	2,099
1925	306,038	3,905	66,308	79,832	18,562	7,884
1928	315,933	2,232	85,278	43,463	40,281	20,252
1931	296,560	1,545	94,960	36,618	62,419	34,837
1934	299,702	1,320	101,041	23,247	70,481	42,049
1937	306,793	1,096	111,146	15,376	75,740	52,995

Source: Tōkyō tōkei kyōkai [Tokyo Statistical Association], *Dai-Nihon Teikoku tōkei nenkan* [Imperial Japanese Statistical Annual], vols. 43-58 (1924-1939), as cited in Nihon jidōsha kōgyōkai [Japan Automobile Manufacturers Association], "Dōro kōtsū no rekishi" [History of Road Traffic], in *Mōtāsaikuru no Nihon shi* [Japan Motorcycle History] (Tokyo: Sankaidō Press, 1995), 145.

unclear, and while vehicle numbers grew steadily, traffic regulations did not. Accidents, therefore, became increasingly commonplace. Japan's government began recording national traffic accident statistics in 1925 (Table 2). Although parallel systems of traffic control and vehicle regulations had been in effect loosely since the Meiji era, they were issued haphazardly by Japan's regional and prefectural governments and were enforced solely by those local jurisdictions. In 1902, for example, the nation's first driver licensing system, known as the Passenger Car Regulation System, had been instituted in Aichi prefecture.[49] The following year, the Kyoto and Okayama areas both instituted regulations, and Nara prefecture followed in 1904. In 1907, the Tokyo Metropolitan Police Department developed its own system. All of these programs were aimed primarily at vehicles used by businesses, for private vehicle ownership had not yet become widespread. Tokyo's first real driving school, the Tokyo Automobile School, was established in 1914 at Gotanda Station.[50] By 1918, Tokyo had established a traffic police squad composed of one hundred officers and six motorcycles dedicated to the enforcement of the city's traffic laws. A special traffic patrolman's uniform was created by imperial edict in September of that year, and Tokyo's traffic police were given their own station where the city's traffic was busiest. Their motorcycles were painted red, and these *aka-bai*, or "red bikes," became the police department's newest law enforcement tools.[51]

In 1919, Japan's Home Ministry attempted to streamline the nation's confusing and inconsistent system of road traffic regulations by enacting the Automobile Control Ordinances. Appropriately for the day, the legislation defined automobiles as any motorized vehicle sharing roadways with pedestrians.

Table 2

Traffic accidents, fatalities, and injuries in Japan, 1925-43

Year	Traffic accidents	Fatalities	Injuries
1925	44,246	1,868	27,290
1928	55,533	2,321	36,854
1931	68,823	2,572	46,338
1934	69,343	3,226	50,204
1937	55,958	3,633	43,861
1940	30,777	3,241	26,417
1943	16,780	2,887	16,087

Source: Harada Tatsuo, ed., *Dōro kōtsū shi nenpyō* [Chronological History of Road Traffic] (Tokyo: Keisatsu jihōsha [Police Newsletter Co.], June 1982), as cited in Nihon jidōsha kōgyōkai, "Dōro kōtsū no rekishi," in *Mōtāsaikuru no Nihon shi* (Tokyo: Sankaidō Press, 1995), 145.

Table 3

Motorcycle driver-licensing restrictions, 1919 Automobile Control Ordinances

Type of vehicle	Engine displacement	Examination requirement	Age requirement
Motorcycle	Any	No	18
Motorcycle with sidecar	Any	Yes	18

Source: Nihon jidōsha kōgyōkai, "Unten menkyo no rekishi" [The History of Driving Licences], in *Mōtāsaikuru no Nihon shi* (Tokyo: Sankaidō Press, 1995), 179.

In an effort to protect pedestrians, the regulations differentiated vehicle and pedestrian lanes more clearly, and drivers were required to keep to the left and to use their headlights at night. Driver's licences valid for five years were made mandatory even for operators of "ordinary" vehicles such as motorcycles, passenger cars, and small trucks. The new legislation also clearly detailed accident responsibility and liability regulations, stipulating the penalties for infractions. Regarding motorcycle licensing, the vehicle regulations of 1919 required that the operators of motorcycles or motorized bicycles be at least eighteen years old and that they complete an application for a driver's licence, regardless of the vehicle's weight or engine displacement.[52] An examination was required for a motorcycle driver's licence only if the machine was equipped with a sidecar for additional passengers or cargo (Table 3). The regulations required all vehicles to be registered, to display licence numbers, and to be equipped with a speedometer and rubber tires. The maximum speed limit for all vehicles was set at a breathtaking twenty-six kilometres (sixteen miles) per hour!

