

Spring 2022

## The Birth of the Bicycle: The Development, Aesthetic form, and Social Attitude Towards the Velocipede of the 19th Century

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The Birth of the Bicycle:  
The Development, Aesthetic form, and Social Attitude Towards the Velocipede of the 19th  
Century

Senior Project Submitted to  
The Division of the Arts  
of Bard College

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Annandale-on-Hudson, New York  
May 2022



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THE VELOCIPED MANIA—WHAT IT MAY COME TO!—(DRAWN BY THOMAS YERGEN.)

## Introduction

We live in an age of speed. The changes that the dawn of motorized transport have brought have revolutionized the potential of transportation, and as commercialized space transportation becomes a feasible reality for the future, the machines that initially changed the accessible world, have almost no choice but to be viewed by many as primitive. However, as engines become larger, and machines become more powerful, many are looking to human powered transport as a means of undoing the environmental and social damage inflicted by the widespread use of the car. According to a study by Deloitte a private consulting firm, nearly 3 in 5 private car trips in the United States are less than 10 kilometers.<sup>1</sup> All the while, only 13% of the U.S. population uses a bicycle for transport twice a week or more.<sup>2</sup> Encouragement of cycling would be a fantastic way to replan the brutally large and inaccessible infrastructural landscape of the United States. There are also arguments for the potential of the bicycle to fight obesity, to make public transportation more accessible, to combat climate change and oil dependence, and to make cities safer. The bicycle can account for the reconstitution of up to 199 billion miles per year currently performed by cars to miles on bicycles, could prevent up to 91 million tons of CO<sub>2</sub> emissions per year, and save up to 10.3 billion gallons of fuel per year internationally.<sup>3</sup>

Despite these promising statistics, the bicycle is quickly becoming evermore dwarfed by the power of motorized transport. The bipartisan infrastructure deal passed November 6th 2021 allotted \$110 billion for the maintenance of public highways, and while funding for rail and bus transportation is also allotted in the plan, no mention of cycling infrastructure is present.<sup>4</sup>

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<sup>1</sup> Lee, Paul, Jeff Louks, Duncan Stewart, David Jarvis, and Chris Arkenburg. "Cycling's Technological Transformation." *Technology, Media, and Telecommunications Predictions 2020*, 2019, 119–19.

<sup>2</sup> Buchholz, Katharina, and Felix Richter. "Infographic: Where Cyclists Are Going Places." Statista Infographics. Statista, June 24, 2021.  
<https://www.statista.com/chart/25156/share-using-bike-for-transportation-regularly/>.

<sup>3</sup> Gotschi, Thomas, and Kevin Mills. "Active Transportation For America; The Case for Federal Investment in Bicycling and Walking ." *Rails-to-Trails Conservancy* , 2008, 5–5.

<sup>4</sup>"Fact Sheet: The Bipartisan Infrastructure Deal." The White House. The United States Government, November 6, 2021.

<https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/06/fact-sheet-the-bipartisan-infrastructure-deal/>.

Despite this lack of attention from the federal government, a study from the League of American Cyclists (formerly the League of American Wheelmen) states that 60% of Americans support an increase in funding for the development of biking and walking infrastructure.

The bicycle is an internationally recognizable form of transportation, much like the car, train and airplane. The difference that sets the bicycle apart from other transportational machines is that it requires no more power to operate than a human already possesses within themselves. Such a simple machine is often viewed as primitive to many when compared with the immense power of other options, but the simple beauty of the bicycle remains quietly prevalent as a source of pleasure and primary transportation. In Copenhagen, Denmark, for example, 41% of journeys were taken wholly or partially by bicycle.<sup>5</sup> The form of the bicycle has also become a recognizable visual icon, and can be seen on a day to day basis around the world, as 42% of households own at least one bike, amounting to over 580 million bicycles worldwide. Despite this widespread cultural understanding of the object and belief in its potential for the future of transportation, it has only existed for the better part of the last two centuries. At its conception, the bicycle challenged the long established and trusted equestrian transportation system, similarly to the way the bicycle challenges the established use of motorized transport today. I seek to examine the bicycle through an art historical lens, in the same way as we currently examine architecture, or utilitarian objects, to build an understanding of the ways in which this object impacted society, how people grappled with one of the transportation methods that replaced the horse, and how it evolved into the popular visual icon that is so recognizable to us today. I will do this through the examination of visual and written culture surrounding the bicycle throughout the first century of its invention, including advertisements, cartoons, and first hand accounts from 19th century cyclists.

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<sup>5</sup> Lee, Paul, Jeff Louks, Duncan Stewart, David Jarvis, and Chris Arkenburg. "Cycling's Technological Transformation." *Technology, Media, and Telecommunications Predictions 2020*, 2019, 119–19.



## Chapter 1: The Dandy Horse

The years preceding the invention of the bicycle in Europe were extremely tumultuous. The Napoleonic wars of 1803 to 1815 resulted in grain shortages across Europe, which affected livestock heavily, and resulted in the death of many horses. In 1815, Mount Tambora, a volcano on Indonesia's island of Sumbawa erupted. The resulting environmental catastrophe reached around the world, hurling ash into the atmosphere. The event caused the global temperature to drop by half a degree celsius and caused blizzards and thunderstorms as far as Europe and New England, causing famine globally.<sup>6</sup> Some have theorized that it was these shortages that raised the question for Baron Karl Von Drais, a forester from the Duchy of Baden, present day Germany, in the early part of the 19th century, of how humans would be able to accomplish transportation without reliance on the horse. There are no direct sources from Drais accrediting this environmental catastrophe's influence to his ideas, he is however widely referenced as inventing the machine for his personal purposes of inspecting trees as a forester. While there is no direct evidence that the year without a summer and the Napoleonic wars had influence on the invention, it would be unwise to discredit the influence of such a catastrophic time in human history as being unrelated to the question of horseless transportation.

Von Drais took it upon himself to tackle this issue. He applied for a patent for a four wheeled, human powered machine in 1813, at the age of 28.<sup>7</sup> Drais had certainly seen human powered machines such as the garden phaeton, a machine used for leisurely transport around palace gardens, and powered by servants, but these machines were certainly too expensive and inefficient for any utilitarian function. Drais writes about such machines years later, stating;

“There have been earlier attempts to self propel a carriage via some machinery. But that machinery was ponderous in surmounting friction, complicated, and therefore never suitable for any

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<sup>6</sup>de Jong Boers, Bernice. “Mount Tambora in 1815: A Volcanic Eruption in Indonesia and Its Aftermath.” *Indonesia* 60 (1995): 37. <https://doi.org/10.2307/3351140>.

<sup>7</sup> Hadland, Tony, Hans-Erhard Lessing, Nick Clayton, and Gary W. Sanderson. *Bicycle Design an Illustrated History*. Cambridge, MA: The MIT Press, 2016, 8

noticeable practical use... In wartime, when horses and their fodder often become scarce, a small fleet of such wagons at each corps could be important, especially for dispatches over short distances and for carrying the wounded".<sup>8</sup>

These machines were large, and intended for carrying multiple people at an extremely slow speed. Von Drais' iteration of this vehicle is known as the Fahrmaschine, and its main advantage over the horse and carriage would be that it could function without the help of an animal which must be fed, but could by no means outperform equestrian powered carriages. The Fahrmaschine operated using a primitive drive system, in which one person would sit, facing the rear, propelling a wheel with his or her legs, while the second operator would sit facing forward, holding a vertical rod attached to the two front wheels acting as a steerer. While no images exist of an original Fahrmaschine today, it is easy to imagine that the vehicle would have been extremely large, cumbersome, lacking in dexterity, and difficult to operate, especially in tight spaces. Furthermore, there is no evidence that any kind of brake was employed, meaning the vehicle would have most likely been stopped with the feet or by gradual slowing.

The first widely recognized image of a bicycle-type machine was presented to the public through a pamphlet detailing Karl Von Drais' second invention. The Laufmaschine, or Draisinne, as it was coined by the press, was not the first of his inventions, and certainly not the first vehicle that required only human power, but it was the first recorded invention that was propelled by only one person, upon two wheels, making it also the lightest known "velocipede" (or human propelled vehicle) to date.

The Laufmaschine, rejected the earlier drive system employed on the Fahrmaschine, and was instead powered by kicking one's feet off the ground, and then lifting the legs up to coast on the two wheels which the rider sat in between. A steering mechanism moved the front wheel while the rider could rest their forearms on a padded platform, resulting in an upright position just as if one was running on foot. These first machines were made mostly of wood, with wooden wheels wrapped in metal, a similar

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<sup>8</sup> Ibid.

design to carriage wheels, and were about 27 inches in diameter. A brake, actuated by a cord mechanism was also included in the design , but was cleverly situated on the machine so that potential competitors could not recreate Drais' design. This brake design was new, and was not used on carriages beforehand, instead, horse powered transportation was either stopped by the horse, or by the operator's shoe when going downhill. From its conception, the Laufmaschine was offered in a wide range of design, including models for two riders, and models for women, which often had 3 or 4 wheels, and had a lower, more comfortable seat .<sup>9</sup>

Baron Von Drais released a pamphlet in October of 1817 which contained 2 images, one of them depicting a soldier, dressed in yellow, astride his new machine (fig.1). This image attempts to communicate elegance in design and practicality to the public, and through the image we can see the intentions that Von Drais had imagined for the invention, as not a toy or a hobby, as it would become, but a part of the soldier's uniform, a weapon, a tool, as if this modern soldier was a knight on horseback, the soldiers prestige affirms the machine, and in turn, the machine is an example of how new technology can be used, and the pair become a symbol of the military power which could potentially arise from this invention.

The image is extremely eye-catching, the two main colors in its palette are bright red and yellow, immediately drawing the viewers attention to the machine, and emphasizing the synergy between the machine and the rider. The pamphlet-illustration depicts the soldier, perfectly poised such that both legs are fully extended in his stride, yet neither of his feet touch the ground, as if he is effortlessly gliding through space. The soldier looks directly at the viewer, and his blushed cheeks give his face a soft and contented air, as if he is completely at peace as he strides forth, and he acknowledges the viewer with this glance, as if he is showing off his new machine.

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<sup>9</sup> Hadland, Tony, Hans-Erhard Lessing, Nick Clayton, and Gary W. Sanderson. *Bicycle Design an Illustrated History*. Cambridge, MA: The MIT Press, 2016, 15

In this image, the Laufmaschine is not depicted in real space. Of course, this may be for the purpose of drawing the viewer's attention away from any sort of distraction in the landscape, and instead towards the machine itself. In so doing, however, the Laufmaschine becomes an entity that is not hindered by the imperfect, physical world in which it would actually inhabit, but instead, floats in a white space, with no mud, no bumps or rocks in the road, and no hills to climb. Furthermore, the artist intentionally includes the rider in this image. The inclusion of the human figure has two purposes; firstly, to demonstrate the intended use of the machine. This would have been an invention that was previously unknown to most of the world's population, and as such, if the Laufmaschine was portrayed on its own, it would be nearly impossible to understand its actual intended use. The rider could in theory then, be any ordinary person. Secondly, the proposed archetype, the soldier, for the rider of this machine sets the precedent that this is a practical, reliable, and forward thinking machine that can be trusted by the military as well as by the general public.

