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PREFACE

Historians—as a group and as individuals—are innately curious. Their job is to engage a pile of cold facts then fix their analytical gaze on issues lying just beneath the surface that tend to escape broader consideration. In fact, historians often take note of events, things or people whom others might find mundane, uninteresting or even silly. But it is far more than a recitation or chronicling of fact and data or even a recounting of narrative. Historians challenge the records; they ask penetrating questions. They want to know what the facts mean, what they can tell us about our past, and hopefully, how history illuminates our present.

The History Department at University of Colorado at Denver and Health Sciences Center has made a habit of producing astute and curious history students who are unafraid to ask the tough questions and seek a broader understanding of our past. The academic year of 2006-2007 is no different, and this year's authors are as diverse as one could imagine. Our authors ask us to examine the effects of technology on our society from the way we paint our houses to the impact and meaning of the invention of the electric guitar on culture and gender. What role did technology play in shaping the Soviet Union and its economic policies as partially seen through the lens of literature? Politics and economics are well-known forces, but what role did they play in shaping the European perceptions of South America in the seventeenth century or wilderness in twenty-first century Colorado? And finally, what are we to do with the remnants of an industry overtaken by technology and economics? It would be difficult to imagine a more diverse set of authors and subjects, but they all share space in this year's *Historical Studies Journal*.

Much thanks goes to the faculty members who challenged and encouraged their students and submitted papers they thought worthy of consideration. A special recognition goes to Dr. Rebecca Hunt and Dr. Michael Ducey for encouraging students and reading page proofs. The authors put in a considerable amount of extra time and effort refining their citations and honing their writing. The editorial staff poured over submissions, then made thoughtful recommendations and revisions, all the while learning a great deal about the publication process. A special appreciation goes to Shannon Fluckey, graphic designer with Clicks! Copy & Printing Services, whose thoughtful creativity shaped the cover and who endured ridiculously short deadlines. And many thanks to Dr. Tom Noel for his expertise and support through the entire process.

The History Department at UCDHSC deserves special credit. For more than twenty years, the department has recognized the value the *Historical Studies Journal* provides students. Without the *Journal*, authors and editors would have fewer opportunities for practical publishing experience. We are all richer for the opportunities.

Paul Malkoski
Editor

PROGRESS IN A CAN:
An Examination of One Industry Through the Gilded Age and Progressive Era

Jacqui Ainlay-Conley

William Dean Howells's research of the paint industry and his familiarity with its technology added credibility to his widely read novel *The Rise of Silas Lapham.* When Bartley Hubbard interviewed Silas Lapham, the businessman exultantly described his paint as "a blessing to the world." Was factory-produced paint like Lapham's truly a blessing to the world? Rarely is a product or a process so perfect as to be considered a blessing or so completely bad as to be considered a curse. As with most advances of the industrial revolution, the rise of the paint industry and the increase in paint use was more of a mixed shade, not just the extremes of black and white.

The industrial revolution dramatically changed the United States. Large-scale production affected many facets of American life. Manufacturers, employees, and consumers reaped both rewards and challenges from increased industrialization. The development of the paint industry in the period between the Civil War and World War I provides examples of some of the positive and negative consequences of mass production associated with progress. This paper will discuss the benefits and drawbacks of the industrialization of paint manufacturing on workers, consumers, and corporations, and their reactions and responses.

Background of Paint Prior to the Industrial Revolution

Up until the 1880s, paint, especially in rural areas, was considered a sign of prosperity.[1] Master painters ground pigments and oil with a slab and muller, creating a colored paste that they would then meticulously mix with other colors, linseed oil or fish oil, and often turpentine. Knowing the ratio of pigments to oil, the combination of pigments needed to match colors, and processes such as whether and how to boil linseed oil, were all skills practiced by the master painter, a true craftsman. The master painter had to mix paint in batches to be used onsite because of a lack of ability to properly store the product without the liquids drying out. Painters then applied product in layers, each layer a different combination of ingredients.[2]

Jacqui Ainlay-Conley is studying for her MA in Public History with a Certificate in Historic Preservation. Her thesis work is on the New Deal and Public Health in Morgan County, Colorado. She wrote her paper for Professor Pamela Walker Laird's class, "The Gilded Age and Early Twentieth Century U.S. History, 1865-1932."