ROAD DEVELOPMENT, "RIDING FAR," AND MOTOR SPORTS

Also in 1919, a road development bill aimed at creating a national infrastructure was sponsored by the government of Prime Minister Hara Takashi (1856-1921). The Road Law was passed in 1920, and the Home Ministry consequently launched the Thirty-Year Provincial Capital and Prefectural Road Improvement Plan. Thirty years was the estimated time that the prefectural governments would require to pave their main roads and to erect full-scale bridges across major waterways, thus creating a genuinely national roadway network.[53] This road legislation and the accompanying improvement plan helped foster a new age of recreational travel in Japan during the 1920s. Visits to local temples and shrines, as well as *onsen* (hot springs), had long since been a Japanese pastime. With the introduction of the motorcycle, however, groups of riders – often the

owners of dealerships and import firms – began to tour the countryside on two wheels. Riding a motorcycle in the 1920s and 1930s was difficult because the roads between cities and towns were typically unpaved, and even suburban streets became muddy quagmires after a rain. Because of breakdowns and accidents, as well as the threat of punctured tires, novice riders were often forbidden by motorcycle clubs to ride alone. Despite the challenges, however, Japanese with the necessary financial means were now able to explore their own countryside, villages, and farmlands.

With the launch of various specialty magazines in the Taishō era, such as *Mōtā* (Motor), *Mōtāfan* (Motorfan), and *Ōtobai* (Automatic Bicycle), a recreational culture based upon touring, known as *tōnori*, or "riding far," began to develop.[54] Many Japanese began to visit scenic areas on hiking and sightseeing trips, but because reaching such remote destinations by train was often impossible, the popularity of *tōnori* trips by motorcycle grew steadily during the 1910s and 1920s. Over twenty large motorcycling clubs and associations were founded throughout Japan during that period, one of the oldest of which was the Osaka Motorcycle Association, established in 1915.[55] This organization totalled 120 members by 1923, and enthusiast magazines often reported on group activities in motorcycle rides and rallies throughout the country.

Another early riding club, the founding of which was aided in part by Yamada Mitsushige, the owner of Tokyo's Yamada Rinseikwan motorcycle dealership, was the Tokyo Motorcycle Club.[56] Yamada's intent was both the encouragement of recreational riding and the cultivation of competitive motor sports as a means of spreading interest in motorcycles, excellence in racer training, and, most importantly, sales. These tactics were employed by dealers in Osaka, Nagoya, Tokyo, and elsewhere all over Japan, and just as today, when winners demonstrated the speed and reliability of their machines, sales increased.[57] Additional recreational riding clubs formed in Hiroshima and Nagoya during the Taishō era, and sales shops and dealers all over the country began to train riders and mechanics, which led to a vast expansion in technical skills.[58]

Motorcycles were featured at bicycle races in Ueno, Tokyo, in November 1910 and in Osaka in 1911 and 1912, but Japan's first true motorcycle race was held in 1913 near Naruo Bay in Nishinomiya, which lies between Osaka and Kobe. The track was the Hanshin Racecourse, a horse racing track. (Today it is the site of Hanshin Koshien Stadium, the home of the Hanshin Tigers baseball team.) Roughly thirty thousand spectators came to watch the first race at Naruo, which was a record for racing of any kind in Japan.[59] The sponsors of

the event included motorcycle clubs and associations, newspapers, racers and dealers, enthusiasts, amateur sportsmen, and volunteers. Such racing activity eventually helped fledgling Japanese manufacturing firms to make significant gains in the engineering and production of automotive parts and machinery.