Despite the thoughtful design of these machines, they did not catch the favor of the public quickly enough, and people moved on from excitement of the invention. With this shift, public opinion on the Draisinnes quickly fell into decline. This was primarily due to the fact that roads were not well kept, and riders of velocipedes were forced to ride on the sidewalks, interfering with pedestrian traffic. Just two months after the first good harvest following 'the year without a summer' the riding of Laufmashines was banned on sidewalks in the city of Mannheim Germany. Public opinion at this time teetered between admiration and distrust, and the poet John Keats critiqued the machine as "nothing of the day" while another American critic stated "every species of transatlantic nonsense, it would seem, is capable of exciting curiosity, no matter how ridiculous."<sup>10</sup> Another writer from Cincinnati gave the invention cautious praise, stating;

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<sup>10</sup> Herlihy, David V. *Bicycle: The History*. New Haven, CT: Yale University Press, 2006, 24

“There is no knowing what the ingenuity of this wonderful age might bring forth. There is no arguing against facts. So we will wait a while with patience-- assured if there is any use in the machines our enterprising coach maker, Mr. Work, will soon introduce them.”<sup>11</sup>

These quotes reveal that the velocipede was regarded as something new, strange, perhaps exciting, but yet to be proven as a reliable innovation that could truly become practical. The Cincinnati critic’s reference to the coachmaker Mr. Work also reveals that with no large-scale manufacturing in one specific location, the velocipede experiment had to be performed by many manufacturers worldwide.

In 1818, Drais released his catalogue detailing the different models available, and received patents for his machines in Baden and France. While the Draisienne took off with the French elites, and quickly became a tool for recreation, its practicality was doubted by the public. Different models of the Draisienne were developed in France, where it was commonly known as the Velocipede. French models employed more wrought iron in their design than the earlier, almost completely wooden Draisienes.<sup>12</sup> Drais rode his machine over 50 miles from Mannheim to Frankfurt, but received little attention for this feat, and the machine was criticized for the difficulty with which it handled muddy sections of road.<sup>13</sup>

Unable to find a manufacturer for his Machines, Karl Von Drais moved to Brazil to work as a land surveyor, but not before he was retired from his civil servant career in the forest service, named Professor of Mechanics by the new Grand Duke, and allowed to join two scientific societies for his achievements as an inventor.<sup>14</sup> At around the same time as excitement in Germany for Drais’ machine was dwindling, the Draisienne experiment continued to blossom abroad. A wealthy London coach maker named Denis Johnson decided to make his own, improved model of the the ‘Pedestrian Curricule’ as he named it, or hobby horse as it came to be known. After purchasing his own Velocipede abroad, Johnson applied for a patent and began production of his own design.

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<sup>11</sup> Ibid. 26.

<sup>12</sup> Hadland, Tony, Hans-Erhard Lessing, Nick Clayton, and Gary W. Sanderson. *Bicycle Design an Illustrated History*. Cambridge, MA: The MIT Press, 2016, 21.

<sup>13</sup> Herlihy, David V. *Bicycle: The History*. New Haven, CT: Yale University Press, 2006, 28.

<sup>14</sup> Hadland, Tony, Hans-Erhard Lessing, Nick Clayton, and Gary W. Sanderson. *Bicycle Design an Illustrated History*. Cambridge, MA: The MIT Press, 2016, 28

Denis Johnson's Pedestrian Curricule had a lowered middle section which accommodated larger wheels that could reach higher speeds and roll over larger bumps and obstacles, and also employed a French design, using more metal components to constitute the steering bars, which were affixed directly to the front wheel (as seen in fig. 2) .<sup>15</sup> Despite these improvements, the machine lacked a brake, this can be attributed to Drais' careful concealment of the brake mechanism on his models. A Johnson Velocipede cost £8-10, the equivalent of £590-740 today, well out of reach of the budget of an average person. Similarly to Mannheim, the public attitude towards wealthy young men riding the machines on the sidewalk was negative to say the least. Nevertheless, Denis Johnson was an avid hobby horse enthusiast, he taught his family to ride, and set up riding schools such as the one pictured in fig. 2, which were indoor rinks in which one could pay to learn to ride a velocipede, or to use the rink as practice, much like a skating rink.

This image of Denis Johnson's 1819 Pedestrian Hobby Horse Riding School in London demonstrates what these cycling rinks would have looked like. This large, well lit, indoor space creates a landscape in which the hobby horse can be enjoyed safely, without endangering oneself or other pedestrians. We can see that the space is simple, clean, bright, and allows for the rider to fully enjoy their hobby without getting caught in the rain or mud. Additionally, this image demonstrates a more popular public outlook towards the invention than we can acquire from Von Drais' pamphlet image of just two years earlier. Contrary to the pamphlet image, this is less of an introductory image, or an idealization of the then unrealized potentials of the invention, and instead shows the reality of how the machine was actually used. The men who ride the hobby horses in the school are pictured in a variety of different positions; the man in brown, front and center, is pushing along with a straightened back, relaxed, and at ease, while a blue coated man cruises at speed, with both legs up off the ground, seeming to get

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<sup>15</sup> Ibid. 23

comfortable on his hobby, while another has both legs extended outwards, like a beginner who hasn't quite found his balance yet.

At the perimeter of the riding rink, we can see a group of onlookers, including a child, who excitedly waves at a passing rider, as well as some women, who observe from a distance. All of the riders are men, we can see that at this early stage of the hobby horse, it was not popular, and most likely frowned upon for women to participate in the activity. Additionally, everyone that we can see in this image is very finely dressed, and looks pristine, with shining top hats, impressive large patterned dresses and hats with feathers, and are obviously wealthy enough to afford to attend the school or purchase their own Johnson Pedestrian Curricule. This depiction then potentially gives merit to the names "dandy horse" and "dandy hobby", as, to someone observing an image like this in the press, the riders of these strange machines may have been seen as pompous, silly and even laughable for spending their time in such a way, though this is not necessarily the intention of the image, and the image itself does not represent a caricature or mockery of those who ride hobby horses, but seems to inadvertently contribute to these stereotypes in the ways that it attempts to portray the subjects cleanly and elegantly.

Political caricatures depicting the shortcomings of the hobby horse became prevalent, especially after the British caricaturist Robert Cruikshank was involved in an accident with a man on a velocipede, resulting in a string of negative propaganda in newspapers, such as this image of dandies riding their machines through the mud (Fig.3)<sup>16</sup>.

The text at the bottom of the image reads:

"A new Irish jaunting car, the dandy's hobby, the velocipede or the perambulator, by which you can ride at your ease and are obliged to *walk* in the mud at the same time"

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<sup>16</sup> Hadland, Tony, Hans-Erhard Lessing, Nick Clayton, and Gary W. Sanderson. Bicycle Design an Illustrated History. Cambridge, MA: The MIT Press, 2016, 21.

Evident in this caption, this image aims to poke fun at the riders of hobby horses, it shows an open landscape in which the only figures pictured are astride their velocipedes, which would have perhaps been an overstatement of the prevalence of the machine, but acts as a visual tool to demonstrate the absurdity of a world in which everyone rides hobby horses. The riders, in contrast to the image of Johnson's school, wear ridiculously bright clothing, which comically flutters in the wind. The irony in this image is that these wealthy young men would dress in their finest clothing to then “walk in the mud” as Cruikshank puts it.

The velocipede is also represented differently in this image. For one, the velocipedes appear in much brighter colors, many of them being green, and one being red whereas not a single green or red hobby is seen in use at the Velocipede school. Additionally, the machines in Cruikshank’s caricature show more ornamentation. For example, the rider in blue in the front left of the image rides a velocipede which sports a windmill shaped ornament protruding vertically from the rear of the frame, reminiscent of a pinwheel or a child’s toy, and a completely imaginary addition that was certainly a conscious choice made by the artist. Similarly, the rider on the front right, dressed in orange, rides a velocipede with a horse shaped bust on the front of his machine. Decoration like this would have existed on some velocipedes, such as in figures 4 and 5, but it is important to note that this was another choice to represent this less common style of design in caricature, but not in descriptive imagery such as the Hobby Horse School.

The choices made in Cruikshank’s caricature make it clear that the aims of the artist were to create a mockery of the hobby, to represent the elitist groups who could afford the time and money to enjoy a machine that was at this point extremely impractical for the everyday user. Negative attitudes towards the riders of velocipedes at this time can be attributed to a general air of apprehension to the introduction of new technologies, as well as the way in which the machine was perceived as a leisure toy for the rich. This apprehension turns violent in some instances, such as in this 1819 caricature by Charles Williams (Fig.6).



The scene depicts a horse veterinarian and a blacksmith, who are both assaulting a dandy in the street. The dandy, laying on his back cries out

“ I swear by my stays, I will never have a hobby again! Don't now, You'll take all the stiffening out of my collar and frill”

The veterinarian, who stands on the dandy and is forcing him to swallow horse medicine from a very large syringe, replies;

“I'll only give you a dose to make you remember! and if I ever catch you again you will swallow all the contents of my shop!”

In Response to the doctor, the blacksmith, who is smashing the velocipede to pieces with a large hammer, says;

“That's right doctor, if we don't exterminate these hobbies, you'll never have to bleed or drench or I to shoe”

Meanwhile, we see an Ostler spearing a different rider in his behind with a pitchfork, exclaiming:

“D—n (Damn) you but I'll spoil your sitting! If the doctor can't get horses to dose he shall have assets to plaster! D—n me! I shall never have the opportunity of cheating a horse of his corn any more (if) these hobbies come in use.”

In the distance, two more riders turn away from the town, one calls to the other;

“Dick! Steer clear of the Blacksmiths in the next village and put up your Hobby where there is no stabling.”

In script at the bottom it read reads “The Anti-Dandy Infantry *Triumphant or the velocipede cavalry unhobby'd*” and a warning to these dandies is scrawled alongside;

“Then beware hobby horsemen, beware of your fate”  
“Dismount from your hobbies before its too late,  
For farriers, horse doctors, and horses providers,

Cry down wooden horses & down walking riders,  
Woah hobby, down hobby”

William’s violent, hilarious caricature is indicative of the attitudes towards the Hobby Horse during this period. The image is titled the *Anti Dandy* Infantry, indicating that the main qualm with these machines was not entirely the machine itself, but for the riders of the hobby horse, who, as in Cruikshank’s depiction, are portrayed as thin, brightly dressed men who wear tight fitting pantaloons and who are primarily concerned with their “collar and frill” This image praises the professionals, who are depicted as strong and powerful, in contrast to the dandies, who appear as stick figures, with impossible proportions that assert their weakness and frail build.