The movement away from the master painter and the expansion of the paint market occurred after the Civil War. This shift can be seen in books geared towards teaching tradesman, homeowners, and farmers how to paint. In 1868, writer and paint manufacturer John Masury published the influential *How Shall We Paint Our Houses?* Ten years later, lumber baron F.B. Gardner released *Everyman His Own Painter.* While Masury and Gardner still advocated hiring professional craftsmen, they explained how to mix paint, properly apply paint, and select colors. Both authors mentioned a new invention, the hand-cranked mechanical paint mill, a forerunner of what was to come. But more than anything else, the advent of small packaging changed the paint business just as it did other mass-produced consumer goods. In paint, companies such as Masury's began selling tin boxes of ready-ground pigment in oil. With the introduction of tight-sealing metal cans, paint pigment could be stored, shipped, and sold in large quantities.

Factors in the Increase of the Mass Production of Paint

The second half of the nineteenth century and the early twentieth century saw a tremendous growth in the paint industry in the United States. Manufacturers began producing ready-mixed paint—paint that could be applied straight from the can to a surface—around 1865.[3] By 1899, when the federal government first compiled statistics on the output of chemical commodities, manufacturers produced forty million gallons of paint, varnish, and lacquers.[4] By 1919, production of paint and related products rose to 109 million gallons, more than doubling in twenty years. Multiple factors contributed to this growth. Innovations in manufacturing, transportation, and publishing combined with a dramatic increase in the population, the rise in consumerism, and changing American tastes in aesthetics escalated the production and demand for paint.

Substantial growth in the population created a burgeoning housing market. From 1860 to 1880 the population of the United States doubled from 31,443,321 to 62,979,766 people and by 1920 the population had tripled from that of the 1860 census.[5] This market required more building supplies, which led to the development of new companies, and encouraged the development of mass-produced construction materials. Paint was one of those materials.

The growth of railroads opened new markets.[6] With the improvements in packaging and a railroad network that spanned the nation, companies in the manufacturing cities of New York, Chicago, and Pennsylvania could send their goods anywhere the trains traveled. Paint appeared on the exterior of rural homes in the south and even in the interiors of sod houses on the prairie.

The growing paint industry also benefited from the technological innovations in publishing.[7] Improvements in paper manufacturing, printing presses, and the invention of the linotype machine made printing newspapers, magazines, and books cheaper and faster.[8] The popular press financed through advertising and increased circulation replaced the newspapers of the political parties.[9] The growing number of daily newspapers in cities and weekly newspapers in rural areas carried paint advertisements. The new and improved technologies also brought trade journals and magazines. Companies

and industries produced trade periodicals such as *The Iron Age* and *Manufacturer and Builder: The Practical Journal of Industrial Progress,* which included paint ads as well as articles from respected authorities on how and what to paint. The *Ladies' Home Journal* included paint company advertisements geared towards homemakers as well as decorating tips. In addition, paint companies advertised through brochures and chromolithographs—the art of the masses.[10]

Changes in the U.S. postal system also helped the paint industry. Expanded mail delivery service and decreasing postal rates brought magazines and catalogs directly to consumers' mailboxes. The postal service began free home delivery in large Northern cities during the Civil War and by 1896 rural mail carriers began making the rounds. By 1910 one out of every ten Americans shopped from home using catalogs.[11]

In the second half of the nineteenth century, the United States saw a great surge in architectural pattern books and books containing color plates of possible paint combinations.[12] These books greatly influenced American taste in paint colors. Prior to Andrew Jackson Downing's influential *The Architecture of Country Houses,* most literature on building was aimed at carpenters and craftsmen. Downing and subsequent authors focused on future homeowners. Books on architecture often included suggestions of paint colors, but Downing's treatise started the movement away from the white house with green shutters. Downing first mocked the tradition of white paint in his earlier work, *Cottage Residences*. He wrote, "There is one color…frequently employed by house painters, which we feel bound to protest against most heartily, as entirely unsuitable, and in bad taste. This is white…."[13]

A self-trained landscape designer and architect, A. J. Downing profoundly influenced American aesthetics. Although much of Downing's material is unoriginal and can be traced to English sources, his success lay in his ability to write for a broad audience. Like the popular etiquette books of the Victorian era, he offered guidance to those seeking to improve themselves. His first book *Treatise on the Theory and Practice of Landscape Gardening* was reprinted fifteen times between 1841 and 1880 and his second book, *Cottage Residences,* had five editions and numerous reprintings. *The Architecture of Country Houses* was reprinted nine times and his final book, *Rural Essays,* a compilation of editorials from his magazine *The Horticulturalist,* was reprinted six times.[14]