Matsunaga Yoshifumi of the Japan Automobile Manufacturers Association recalled that the three "golden ages" of amateur auto racing in the interwar period ranged first from 1919 until the Great Kantō Earthquake in 1923, second from 1925 to 1927 at the dawn of the Shōwa age, and finally from 1930 to 1937.[60] In the first of these, the races held at Naruo were well attended. In 1925, a hundred-mile race was staged at Kagamigahara in Gifu prefecture, and a Tourist Trophy race known officially as the Tōkaidō 430-Mile Race was organized by the Kansai Motorcycle Club and held over a period of three days in May.[61] In 1926, a fifty-mile race held at Abegawa in Shizuoka prefecture featured one hundred participants and encouraged what Matsunaga recalled as even greater expansion of the sport. In an example of the interdependence of the news media and amateur racing, in October 1927 the New Aichi Newspaper Company in Nagoya sponsored an "800-Mile Race Once Around Central Japan" (*Chūbu Nihon 1-shū happyaku mairu rēsu*), which was naturally aimed both at boosting sales of its newspaper and at fostering enthusiasm for motorcycle racing. In addition to these sensational events, there were various races up mountains, around prefectures, and even an Ise Shrine Pilgrimage Race.

Another motorcycle racer who remembered Japan's interwar racing era well was Kawamada Kazuo, who later became the president of Orient Motors of Kariya, in Aichi prefecture. In the races at Naruo in the spring of 1925, Kawamada took first place in the 350 cc class, as well as fourth place in the top-horsepower 1,200 cc class. After the races, he recalled,

> An American came up and hit me on the shoulder. "Would you like to come and work at the Harley-Davidson sales office?" he asked. I jokingly replied, "Will you pay me ¥100 a month?" but I left for their Tokyo office for a visit anyway. At that time the monthly salary at a private university was ¥28, and at Tokyo Imperial University it was ¥30. At their office I was given some background on the monthly salary, and an American named [Alfred] Child came and said, "Depending on your results, we'll pay you ¥100 a month," and so I joined the company. A week later I won first prize at the Shinshū Matsumoto City Auto Race, riding a 1,200 cc Harley-Davidson, and they did indeed pay me ¥100. After that, for over two years I

travelled from Hokkaidō to Kansai and back, and in 1928 I was awarded the grand prize in Japan's first fifty-eight-lap race by Home Minister Mochizuki.[62]

One of Japan's very first bicycle and, later, motorcycle racers, was Tada Kenzō, who was born on 17 February 1889. His experience as one of Japan's earliest competitors in organized motor sports, both at home and abroad, is remarkable and deserves to be quoted here at length. When interviewed in 1972, Tada recalled:

I began as a bicycle racer, and started that at the end of the Russo-Japanese War, in 1905. That first race was once around Shinobazu Pond in Ueno [Park], Tokyo, which was a three-mile course, as the pond was bigger at that time. I was eighteen years old, and the prize was half a dozen beer glasses ... Afterwards I trained for the Komiyama Race as an apprentice, like a young sumo wrestler. I rode bicycles imported from America by the Ishikawa Company in Yokohama. I joined their racing team in 1907. The pace car at that race was a Triumph motorcycle. Most bicycles were imported then, and the Ishikawa Company brought in American Pierce and British Triumph bicycles ... I rode in a 250-mile bicycle race on 30 June 1907, and I won ... [In those days] various stages of the race were reported by telegram to the finish line. I won several races after that, and was reported on widely in the press. I was paid ¥3 per month by the Ishikawa Company, and I raced three-, five-, and ten-mile races. Ten-mile races were the "main event," and if I won, I was paid ¥10, and ¥5 for shorter races ... I moved up to racing motorcycles in about 1921. In the Taishō era I went to see the races at the Nakayama Racecourse. I bought a Triumph [motorcycle], which cost about ¥1,000 to ¥1,200, whereas a bicycle was only ¥120 to ¥170 ... I managed a bicycle shop then, which made its own brand, Mates [as in "friends"], and sold it there on the premises. Later this brand became Shinbashi Bicycles. I raced again in 1924, but I got no prize money in that amateur race, only a trophy. At that time, there were only about twenty motorcycle racers in the whole country ...