In addition to this comical stereotype, this image is rife with the fear of economic and social change that modernity could bring. The hobby horse may seem to be too insignificant of a piece of technology to be a representation of modernity, but this illustration demonstrates the impact on traditional transportation that such an invention posed, from the veterinarian, to the farrier, to the blacksmith. There is little to no evidence that hobby horses of the early 1800s were actually a threat to these professions, but perhaps Williams and those who shared in his ideals saw the potential disruption that such an invention posed. In any case, this image makes it clear that to many in 1819, the hobby horse enthusiast was to be mocked, hated and feared.

Along with these comical images, misinformation about the physical impacts of riding a hobby horse was circulated, including this 1837 criticism by Thomas Stevens Davies, who was for the most part a supporter of the Velocipede:

“Some cases were presented for admission at the public hospitals, arising from mismanagement and falls... Men who might have been perfectly secure if they had been content to go at an easy pace at

first until they got accustomed to the motion, would mount and try to run as rapidly as possible along a gravelly road full of loose stones, and suffered from the violent exertion”.<sup>17</sup>

The concerns regarding the health risks of these velocipedes are perhaps more understandable during this period, as bicycle design required vast improvement to become practical and comfortable. The machines of Drais and Johnson were extremely heavy and unforgiving over dirt and cobblestone roads, and the running motion was very harsh on the knees and feet, especially downhill. These primitive machines were not nearly as comfortable as the bicycles of today, and can not even really be considered bicycles in their current form, seeing as they do not use a drive system.

The period of 1817 to 1821 in Europe reveals how the velocipede was met with great fear and distrust. This can be linked to the flaws in its design, and also to the fact that society was heavily embedded in traditional modes of transportation, and was apprehensive to accept anything new. Public infrastructure such as paved roads to accommodate the velocipede did not exist, and at this time, the only people it could really serve would have been the social elites who were wealthy enough to afford and enjoy such a hobby. The terms hobby horse, dandy horse, dandy hobby, are all indicative of this social climate. Karl Von Drais dreamed of his invention being a practical functional device that would aid society, his image of a soldier atop the Laufmaschine is indicative of this. Drais, Johnson, and the other inventors of velocipedes would most likely not have seen themselves as artists or architects, but their inventions were, at their core, pieces of design which sought to benefit society, to act as entertainment both personally and through their exhibitions in races and in the news. In this way, bicycles of this period were a piece of visual and physical culture that the public was exposed to, and that the public was allowed to respond to. The largely negative response from the public in this period reveals that the public was not ready for this disruption. As I will examine in chapter 2, as the bicycle evolved in the 1860s, public attitude changed drastically, and the velocipede grew to be seen as a practical object that could be used on

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<sup>17</sup> Herlihy, David V. *Bicycle: The History*. New Haven, CT: Yale University Press, 2006, 25

a day to day basis, but as is the case in many movements, social, political, scientific, artistic, this shift would require development and time.

## Chapter 2 The Boneshaker and the “Ordinary” Bicycle

Inventors of the 1830s to 1860s proposed a variety of 3 and 4 wheeled vehicles to the market, attempting to grapple with the question of how to apply efficient **human power** to a vehicle. This resulted in a plethora of machines employing hand power and foot power. There was extensive knowledge in the period about how to drive trains via a system of shafts, but lack of understanding about how to effectively apply this to a lightweight, portable and fast vehicle. Additionally, a lack of consolidated small parts manufacturing made it so that anyone who was to make a machine would need to be a manufacturer of all parts. As a result of this, it was not until the 1860s that major innovations came to the hobby horse of the early 19th century.

One of the earliest examples of a mechanically driven bicycle came from an inventor by the name of Lewis Gompertz, who introduced a velocipede which included a system by which the rider's arms could drive the front wheel (Fig. 7).<sup>18</sup> This meant the rider could rest their legs and deliver more power with the additional mechanism, but they would be both cranking their arms and steering simultaneously. The awkward motion required was most likely why little about this machine is mentioned after its invention in 1821. While this machine does not lead directly into the bicycle as we know it today, this machine serves as an example of the various ways one could conceptually apply power to a machine. Despite the lack of success that Gompertz's machine enjoyed, it is important to look to this machine with admiration as potentially the earliest bicycle that could be powered without pushing off of the ground with the feet. A few interesting design details are included on this machine, firstly, we can see the influence of Johnson's machines with the dome shaped ornament which adorns the steering pivot (F) as well as the chest support (B) and the dropped middle section to accommodate for larger wheels.

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<sup>18</sup> Street Roger T. *The Pedestrian Hobby-Horse: At the Dawn of Cycling*. Christchurch, NZ: Artesius, 199, 154

A Frenchman by the name of Pierre Michaux is frequently referred to as the initiator of the “boneshaker” era with his 1861 invention of a Draisienne-like velocipede with the addition of cranks and pedals to the front wheel. This adaptation was important because it allowed the velocipede to be propelled using the feet, and without touching the ground, and can be considered one of the first bicycles as we know them today. This machine was still difficult to steer by modern standards, as it was frequently the front wheel which was driven and steered at the same time, which sometimes caused the front wheel to hit the rider’s leg as they steered. Additionally, these machines had an oversized drive wheel in lieu of a gear ratio to allow for higher speeds when pedaling.<sup>19</sup> Coasting with one’s feet on the pedals was also impossible seeing as the pedals would spin with the wheel. Pierre Micheaux played a great part in popularizing this new adaptation of the velocipede . Micheux’s velocipedes were quite expensive and took a long time to make, as demand was high, and all machines had to be made from scratch. Despite this, the Michaux company had issues with the quality of the frames, which, made out of cast iron, were impossible to repair once broken, and significantly weaker and heavier than wrought iron. Michaux’s business partners, the brothers Rene and Aime Oliver, would eventually push the reluctant Michaux to shift to working in wrought iron, after their competitors had done so already. Despite this, and the surprising fact that Michaux was not in fact the patent holder for his popular velocipede, the Michaux name remained one of the most popular in the French cycling industry for many years. The man credited as the owner of the patent acquired it in 1866, in the United States, and was known as Pierre Lallament, and stated that he had had the idea in 1862 while working at a manufacturer of children’s toys in Paris. Shortly after the development of the machine he returned to the U.S..

As multiple contenders fought for the sole rights over velocipede manufactory, patent issues began to take rise in the United States as well. One such “Mr. Calvin Witty of Broadway New York” purchased an older patent which described some of the features then in use in bicycles, and then contacted

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<sup>19</sup>MacGurn, James. *On Your Bicycle: An Illustr. History of Cycling*. London: Murray, 1987, 34-35.

multiple manufacturers throughout the United States, and while many ignored his claims, as many as 8 companies came to be controlled by Mr. Witty.<sup>20</sup> The example of Mr. Calvin Witty indicates that there was a growing cycling industry at this time, and that a plethora of bicycle manufacturers were beginning to thrive, predominantly across Britain, France and the United States. These new companies significantly contributed, through competition with each other, to the development of cheaper and more efficient means of producing high quality steel parts for bicycles. Despite this increase in manufacturing, the bicycle remained expensive due to the high demand for production, at least for well made machines made of iron, steel, and brass. While there are reports of cheaper bicycles of wooden composition being produced throughout the 1860s, we can see from many of the popular examples of the time that a machine made at least partially from iron was considered more durable, and there is not much representation of cheaper wooden Draisinne type bicycles. An exception to this rule would be the mostly wooden bicycles that were designed specifically for riding indoors, in halls such as the Pearsall Brothers “Gymnacyclidium”(Fig.8).<sup>21</sup>

In the late 1860s, the direct drive boneshaker became very prevalent, especially in Britain, France and the United States. We can see an example of such a Michaux style machine in this advertisement for “The First Gymnacyclidium” in New York City (Fig.8). In the advertisement, a man and woman ride side by side, gazing at each other with modest admiration, dressed in fine clothes and riding velocipedes that look very different from the hobby horse of 40 years prior. The key differences here are the application of the direct drive on the man’s bicycle, in which a crank system is affixed directly to the wheel of the machine, making the velocipede much more practical for transportation, seeing as the violent motion of propelling oneself with the feet off the ground was eliminated, allowing for a much more fluid motion such as that we today are accustomed to. Additional improvements to the machine have also been made at

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<sup>20</sup> “Velocipedes.” Brooklyn Daily Eagle, April 12, 1869.

<https://www.newspapers.com/clip/27948843/12-apr-1869-velocipedes-calvin-witty/>

<sup>21</sup> The Velocipede, Its History, Varieties and Practice. New York, Cambridge: Hurd and Houghton, Cambridge Riverside Press, 1869, 36.

this time, including the metal frame, and the metal spoked wheel, which was far stronger and easier to repair than its wooden precursor. The wheels on these velocipedes have also increased in size dramatically from the hobby horse of 1817, and while it is unclear in this particular image, boneshakers such as these would have frequently employed solid rubber tires in place of the metal covered wheels of their predecessors.

From this image we can see that by 1869 the Velocipede had become an extremely fashionable and popular pastime, enough to warrant the accommodation of “8,000 square feet for riding with gallery and seats for about 1,500 people”, a massive growth from the previous example of Johnson’s 1819 Hobby Horse Riding School, which, as shown in fig. 2, only could have accommodated a few dozen riders. The opening of the establishment seems to have been a major social event, with “Music by the Dodworth’s Band,” and, as mentioned, plenty of accommodation for spectators. In addition, it must not be overlooked that this establishment accommodated both male and female riders,(although it is unclear whether an unaccompanied woman would have been allowed to ride). In this image we can see that the design considerations for women’s velocipedes were much different than those applied to men’s models. Here we can see an example of an early indirect rear wheel drive on the woman’s velocipede, with a shaft system similar to the mechanics of a train. This system would later be replaced with a chain drive as we see on modern bicycles, but this is an innovation allotted specifically to women’s models at this point, demonstrating that there were concerns about the safety and modesty of women’s cycling, enough to employ a completely different mechanical design system. This adaptation was also most likely practical, to accommodate a large dress, which if too close to the wheel, could be torn or become stuck. We can also see that the front wheel has a dramatically reduced size to prevent accidents like this. Women during this period are infrequently shown riding a two wheeled bicycle such as this one, and this design does not seem to have been extremely prevalent, as many women would have opted for tricycles, which were seen as safer, more modest and more practical to accommodate for women’s fashion. Considering that there are representations of women on their bicycles, one would assume that there may not have been public



opposition to women's cycling, but this argument concerning the appropriateness of women's cycling did not become very prevalent until the 1890s, when women would begin to argue for more involvement in the cycling world. We can see from this particular image that while women may have been involved in cycling at times, the activity was expected to be performed with a man as opposed to independently.

The rise in popularity demonstrated by this velocipede gymnacyclidium is not evidence that the velocipede would have been accessible to everyone, a bicycle still required a great amount of money to afford, and one would have to learn to navigate a heavy wooden and cast iron boneshaker through muddy, uneven streets. Nevertheless, in an 1869 book *Velocipede, its Histories, Varieties, and Practice*, the current iteration of the machine is described as "locomotive" and is praised for its promising performance and design. The author states:

"In New York, no matter where you go, a velocipede is sure to whiz past you. The school-boy rides up Fifth Avenue, with his books strapped before him. In Broadway where stages, wagons, carts, trucks and carriages, clog the street from morning till night, the iron steed may be seen gracefully cutting its way among the larger vehicles."<sup>22</sup>

According to this source, in major cities the bicycle would have been unavoidable. It was in use not as a toy, hobby, or novelty, but as a functional means of locomotion that was well on its way to becoming *the* mode of transportation, at least amongst those who had the time and money to do so. This can be attributed to recent improvements in velocipede technology, especially the crank driven *bicycle*, a term that was coined the same year as the Pearsall brothers Velocipede Gymnacyclidium.<sup>23</sup> The term bicycle would have become necessary to distinguish it from other popular velocipedes, and demonstrates that the bicycle was popular enough compared to other velocipedes that it was beginning to be considered a different machine entirely. In an 1869 book "The Velocipede Its Histories, Varieties, and Practice" the bicycle, as compared to other "Various kinds of velocipedes, four, three, two, and one wheeled" is

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<sup>22</sup> *The Velocipede, Its History, Varieties and Practice*. New York, Cambridge: Hurd and Houghton, Cambridge Riverside Press, 1869.

<sup>23</sup> "Bicycle (n.)." Etymology, <https://www.etymonline.com/word/bicycle>.

considered “the most artistic, is altogether the most in favor, and steadily maintains its ground against all rivals”.<sup>24</sup>

The Boneshaker's growing popularity, and the anxieties that prevailed concerning its widespread use over horses is demonstrated in this caricature in *Harper's Weekly*, titled “The Velocipede Mania-What it May Come To” by Thomas Worth(Fig.9). In the image we can see a bustling street full of riders of velocipes who are carrying out their daily tasks. We see members of all social classes riding their velocipedes, men in fine suits and top hats, well dressed women being pulled along in three and four wheeled machines by servants, as well as delivery men, one carrying a basket on his back marked “Smith Baker” and another with a large metal vat, most likely containing milk. In the background we can see the negative repercussions of this “Velocipede Mania” a man with his arm in a sling steps out of a building marked “Velocipede Manufactory” having injured himself attempting to learn to ride, and directly next door sits a horse meat market, no doubt the only use left for out of commission horses, as evidenced by the third building on the street, a stable which has been boarded up, with a sign stating “to lease” strung up on the door. Many of the themes present in the 1819 Anti-Dandy Infantry caricature (fig. 6) are present, namely representations of the threat to horse transport and the livelihood of those involved, but a clear difference in this 1869 image from its 1819 predecessor is that social class is not represented as a defining characteristic of those that ride velocipedes. Instead of being a mockery of the privilege held by the hobby horsemen of the 1810s and 20s, the anxiety felt in this image concerns the widespread prevalence of this machine with all people. This indicates that at this point the machine has become a relatively cheaper and more accessible mode of transportation, that instead of being strange and ridiculous, it has real potential for becoming the primary mode of transportation of the later 19th century.

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<sup>24</sup> The Velocipede, Its History, Varieties and Practice. New York, Cambridge: Hurd and Houghton, Cambridge Riverside Press, 1869, 17.

Like in many cartoons, this image is certainly an exaggeration, as is evidenced in the title “what it *may* come to” but nevertheless reveals the feasibility of a revolution in transportation.

The boneshaker was a relatively short lived invention when placed in the grand history of cycling innovation, and steady improvements were applied to the machine until a wholly new velocipede that scarcely resembled its predecessor rose to wide popularity. This machine came to be known as the “Penny Farthing,” in reference to the size of the wheels, and their difference, one resembling the small penny coin and the other a large farthing. More frequently however, it would have been referred to as the “Ordinary Bicycle,” ordinary being a term used to distinguish it from the wide variety of other strange bicycles and velocipedes that were in use at the time. This high wheel machine with which many are familiar, was the choice for the majority of male cyclists as early as the 1870s, and was the most popular velocipede of all time until the invention of the safety bicycle.

This initiative to enlarge the drive wheel to such a proportion was only natural, with a direct drive system that lacks gear ratios, one can only go as fast as the wheel allows, seeing as high speeds result in a fast pedaling cadence, and it becomes difficult to pedal fast enough and keep up. With the large wheel of the ordinary, one could attain much higher speeds, as well as a far more comfortable ride, due to the flexibility of such a large wheel. The high wheel was also the most stable machine invented to date, and some have argued that it is more comfortable and stable than the modern safety bicycle, because the large wheel acts as a gyroscope that keeps balance even at low speeds. Other velocipedes of course still persisted at this time, as is evidenced from their differentiation from the “ordinary” bicycle. Tricycles and boneshakers were still very popular for women and children. This is indicative of a sort of elitism that surrounded the ordinary bicycle, as it was seen as the bicycle for sport, because it was capable of achieving the highest speeds, but was entangled with segregating ideas of gender, seeing as it would be impractical for a woman, wearing the fashion of the time, to ride the ordinary, and immodest for her to wear anything more practical. Therefore many major cycling clubs, or “Wheelmen” were predominantly male.

One such “wheelman” by the name of Charles Spencer wrote in an 1876 book *The Modern Bicycle* lessons for the new rider as well as the story of his **800 mile journey from Middlesex England to the northmost point of Scotland** with 4 other cyclists of the Middlesex Bicycle Club; “for the purpose of forming some idea of the distance which could be traveled on a bicycle without preliminary training and on ordinary turnpike roads”.<sup>25</sup> While the particular bicycles on which this feat was accomplished are not detailed, the author gives praise to the Coventry Machinists Company (noting that their mass produced parts are convenient to replace if broken) as well as the bicycle builder John Keene “the champion of clapham junction.” This, as well as some of the diagrams provided in the book (fig.10) give us some idea of the machines used to accomplish this feat.

We can see from this image that the bicycles in use were in a transitional period between the boneshakers of the late 1860s and the Penny Farthings of the 1880s, which would have had a significantly smaller non-drive (in this case rear) wheel.

On their journey across England and Scotland, Spencer and his fellow cyclists were met with curiosity, admiration and hospitality, there is no mention of any of the group having difficulty with finding accommodations, and were met with kindness wherever they went, save for one interaction with a farmer, who, in a drunk state, pushed one of the cyclists over, saying “Damn things shouldn’t be allowed.” Despite this, Williams' story demonstrates the public’s relationship with cyclists at the time. Many people at this point seems to have been quite well accustomed to seeing the bicycle around, either in the newspapers or in person, and even the disgruntled farmer seems to be at least familiar with the concept of a bicycle, as he does not seem to be surprised at the bicyclists, just annoyed. At the end of the journey, the accomplished wheelmen returned to southern England via train. The lack of provided information about

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<sup>25</sup> Spencer, Charles. *The Modern Bicycle: Containing Instructions for Beginners, Choice of a Machine, Hints on Training, Road*, 44.

their train accommodations for the massive bicycles that accompanied them is very interesting, seeing as there appears to be no trouble at this point in time when bringing bicycles on a train, and we can assume that a bicycle would not have been an unfamiliar sight on the railways.

Leagues of wheelmen were extremely important for the development of social policy surrounding cycling, namely the **construction of roads**. This was especially true in America, where rapid expansion led to extreme disconnects between settlements due to the poor quality of the roads. This issue was so prevalent that “It was cheaper to send goods by ship three thousand miles to Europe than to transport the same commodities overland for more than 30 miles”.<sup>26</sup> As the pastime rose in popularity through the 1890s “craze” cyclists became major political advocates. The League of American Wheelmen, established in 1880, drew in support through its non-partisan platform, which did not support Democrats or Republicans, but whichever candidate would offer support for the rapidly growing velocipedestrian population.<sup>27</sup> The group notably brought in great support for President William McKinley in his campaign for re-election in 1896. After presenting the candidate with a bicycle, they played an active role in his “front porch campaign” which was carried out in opposition to William Bryan’s “whistle-stop” campaign, on which he travelled the country by train in an attempt to connect directly with the American people. McKinley’s campaign hinged on the opposite principle, by which people, namely cyclists, would travel to his house in Canton, hear him speak, and then return to their hometowns and do the campaigning for him.<sup>28</sup> The McKinley campaign even went so far as to establish the “National Wheelman’s McKinley and Hobart Club, which sought to use cycling visual culture as a means for spreading political propaganda. The public, to whom cycling was becoming extremely fashionable, was very receptive to this strategy.

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<sup>26</sup> Mason, Philip P. *The League of American Wheelmen and the Good-Roads Movement, 1880-1905*. Ann Arbor, MI: U.M.I.

<sup>27</sup> Taylor, Micheal. *The Bicycle Boom and the Bicycle Bloc: Cycling in the 1890s*. 104. 3rd ed. Vol. 104. Bloomington, IN: Indiana University Press, 2008, 213.

<sup>28</sup> Taylor, Micheal. *The Bicycle Boom and the Bicycle Bloc: Cycling in the 1890s*. 104. 3rd ed. Vol. 104. Bloomington, IN: Indiana University Press, 2008, 220.

Despite this majority support for McKinley, the League of American Wheelmen remained nonpartisan, and were primarily concerned with cyclists and the rights of cyclists, one particular invitation to the club states that the club is inclusive of “All wheelmen who are interested in sound money, steady work, and good roads”. The groups at this point were extremely active as social events, and attracted many people from across the United States. In one 1895 meeting “thousands of ladies and gentlemen” attended at Asbury Park in New Jersey, where a parade was held and wheelmen from across the country stayed in hotels to enjoy the ocean. These were mainly social events, and various competitions were held, one winner being the delegation from Denver, who were proclaimed best dressed.<sup>29</sup>

Cycling competitions were also becoming more popular around Europe and America, and the L.A.W. was a major organizer of races, as is shown in this advertisement for the H.B. Smith Machine Co. (Fig.11).