I read three British motorcycle magazines all the time: *Motorcycle*, *Cycling*, and *Motorcycling*, and therein learned about the Isle of Man TT (Tourist Trophy) Race. That was the age of ships, not of airplanes, so I went to Korea, then to Harbin, and then travelled to Europe by rail in the spring of 1930. From Paris I went to Dover, and it took about forty days in all to reach Man in May. I practised for a month for the race, which was scheduled for June ... I rode a British 350 cc Velocette motorcycle on the 420-kilometre asphalt course. A racer riding a Norton came

> in first place that year, while I finished fifteenth, and received a trophy ... I had some Western clothes, but at the prize reception photo shoot I wore a Japanese *haori* [half-coat], *hakama* [traditional, loose-fitting trousers], white *tabi* [socks], and felt *zōri* [sandals]. I went home via the Mediterranean Sea, through the Suez Canal to Singapore and then to Hong Kong before arriving home in Japan after a forty-one-day trip. Mine was the first overseas racing expedition to be completed, and it linked the racing community of Japan with the rest of the racing world.[63]

Tada Kenzō's account conveys the pioneering atmosphere in which he lived, worked, and competed. His solo adventure across the continents of Asia and Europe, undertaken simply to participate in a motorcycle race, is astonishing. It speaks to the extreme enthusiasm of the Japanese for motor sports long before the Second World War, an enthusiasm that played a significant role in rekindling Japan's motor vehicle industry after the war. In the Taishō era, motorcycle races, rallies, and caravans changed popular attitudes toward Japan's geography and to the concepts of distance, personal freedom, and the practicality of motorized transport. These changes represent a significant alteration of popular consciousness for ordinary people, who, just two generations earlier, had been expressly forbidden even to ride a horse.[64]

THE IMPACT OF JAPAN'S TRANSPORTATION REVOLUTION

The accomplishments of the Shimazu Motors Research Institute and the Miyata Manufacturing Company are tangible examples of an overlooked (while generally inferred) aspect of Japan's industrial growth after 1905. Japan's overall ability in the field of machine engineering improved after the Russo-Japanese War of 1904-5, but few case studies of contemporary small and medium-sized manufacturing companies have yet been undertaken. These pioneering firms are significant for two reasons: first, they provide important and specific benchmarks in the evolution of Japanese machine engineering of both parts and tools; and second, they are the foundations upon which a critical and diverse branch of automotive production grew in parallel to the truck and passenger car industries.

Shimazu Narazō's testimony speaks to the fluidity of Japan's earliest efforts at engine production. His experience producing motive power on land, sea, and in the air points to the ease with which a trained and experienced engineer could move from one manufacturing sector to another during the Taishō era. During his career, Shimazu worked on motors with no less than six diverse

applications: boats, aircraft, cars, electrical generators, cement mixers, and motorcycles. Before the 1920s, the engines used in motorcycles and airplanes were similar in design, and several contemporary motorcycle manufacturers in the United States also exploited this technological parallel. Experimentation with small engine technology was, in both industries, done largely by hand in small shops, and as the technologies of peace and war became increasingly interrelated, research laboratories came to be staffed by both academics and military officers.[65] Research on engines for both air and land use was conducted at such facilities as the Aviation Laboratory established at Tokyo Imperial University in 1918. The close relationship between the airplane and the motorcycle again came to have tremendous importance during the Occupation following the Second World War.

The rapid growth of the motorcycle industry during the Taishō era was due to substantially more than just the importation of a foreign technology by Japan's military and government agencies. Within a very short period, motorcycle dealers recognized the sales value of both recreational riding and competitive motor sports. Together with the newspaper companies and enthusiast publications in Tokyo, Osaka, Nagoya, and elsewhere, these entrepreneurs sponsored events at some of Japan's largest racetracks. The government was quick to grasp the value of such events for the nation's growing machine industries, and cabinet ministers often presented the awards to the victors. A significant web of interdependent relationships was thus formed; spectators, fans, the media, government agencies, industrialists, dealers, and racers together fuelled the growing enthusiasm for a vehicle that, for most, was still absurdly expensive. Arguably, this luxury quality made the motorcycle even *more* appealing, and as crowds of thousands were drawn to witness the races, those riding the machines were elevated to star status.

Tada Kenzō's account of his journey to the Isle of Man in 1930 demonstrates the level of enthusiasm for motor sports at that time, and Kawamada Kazuo's experience as a racer for Harley-Davidson hints at why he went on to found Tōyō Motors in 1949. A fire had been lit in the Japanese imagination, and by the interwar era, the motorcycle had become a significant focus of attention for public- and private-sector entrepreneurs alike. In the case of the Miyata Manufacturing Company, its evolution from a munitions supplier to a bicycle manufacturer and finally to a motorcycle manufacturer by the 1910s foreshadows the pattern of growth that later brought many other Second World War-era munitions suppliers into the field of postwar small-vehicle production.