The company uses evidence that many cycling championship winners have done so on a Star bicycle. The advertisement shows wild animals chasing after a dapper looking man on a bicycle, stating “‘And they followed the star’-(History)”. This slogan, an homage to many stories in which a star guides people, including the biblical tale of the wise men, is, of course, a play on words, as well as a comical, eye catching image that makes the viewer question ‘what could possibly be going on’ when confronted by this unusual parade. The advertisement then calls viewers to see for themselves that Star bicycles are championship winners, and questions; “Can any machine beat this record?”. While this information is limited to just three actual championship winners who happened to choose star bicycles, the ad takes a different strategy in marketing bicycles, as opposed to appealing to those who would be interested in the bicycle as a utilitarian object of transport or mild pleasure, it is a racing machine, rivaling even fast

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<sup>29</sup> “The National Meet of the League of American Wheelmen .” Scientific American, a Division of Nature America, Inc. , July 20, 1895, 35.

animals such as the goat, wallaby(?), and goose. This advertisement also promoted the newer form of this particular bicycle, in which, instead of the large drive wheel being the front wheel, it became the rear, trailing behind the smaller non-drive wheel. There would have been concerns surrounding this change in form, as we know, at this time the high wheel was commonly referred to as the ordinary, to set it apart from more experimental bicycles such as this one. The Star bicycle boasted more stability, as well as a safer design, which would make it more difficult to flip over the machine, and shows that, while the traditional penny farthing was the norm at this period, there was still experimentation surrounding the ways in which power can be effectively transmitted to the pedals, and the ways in which one could make the machine safe and appealing for *all men*, as opposed to only the dedicated wheelmen and athletes. However, this advertisement is also indicative of the kind of people that the ordinary bicycle was being marketed to; well dressed, athletic, wealthy white men. Not just this, but the listing of champions who give credit to the company are all male. The gendered restrictions imposed by the inaccessible design of the ordinary bicycle would soon be succeeded by the safety bicycle, which, as I will explore in the next chapter, replaced the ordinary with a frame shape that was practical and comfortable for women as well as men, and appealing to those who otherwise would not have picked up the hobby. The subsequent “craze” surrounding the safety bicycle led to more women fighting for their right to participate in cycling, which became a staple of day to day social life amongst those who could afford to.

### Chapter 3: The Safety Bicycle and the Bicycle Boom

The design of the safety bicycle of the 1890s revolutionized bicycle design; it also provided inspiration for the design of bicycles produced throughout the 20th and 21st century. The safety bicycle allowed for more people to gain access to the bicycle, including children and women. This resulted in a bicycle craze throughout the 1890s, wherein approximately 1.5 million people in Great Britain rode a bicycle, and the number of bicycle manufacturers in the United States rose to 300<sup>30</sup> <sup>31</sup>. This mass expansion of the industry coincided with social change throughout Europe and The United States, concerning women and their changing position within society. This discourse brought up questions of what exactly the “new woman” was, and how she was to fit into society, how she was meant to dress, and under which circumstances her public cycling was to be accepted, as the world rapidly changed as the turn of the century approached.

The Safety Bicycle is characterized by two new inventions which had not been seen on previous machines; firstly, the diamond shaped frame layout, and secondly, the Pneumatic tire. To pinpoint the exact inventor of the diamond frame would be extremely difficult, this is discussed thoroughly by Tony Hadland and Hans-Erhardt Lessing in *Bicycle Design, an Illustrated History*, who note that the first diamond frames were not necessarily a diamond in shape, but can be considered “diamond shaped”, because of the presence of “a toptube linking the steering head to the seat mount, a down tube linking the steering head to the bottom bracket, chain stays linking the bottom bracket to the rear wheel dropouts, and seat stays linking the seat mount to the rear wheel dropouts.”<sup>32</sup>

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<sup>30</sup> Rubinstein , David. “Cycling in the 1890s.” Essay. In *Victorian Studies* , 47–71. Bloomington, IN: Indiana University Press , 1977, 51.

<sup>31</sup> Rush, Anita. “The Bicycle Boom of the Gay Nineties: a Reassessment ,” June 6, 1983,1.

<sup>32</sup> Hadland, Tony, et al. *Bicycle Design an Illustrated History*. The MIT Press, 2016,160



To get an example of what an early “diamond frame” would look like, we can look to another early safety bicycle, the Humber Safety bicycle of 1884, a reproduction of which is shown in Fig.12. As we can see, the frame is hardly a diamond in shape, and truly more of a pentagon, but his example clearly follows the guidelines for a “diamond frame” proposed by Hadland and Lessing. The notable qualities that this bicycle expresses over the ordinary of the 1870s is the indirect chain drive, which allows for the rider to be seated low to the ground, and comfortably between the two wheels. In this model, we can see an emphasis on comfortable design, including a suspension seat which sits on a spring mechanism. Additionally, two small details in the geometry of the frame demonstrate the ways in which the body would be positioned on a bicycle like this. First of all, the length of the top tube, which connects the seat post bracket to the headset (steering) bracket, is extremely short, and we can see that the handlebars, which protrude from a acutely angled and extremely long head tube, sit just inches away from, and slightly higher than the seat. On modern bikes that are built for racing, considerations for aerodynamics result in the positioning of the handlebars lower than the seat, which would result in a tucked or hunched over position, and a long toptube, allowing the rider to stretch themselves out over the top of the bicycle. Secondly, the pedals sit almost directly underneath the seat, but the bottom bracket (the bearings on which the cranks sit) is positioned ever so slightly foreword, closer to the head tube than the seat is. These factors, in combination with each other, would result in a riding position that is extremely upright, allowing the rider to have a straight back, and sit in a position where he or she is almost standing. This consideration of rider position was extremely important to the Victorian cycling community, as demonstrated in Fig.13.

Victorian society was concerned with the health and comfort of riding positions and the rover safety caters to this desire with its extremely upright positioning. This strange geometry can also be seen as a replication of the position that one would assume on a penny farthing. Among polite society, an erect, comfortable position showed others that the wheelman or wheelwoman was at ease, properly composed for interaction with others, and a safe, cautious rider. Deviant cyclists, who slammed their handlebars low

for speed and power, were referred to as scorchers (fig. 13). In her essay “The Bicycle Boom of the Gay Nineties: A Reassessment,” Anita Rush shares this quote concerning a scorcher, who is described as “A hideous caricature of the real athlete,- a man who does not know how to use his muscles in a futile effort to appear as if he did”<sup>33</sup>. We can see here that the design of the rover safety was not one for these “scorchers” but employed a geometry that would be comfortable, modest, leisurely, and socially acceptable. These qualities of the gentleman rider were pervasive throughout cycling culture and amongst cycling-oriented social groups during the late 19th century.

While The Rover Safety (Fig.12) employs a chain drive system and a “diamond” frame, it can be seen that pneumatic tires are not in use yet, and this is one of the rare bicycles produced after the introduction of the diamond frame, and before the introduction of pneumatic tires, a period that lasted only 3 or 4 years. In this early safety, we can see that influence from the ordinary is applied, just like the ordinary, the drive wheel is considerably larger than the non drive wheel. As we will see in later examples, the safety came to look very similar to the standard bicycle that we are familiar with today.

But what is the Pneumatic tire? And why is it so important for the development of the bicycle, and modern transport overall?

The pneumatic tire as it is applied to bicycles or cars, like the diamond frame, was not invented at one particular time, in one particular form, but required many adaptations to become . The first inventor was a Scottish man named Robert William Thompson who, in 1845 introduced the rubber, air filled tire system for trains, and on some horse-drawn vehicles. This invention however was not successful and did not become widely used until it was reinvented, coincidentally, by another Scotsman, John Boyd Dunlop, whose name is still associated with the manufacturing of tires today, in 1887 (hadland lessing). After he used the system for his son’s tricycle, and patented it in 1888, the pneumatic tire was quickly applied to

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<sup>33</sup> Rush, Anita. “The Bicycle Boom of the Gay Nineties: a Reassessment ,” June 6, 1983, 10.

velocipedes. This adaptation of the tire is extremely important, and one could make the argument that the invention of the pneumatic tire is one of the most revolutionary inventions of all time, seeing as it allowed not only for the development of comfortable bicycles, but also for its critical role in motorized transportation.

These adaptations, including the chain drive, which had been in use on 3 and 4 wheel velocipedes previously, resulted in a bicycle which was comfortable to ride and approachable for many more people than with the penny farthing, including women, to whom this new, low to the ground safety was seen as to an extent, socially acceptable and safe.

As women from the middle and upper classes picked up the bicycle, the discussion of the suitability of the bicycle for women, and which suitable garments were to be worn, was not limited to just women, and the discourse was often weighed in on by male authorities who's were concerned about the safety of bicycles when considering reproductive health and the psychological effects of the bicycle on someone who, in the imagination of Victorian society, was meant to be a wife, mother or daughter primarily. Womens fashion at the dawn of the safety bicycle was, to say the least impractical. The corset, and the extremely long and bulky dresses that women were expected to wear at the time impeded women's ability to comfortably ride, and thus women pushed for an improved standard of clothing; namely lighter, slightly shorter dresses, and the health corset, also sometimes referred to as the bicycle waist. One Doctor Victor Neeson prescribed a short skirt ( four to eight inches off the ground) for cycling, alongside Bloomers, a type of loose fitting pant, stockings, and tights. Other authorities, such as the writer R.L Dickinson, a woman, argued for the sole use of long skirts, no less than 2 inches of the ground. <sup>34</sup>

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<sup>34</sup> Sims, Sally Ruth. *The Bicycle, the Bloomer, and the "new Woman": Images of the American Woman Awheel, 1890-1899*. United States: George Washington University, 1975, 131,132.

This image (Fig.14) is titled "The "New Woman " and her Bicycle- There will be several Varieties of her". The image bases itself around the central figure of the "new woman" who stands in front of a painting, titled "the old woman" who is pictured standing, in bulky old fashioned dress, atop a stool, trying to get away from a rat on the floor. The painting is executed in dull colors, and contrasts starkly from the "New Woman " who stands proudly before the painting, and confidently pays no mind to the three rats at her feet. The new woman wears cycling clothing; bloomers, knee boots, a jacket, tie and hat (interestingly, the shape of the new woman's torso is represented as impossibly small, as if she wears a corset, and does not appear as it would have actually in this attire). Surrounding this central image are depictions of "New Women" engaged in gender-stereotypical roles, astride or adjacent to a bicycle, and wearing this new cycling apparel. The archetypes presented are; The Servant-Girl, the Washerwoman, the Nurse-Girl, The Mother-in-Law, The Salvation Army Lassies, and the Widow.

This image provides insight into the public reactions to the adoption of cycling by women, and the changing fashion of the time. As we can tell from the language used in the title "There *will* Be several Varieties of her ", This image functions as a speculative example of what may happen in the future. We have seen other examples of this kind of speculation surrounding the future, as influenced by contemporary changes which invoked some form of anxiety in "The velocipede mania; what it may come to" (fig. 9). However, in this image of the new woman, there is no dystopian undertone which hints at the subsequent decline of society, although people surely felt that way about the new woman. Instead, this image does not seem to be saying anything inherently positive or negative about the future of women's role in society, except that it will most likely remain the same, but now performed atop a bicycle, in practical clothes for such a hobby. In this way, the image can be seen as one of cautious praise, accepting women will ride bicycles and fashion will change, however reassuring skeptical viewers that despite these changes, women will continue to be placed into restrictive, gendered categories of profession and social position, just as they were before. Underneath this positive facade that Puck presents to us, we can hear

the echoes of social panic, anxiety concerning the disruption of gender roles to which Victorian society was nearly inextricably attached.

We can get a sense of the ways in which women navigated this landscape from this first hand account written by a female cyclist by the Name of Grace E.S, who wrote this letter to the magazine *Bicycling World*, and was cited in the 1889 book by Robert P. Scott; *Cycling Art, Energy, and Locomotion*.

“Being a member of the L.A.W, I naturally see the *World* and I have beside me a copy of your paper, in which I notice an article on ‘Why a woman should ride.’ I agree with the writer that ladies should ride, and from my own experience ,I have found it improves my ‘health and complexion’ very much. I have only been riding since last June, but I am stronger now and enjoy living much better than I ever did before that time... It seems to give me life, and I feel the life-giving exhilaration born of this splendid exercise after I take my five mile run around the city, or, perchance the country... I sometimes get a trifle angry when I hear some old feminine fuss and feathers say ‘Oh isn’t that *disgraceful* to see a *woman* riding a *man*’s bicycle!’ They, I suppose, never read the papers as they would scarcely ever have the time after working, worrying, and scolding their husbands (if they are lucky enough to have one). If they could just for one hour have the pleasure of riding that I do, I think the cross, fretful, and worrying fits would be few and far between. I could not do without the bicycle now. Sometimes when I have been out I come home laughing, and as I trot my five year old baby on my knee, she sometimes says, ‘What’s happened that’s so funny? Tell me.’ And as I take her little hands and we fly around the room together, I feel that no woman on earth is as happy as I. Even after riding ten miles I do not feel tired, but come home feeling better than when I started. My husband is pleased that I ride, and here I will mention that in having a lady’s safety is that either can ride. I actually think sometimes that my bicycle is keeping me too young in actions, and I am not growing old gracefully as I ought to.

Now I don’t want anyone to infer from this that I am one of those strong-minded women that want to vote, and keep the men in petticoats. Oh, no, indeed! I am very well satisfied to let the men run this government as it is, or as it will be after March next.

“Grace E.S.”<sup>35</sup>

In this letter, we can infer firstly that women’s cycling was no small matter, and was written about in the press considerably. This is evident in Grace’s comment that if the old women who criticize women’s cycling were to read the papers, they would not be so surprised that women were beginning to

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<sup>35</sup> SCOTT, Robert P. *Cycling Art, Energy, and Locomotion. A Series of Remarks on the Development of Bicycles, Tricycles, and Man-Motor Carriages ... Illustrated*. Pp. 305. J.B. Lippincott Co., PA: Philadelphia, 1889.

ride bicycles en masse. This letter seems to be as much the writing of an enthusiastic cyclist as it is a plea for understanding from the largely male cycling community of the time, and uses methods of arguing for women's deserved place within cycling culture, by making the case that in her personal experience, the bicycle made her a better mother, that her husband was pleased, and that it was not to her physical detriment, and in fact made her feel better. Grace E.S. ends her letter by reassuring the reader that although she avidly supports women's cycling, she does not support women's right to vote. We can see here that women's right to cycle was entangled with the greater discussion on women's rights in general, and that there was an assumption that a woman who advocates for cycling is also in favor of further women's empowerment. With this in mind, Grace makes it clear that for her, the rights of women should go only as far as their right to cycle and dress accordingly. However, it is difficult to say whether this additional comment is indicative of grace's actual stance on the matter, or if (and it seems more likely that) her opinion on this subject is used as a means of making her argument for women's cycling more valid, by reassuring skeptical readers that women's cycling will not initiate a spiral towards women's empowerment including the right to vote. The sentiment of Grace's comments seem to be very similar to those displayed in "*The "New Woman" And Her Bicycle*", in the way in which it also asserts that changes in women's fashion and their access to cycling will not disrupt the stereotypes and expectations assigned to women during this period.

But what did women's cycling in this period actually look like? In his book chapter "*Women's Cycling Clubs and the Movement to Oust Women from a Boston Club*" Lorenz Finison explores the operations of the Woodbridge Cycling club, the first all-female cycling club in Boston, formed in 1891. In 1892, the group of 16 women at the time were admitted into the league of American wheelmen. As a part of their attempts to assert themselves as valid cyclists and members of the community, the Woodbridge cycling club performed Minstrel shows alongside picnic rides. These minstrel shows were considered standard entertainment of the time, but relied on heavily racist acts as a means of drawing people in. The Woodbridge club's 1894 fundraiser show for a larger club received media attention in the *Globe*, who

published an article on the event with the headline “ Two Dozen Black-Faced Girls”. This kind of performance was not out of the ordinary, other male lead bicycle groups in Boston produced shows followed similar programs, and the Woodbridge club likely collaborated with other clubs to produce a show that would not have been out of the ordinary<sup>36</sup>. By 1895, concerns amongst men began to arise about women’s place in the greater Massachusetts bicycle club. Making the argument that the glory days of the club had come and gone in the 1880s. While this was the case, it was argued by the female members that this decline of the bicycle club had already happened before the first women were admitted to the ranks of the organization. While male members were certain that the proposed amendment to prohibit women from joining in the future would pass, however it was not passed by an extremely thin margin, just two votes away from a two thirds majority. In the February 18th 1895 meeting record the author speculates;

“It is not stated whether the Anti-women voters will try to put (the amendment) through again or drop the matter and resign. It is supposed that a large number of them will resign. It is not stated either what the women will do. It must be plainly demonstrated that the best thing to do would be to get gracefully out. But it is probable that they will stay in and that the club will gradually disintegrate”<sup>37</sup>

However, neither party resigned, and the club split. The anti women faction, still being the majority, had the advantage of numbers, and those who supported women’s membership were forced to leave, subsequently forming another group known as the commonwealth bicycle club. The Boston cycling club, after successfully ousting women from their organization, went on to establish a new headquarters, which included 3 bowling alleys, baths, a billiards room and other amenities.<sup>38</sup>

The bicycle, while it did play some part in women’s rights, may not have played a leading role in women’s arguments for their expanded role in society, but rather served as a key point in the progression of the movement, and was concerned primarily with women’s right to cycle and dress freely. Many scholars argue that the bicycle was an integral part of the women’s rights movement, and that the 1890s

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<sup>36</sup> Finison women’s cycling

<sup>37</sup> Ibid 118

<sup>38</sup> Ibid 119

was the turning point at which women were completely accepted into cycling communities as complete equals. While I agree that the bicycle played an extremely large role in the shifting dynamics surrounding the position of women in society, it is easy to isolate certain pieces of evidence and not look at the entire picture. The fact of the matter is that the bicycle at this point was still something of a luxury item, and while it may have had a large impact amongst women who could afford to, and wanted to ride, the actual population of women who had access to bicycles was extremely small. Of course, it is important to look with admiration towards groups like the Woodbridge club, and the brave women and men who advocated for women's acceptance into the community. The story of the Boston Cycling club makes it very clear that even when women were accepted, they were met with such fierce opposition that they were eventually forced to leave the greater cycling community. We can also see that in an attempt to become accepted, they participated in and orchestrated events such as minstrel shows which actively degraded those who were not white, and it can be inferred with reasonable confidence that the rhetoric and performances included within these shows was reflective of a culture which also barred people of color or of lower economic means from joining the community.

At the same moment that these discussions of who should be allowed into the cycling community were taking place, a much different discussion was taking place, which was the examination of the bicycle not as a tool of leisure, used by elite men and women of the big city, but as a tool of warfare.

This Essay began with Karl Von Drais' imaginative image of a soldier astride a bicycle, an idea that would not come to fruition for nearly a century, when in the 1880s and 90s, military leaders across Europe and North America began to experiment with the use of the bicycle as a tool in combat. One of the first countries to experiment with the technology was, coincidentally in Germany in 1886, when the bicycle was experimented with as a means of transporting messages across the battlefield. Later, the bicycle would develop to take part fully in German military operations, as scouts and in various other



positions, and bicycles were supplied to battalions regularly<sup>39</sup>. The *Scientific American* of 1889 references this German experimentation and also mentions that the French at this point had enlisted a bicycle corps within their ranks. Interestingly, in the case of the French, an older style boneshaker bicycle is employed instead of the contemporary safety bicycle, and the British utilized (alongside the safety bicycle) a heavily modified machine for the transport of munitions which is shown below<sup>40</sup>.

In Europe, small, dense cities with well established roads likely resulted in more favorable conditions for the use of the bicycle as a tool in military operations that could be functional, and as a result, its use in Europe preceded its use in North America, where the vast, rugged landscape made the use of the bicycle in the military a dangerous and challenging feat. The Bicycle had made its first appearance within the ranks of the armed forces in 1891, at the Connecticut National Guard Maneuvers, where a drill was performed in which soldiers used their bicycles as a sort of makeshift cover by flipping their bicycles upside down and spinning the wheels to camouflage their location and fire rifles from the cover. Additionally, cyclists were tested as messengers on the battlefield at the National Guard Maneuvers; a relay line of soldiers atop bicycles raced against the usual method of the time, by which a cavalry soldier delivered a message to one station, which then relayed the message by a series of flags. The landslide winner in this test was the bicycle, who delivered the message a whopping 30 minutes faster than the flag signals<sup>41</sup>. The use of the bicycle was certainly in conversation between military leaders, Major General Nelson A. Miles reportedly said in 1892 that soon the bicycle would “become a most important machine for military purposes” in the next major war.

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<sup>39</sup> Fletcher, Marvin. *The Black Bicycle Corps*. Tuscon, AZ: University of Arizona, 1974.

<sup>40</sup> “The Military Bicycle.” *Scientific American*, November 30, 1889, 343.

<sup>41</sup> “Military Bicycling.” *Scientific American* 65, no. 12 (1891): 185–185.  
<http://www.jstor.org/stable/26104708>.

Lieutenant James A. Moss, who was appointed to lead the all black 25th infantry of Missoula Montana, was set on convincing his superiors of the efficacy of the bicycle within the U.S. Military. Moss did not have the greatest track record at this point, he had recently graduated at the bottom of his class at west point in 1894, and was likely appointed to lead an all black regiment as a result of this. Nevertheless, in 1896 after reading a bicycle drill manual, Moss began recruiting a bicycle infantry to begin field tests. Those who made the cut were selected for their prior experience handling a bicycle, though some were relatively new and had only ridden a few times before they were enlisted. Moss followed the drills that were proscribed in the manual that he had read, including exact procedures for mounting and dismounting in military fashion. After training, the 25th infantry set out on multiple expeditions geared towards proving the efficacy of the bicycle on tough terrain and unpaved or nonexistent roads. The first of these excursions was a (relatively) short trip to Lake McDonald Montana, a distance of about 126 miles over extremely rough terrain. This excursion, as well as subsequent tests, were performed with fully loaded bicycles. Including thirty to forty pounds of food and equipment, rifles and ammunition. Progress was slow, the group reportedly was forced to dismount and push their bicycles very often, as many as twenty times over a stretch of six miles at one point, as a result of the thick mud which accumulated on the bicycles and prohibited their proper operation. Tire punctures were another challenge to the infantry, as at this point the pneumatic tire was in use, however the inner tube that is utilized on contemporary bicycles was not yet in use, meaning that instead of replacement, all punctures to the tire, which was affixed via glue directly to the rim, had to be repaired on the spot instead of replaced, which was not always easy or even entirely possible, if the puncture was very severe. The group reached their destination at Lake McDonald on the second day, an amazing feat to anyone who is familiar with the difficulty of riding unpaved terrain on a bicycle, and impossibly more astounding considering the weight of the bicycles in use, and that the soldiers were restricted to only one gear. On the third day, Moss and the 25th infantry began their journey home.

The group embarked on a subsequent trip to Yellowstone National Park shortly after the completion of their first field exercise. Lieutenant Moss prepared extra repair kits and made alterations to the layout of equipment on the bicycle, including a rifle mount along the side of the frame, photography equipment was also included on this excursion, which produced fantastic first hand sources of the design of the soldiers uniforms and bicycles, shown below 224.

The group set out on their next endeavor, a distance of about 1,000 miles this time. Conditions were no better for this excursion, and as a result many more major repairs were needed, which were performed by various machinists and carriage makers that could be employed along the way. When the endeavor was completed, the group had travelled a total of 790 miles over 16 days, at an average of 6.25 miles per hour. Because of their success, Moss was certain that he had effectively proved the usefulness of the bicycle for long- distance, harsh terrain military transportation, but his superiors remained unconvinced; General John R. Brooke stated “ it would be impossible to take a bicycle corps of any size from place to place in a mountainous country without its being scattered and liable to be cut in pieces” While harshly critical, this is true, progress on these journeys was very slow, and on one particular journey, the group became fragmented in darkness, and had to relocate each other by firing their rifles and following the sound. This aside, the bicycle required thorough maintenance and made progress extremely slow. Brook, potentially in an attempt to appeal to his superiors, who were interested in bicycles, proposed they be used for messengers and for reconnaissance. An artist, Fredric Remington, observed the corps in action and provided his comments; “It is heavy wheeling and pretty bumpy on the grass, where they are compelled to ride, but they manage far better than one would anticipate”.<sup>42</sup> Moss went on to perform another official test of the capabilities of the bicycle in 1896, in which the Bicycle Corps scouted ahead of a military caravan to report on the condition of the roads, to assist carriages that had become stuck, and to report on the availability of water and potential campsites. This endeavour was seemingly the most successful of all the experiments, however, this still was not enough, and so Moss and the company set out

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<sup>42</sup> Fletcher, Marvin. *The Black Bicycle Corps*. Tuscon, AZ: University of Arizona, 1974.

on their final, and largest journey, a distance of over 1500 miles. Special bicycles were selected, made by the Spaulding company, and custom made supplies were ordered for the cyclists, including pans that were made to fit specially, and diamond shaped bags on the frame, similar to those shown in fig. 14 and 15. Details of the excursion would be too tiresome to recount fully here, but at this point, it seems that the capabilities of the bicycle had been demonstrated fully, and that this final, arduous journey, was more of an endurance test for the soldiers than it was a test of the capabilities of the bicycle. It took the Corps 40 days to travel 1900 miles. Moss still felt strongly that more testing of the bicycle would be beneficial, and that the bicycle *could* be used in military service, but the U. S army had seen enough at this point, and decided to pull funding from moss, forcing him to set up an informal bicycle corps at fort Missoula. Moss came to the conclusion that if the bicycle were to be used, it would not be a machine for the military to rely on fully.<sup>43</sup>

The bicycle would go on to be used in warfare, including during World Wars I and II, however its role in the 20th century was considerably different and would require a different essay to be explored completely.

The experiment of the black bicycle corps can tell us that by the 1890s, the bicycle that had started as a vehicle that was solely used for pleasure had become an exciting technology, which some envisioned as the transportation of the future. The simple, primitive and uncomfortable design of the wooden Hobby horse had evolved into a machine that under the operation of the right person, and with proper maintenance, could travel across vast distances, rugged terrain where roads are either extremely poor or even nonexistent, and provide valuable assistance to military operation through reconnaissance. This development did not change the world in the same way that locomotive, and motorized transport did, however the bicycle quietly became a supportive tool in military operations for some time, as well as the commonplace object that we know today.

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<sup>43</sup> Fletcher, Marvin. *The Black Bicycle Corps*. Tuscon, AZ: University of Arizona, 1974.

## Conclusion

This examination of the use and development of the bicycle in the 1800s reveals less about what the bicycle itself was, and is, and tells us more about the social climate of technological innovation, and the attitudes toward changing society that were held at the time. The bicycle was initially proposed to the public as a utilitarian object that would accommodate the quickly modernizing world of the 1800s.. Initially, the velocipede was something very strange, or even foolish, despicable and threatening to many people. The argument that disruption of horse transportation would result in the decline of society was present throughout the 19th century, from representations of the thoughtless dandy who foolishly pedals along, and cares more about his fancy clothing than he does the livelihoods of blacksmiths, ostlers and veterinarians, to the vision of what velocipede mania may come to, an apocalyptic future in which horses are lined up for slaughter, and deviant scorchers speed through the streets inciting danger and panic wherever they go. The use of the bicycle is also a lense through which we can examine the rapidly disintegrating gendered social etiquette of the latter 19th century. Despite the fact that the bicycle was a new invention, that did not yet have a full century to establish itself, the white patriarchy quickly scrambled to fabricate restrictions for women's full role in the cycling community, and the steep pricing of these machines, intentionally or not, created another kind of social elite, in which white male cyclists formed exclusive groups which held some political power, and participated actively in the exclusion and degradation of minorities. The black bicycle corps, while, unimaginably determined, strong, brave and generally admirable, should not be seen as an exception from this climate, as they were required to cycle under very different circumstances, and to them, cycling must have been a very small step in their military career, which was an extremely admirable dedication for a black person to hold in post Civil War America.

I end with the use of the bicycle in the military not because it was the most important application for the bicycle, but because it demonstrates how far the design of the bicycle came within a period of

under 80 years from its initial conception by Karl Von Drais, who, with his rudimentary machine, imagined a world in which humans relied on the power of their bodies to propel themselves into the future, he imagined a machine that was a part of its rider, a part of their uniform that could carry everything that they needed. I think that today, this allure of the bicycle remains the same. The freedom that the bicycle allows a person to have is completely undeniable, and during the latter 19th century, we can see a fleeting moment in rapid industrialization, a glimpse of a society that had begun to reject traditional systems of equestrian based transportation in favor of a machine, now rudimentary to most, but at the time a gleaming example of technological innovation and the streamlined design.

In these three chapters I have detailed the design of, and social attitudes towards, the velocipede of the 1800s. The revelations made by this research are surprising, as initially it is easy to believe that an invention as simple as the bicycle surely should have existed for far longer than the last 200 years. The invention and development of the bicycle reveals the ways in which modernization challenged long-standing traditions, and although it had the potential to make life easier and more efficient for many people, the bicycle was at first a radical new invention, reserved only for those who had means to afford it, and approached with cautious apprehension by other members of society. We can see that for the most part, attitudes towards cycling have improved considerably. The bicycle has become more than something new and strange, and is extremely familiar to many across the world. However, we can see reflections in contemporary society of the attitudes expressed by those alive in the 19th century, such as the notion that bicycles could again incite a transportation revolution, however this time, for the purposes of protecting the environment. On the contrary to this, one only has to look as far as YouTube to see the blind rage that some drivers and pedestrians fall into when in an encounter with a bicycle, and there are countless other examples of internet memes that playfully poke at cyclists for the small annoyance of waiting for a safe time to pass on roadways, however, this tension can sometimes become dangerous and even deadly.

Recently, a 16 year old was charged with a felony after hitting six cyclists with his pickup truck while attempting to “Roll Coal” or cover the cyclists with fumes from his exhaust. <sup>44</sup>

It is possible that the bicycle will remain, in comparison with the power of automobiles, a relatively minor form of transportation, looked upon with skepticism and even hatred by some, as it has been since its conception. However, as the global population rises, and the effects of urbanization intensify, we may see a future in which the simple bicycle becomes a machine of the future, of clean energy and a return to slow, intentional transportation. Until then, we can look to the examples set by the velocipede of the 1800s, as a means of navigating the ever changing climate of modernization.

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<sup>44</sup> <https://www.bicycling.com/news/a37808647/texas-driver-assaults-six-cyclists/>



Fig. 1 Karl Von Drais Pamphlet image of a Laufmaschine 1817<sup>45</sup>



Fig. 2 Johnson's Pedestrian Hobby Horse Riding School 1819<sup>46</sup>

<sup>45</sup> Magazine, Smithsonian. "This Wooden Running Machine Was Your Fixie's Great-Great Grandpa." Smithsonian.com. Smithsonian Institution, February 17, 2017. <https://www.smithsonianmag.com/smart-news/wooden-running-machine-was-your-fixies-great-great-grandpa-180962152/>.

<sup>46</sup> Science Photo Library. Accessed April 12, 2022. <https://www.sciencephoto.com/media/994571/view>.





Fig. 3<sup>47</sup> Caricature of dandys riding hobby horses through the mud, Robert Cruikshank, London, 1819



Fig.4 A Viennese hobby horse with the figurehead of a dragon, 1820s<sup>48</sup>

<sup>47</sup> "A Cruikshank Caricature." A Cruikshank Caricature - Director's Choice Uncut - Trinity College Dublin. Accessed April 23, 2022. <https://www.tcd.ie/library/exhibitions/directors-choice/cruikshank/>.

<sup>48</sup> "The Franco-German War on the Bicycle Origin." Love to ride my bicycle, December 29, 2015. <https://lovetoridemybicycle.wordpress.com/tag/celerifere>.



Fig.5 Hobby horse with a figurehead of a lion<sup>49</sup>

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<sup>49</sup> "1800s Hobby Horse with Ship's Figurehead of a Lion." The Online Bicycle Museum, June 18, 2021. [https://onlinebicyclemuseum.co.uk/1800s-dandy-horse-with-lion-figurehead/?tax=date\\_tax&%3Btid=103](https://onlinebicyclemuseum.co.uk/1800s-dandy-horse-with-lion-figurehead/?tax=date_tax&%3Btid=103).



Fig. 6 Anti Dandy Infantry Triumphant or the Velocipede Cavalry Unhobby'd, Charles Williams, 1819 <sup>50</sup>

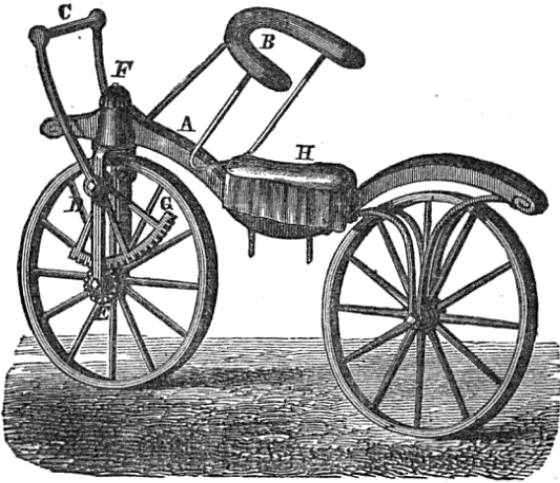


Fig. 7 Velocipede by Lewis Gompertz, 1821

<sup>50</sup> Williams, Charles. "Anti-Dandy Infantry Triumphant or the Velocipede Cavalry Unhobby'd." London: Thomas Tegg, 1819.



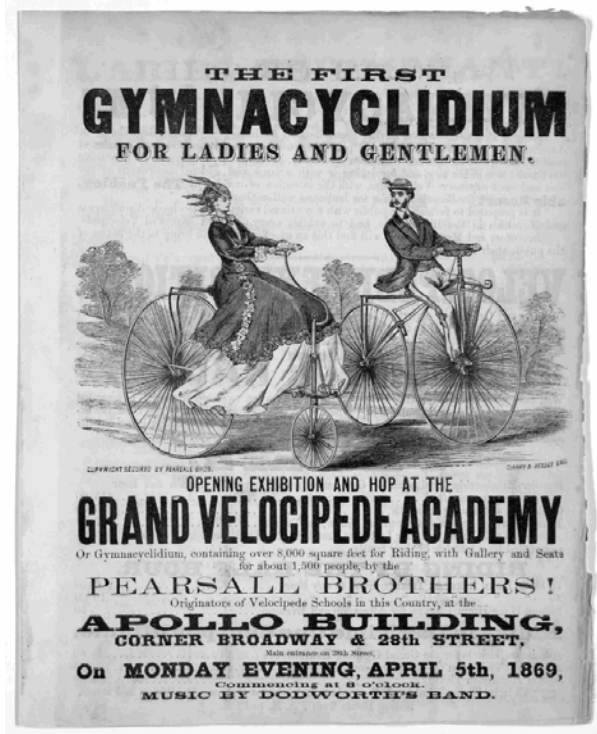


Fig. 8 The First Gymnacyclidium for Ladies and Gentlemen <sup>51</sup>



Fig.9 The Velocipede Mania, What it May Come To, Thomas Worth 1869 <sup>52</sup>

<sup>51</sup> Pearsall Brothers. The first gymnacyclidium for ladies and gentlemen: opening exhibition and hop at the grand velocipede academy, or gymnacyclidium, containing over 8,000 square feet for riding, with gallery and seats for about 1,500 people / by the Pearsall Brot. New York, 1869. Pdf. <https://www.loc.gov/item/98131173/>.

<sup>52</sup> Worth, Thomas. "The Velocipede Mania—What It May Come To!" *Harper's Weekly* . New York, NY: Harper's Weekly, 1869.



Fig. 10 Diagram of an Early Penny Farthing from Charles Spencer's 1876 book *The Modern Bicycle*

1 Nov., 1889 BICYCLING WORLD AND L. A. W. BULLETIN 21

**"And they followed the Star."**—[History.]  
 Look at the CHAMPIONSHIPS Won on the STAR during 1889. Can any machine beat this record? Facts that talk.

**Three-Mile L. A. W. Championship, May 30th,**  
 J. PHIL. PERCIVAL, Los Angeles, Cal.

**One-mile State Championship, May 30th,**  
 W. E. WING, Los Angeles, Cal.

**Five-mile State Championship, May 30th,**  
 W. E. WING, Los Angeles, Cal.

**Half-mile L. A. W. Championship, June 4th,**  
 COLLIE BELL, Ottawa, Kan.

**Ten-mile L. A. W. Championship, June 4th,**  
 COLLIE BELL, Ottawa, Kan.

**25-Mile Road Race Championship of Minnesota, July 31, 1889,**  
 COLLIE BELL, Minneapolis, Minn.

**Half-mile L. A. W. State Championship, July 18, 1889,**  
 W. I. WILHELM, Reading, Pa.

**One-mile L. A. W. State Championship, July 19, 1889,**  
 W. I. WILHELM, Reading, Pa.

**Quarter-mile L. A. W. State Championship,**  
 W. I. WILHELM, Reading, Pa.

H. B. SMITH MACHINE CO., - - - Smithville, N. J.

Fig. 11 Advertisement for the Star Bicycle of H.B Smith Machine Co.<sup>53</sup>

<sup>53</sup> H.B. Smith Machine Co. "And They Followed The Star'- (History)." *Bicycle World and L.A.W Bulletin* , November 1, 1889.



Fig. 12 Humber Safety Bicycle 1884 Reproduction <sup>54</sup>

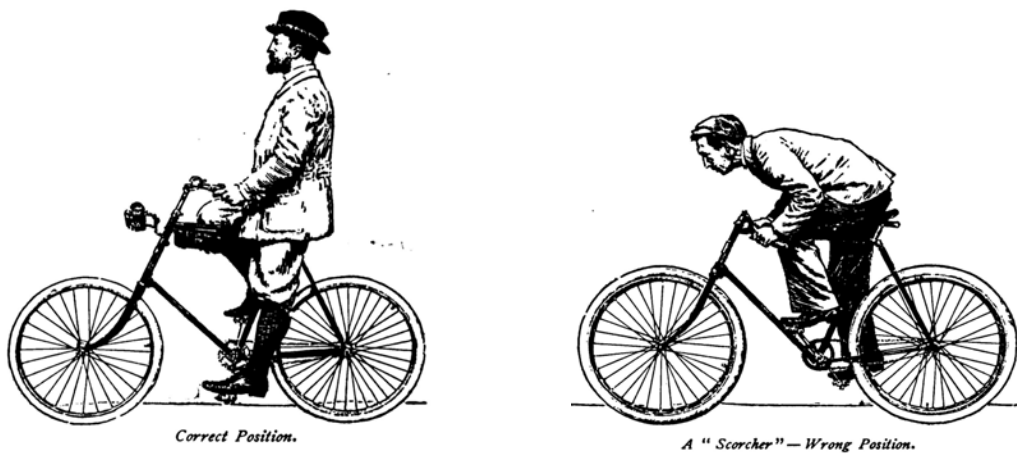


Fig. 13 Images Demonstrating the correct Victorian riding position, contrasted against “The Scorcher” or the undesired riding position<sup>55</sup>

<sup>54</sup> “Humber – the British Marque.” Automotive Brands, April 2, 2017. <https://kingsleysp.wordpress.com/2017/04/02/humber-the-british-marque/>.

<sup>55</sup>





Fig. 14 “The ‘New Woman’ and Her Bicycle.— There Will Be Several Varieties of Her” <sup>56</sup>

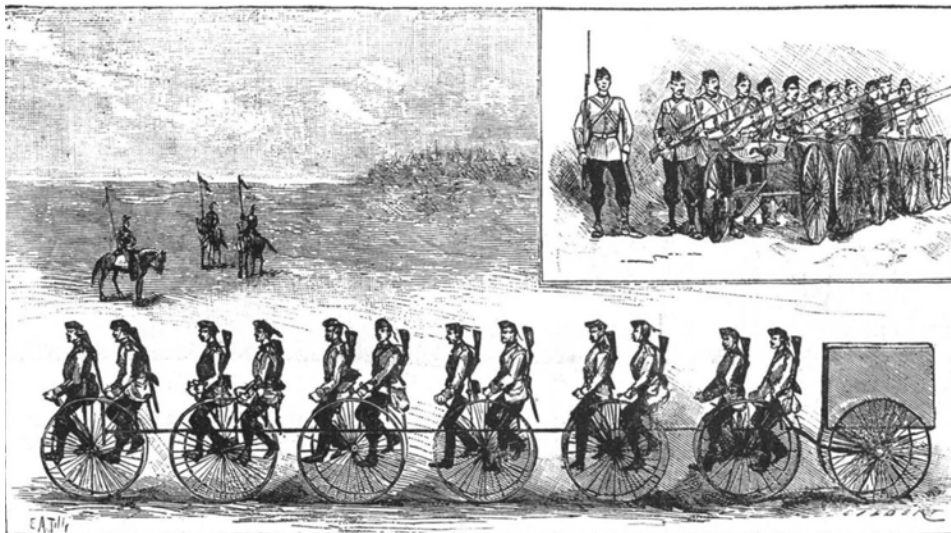


Fig. 15 British munitions bicycle, which seats a dozen riders in pairs of two, with a large box for ammunition being carried at the rear, 1889

<sup>56</sup> Opper, Frederick Burr, Artist. The "new woman" and her bicycle - there will be several varieties of her / F. Opper. , 1895. N.Y.: Published by Keppler & Schwarzmann. Photograph. <https://www.loc.gov/item/2012648801/>.



Fig. 16 The 25th Infantry posing at the sulfuric rock formations at Yellowstone National Park<sup>57</sup>



Fig. 17 A fully loaded military bicycle, including a bed roll, provisions, a custom frame bag, and a mount for a rifle<sup>58</sup>

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<sup>57</sup> "Buffalo Soldiers with Bicycles Pose on Minerva Terrace, Yellowstone National Park." Buffalo Soldiers with bicycles pose on Minerva Terrace, Yellowstone National Park. | U.S. Geological Survey. Accessed April 30, 2022. <https://www.usgs.gov/media/images/buffalo-soldiers-bicycles-pose-minerva-terrace-yellowstone-national-park>.

<sup>58</sup> Fletcher, Marvin. *The Black Bicycle Corps*. Tuscon, AZ: University of Arizona, 1974.



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