Downing disapproved of exterior white paint as "too glaring and conspicuous…. We scarcely know of something more uncomfortable to the eye…."[15] He countered that natural colors like soft green were "the most refreshing."[16] Downing complained that white did not harmonize with the country landscape. He claimed landscape painters knew that white buildings ruined the harmony of landscapes, thus artists would "avoid the introduction of white in their buildings, and give them instead, some neutral tint—a tint which unites and contrasts agreeably with the color of trees and grass…."[17]

Downing suggested the houses should be painted in "soft and quiet shades" reflective of nature: fawn, taupe, grays, and browns. He advised homeowners against "positive paint colors, such as white, yellow, red, blue, black, etc…."[18] In 1861 John Riddell published what paint historian Roger Moss believes to be the first pattern book

of color plates—allowing homeowners to see the color possibilities on a architectural drawing of a house—with written instructions on how to replicate the colored combinations.[19] Riddell's choices echoed the Downing's suggestions.

With the new printing technologies, paint companies produced advertisements and sample cards of the muted colors advocated by Downing and other Romantic architects.[20] As architecture shifted away from the revival styles and their associated pale colors towards the Victorian styles of Queen Anne, Stick, Eastlake, and Shingle, colors became richer and deeper. The new styles emphasized materials, texture, and mass, something the new colors fit very well. Not only white but also natural tones became passé. In 1878, in his book *Modern Dwellings in Town and Country*, architect Henry Hudson Holly blamed Downing for encouraging homeowners to paint their houses the color of "mud."[21] At the turn of the century, the trend cycled back to light colors including white and off-white for trim.

Paint companies and industries associated with painting advertised or commissioned many of the books on paint selection and application. One of the first books published in America on house painting, John Masury's 1868 *How Shall We Paint Our Houses?* contained six advertisements: Masury & Whiton, manufacturers of white lead and painters' colors; H.W. Gear & Co., importers and manufacturers of artists' materials; McKessin & Robbins, wholesale druggists; Edward Smith & CO., manufacturers of varnish; Furnalds, Champion & Co., brush manufacturers; and the Judd Linseed and Sperm Oil Company. F.B. Gardner's 1872 *Everyman His Own Painter* included an advertisement for Valentine & Co.'s wood filling. In 1885 paint company Sherwin-Williams published *What Color?* and in 1914, the Lowe Brothers Paint Company circulated *The House Outside & Inside: How to Make Your Home Attractive*.[22] Given the innovations in printing and the growth of advertising one wonders how much influence paint companies had on consumers.

In *Victorian America: Transformations in Everyday Life,* Thomas Schlereth discusses in general the dramatic changes in consumers' behavior between 1876 and 1915. Attitudes towards material goods changed. As Schlereth sums up this new movement, "more people (middle class and working class) had more money and more time to purchase more goods, mass-produced more cheaply and advertised more widely."[23] Not only did consumers have greater access to goods and more pressure to purchase them, but also the attitude towards accumulating material wealth changed. According to Candace Volz in "The Modern Look of the Early-Twentieth-Century House: A Mirror of Changing Lifestyles," as American society moved from producer-oriented to consumer-oriented, restraint was no longer a virtue. This conversion can be seen in the media, which associated success with the accumulation of consumer goods versus the Puritan morality of self-denial.[24] This change benefited the paint industry. Not only did consumers use paint to embellish their homes, but also many of the new products on the market were painted, including toys, furniture, and other household items.

Negative Consequences of the Mass Production of Paint

Painting and the use of color became associated with the broad march of progress and democracy. The paint industry and architects like Masury touted paint as a symbol of societal advancement. He reasoned that paint "affords the best sign of the advance of a people in the path of civilization: for just as in proportion to the houses, fences, and outbuildings, are painted or neglected, will be the advance of that people in wealth, literature, home-comforts, in short, all the consequences and refining influences of a high civilization."[25] Not all the consequences of the rise of the paint industry, however, were positive. Increased mass paint production led to more opportunities for work in the application and production of paint, but it also led to the decrease in master painters, a specialized craftsman. Factory workers suffered the consequences of working with lead and around the highly flammable product. Paint of that era exposed consumers, especially children, to lead. Consumers questioned the reliability of paint and faced new problems—how to keep their newly painted surfaces clean as well as how to remove paint from clothing. Social commentators disavowed polychromatics as unnatural and too busy.[26]

Prior to the large-scale production of paint the master painter followed a yearly work schedule dictated by the seasons. Traditionally in the winter the painter ground pigments, in the early spring and late fall he painted interiors, and from late spring until late fall or when temperatures dropped he was able to paint exteriors. In addition to daily mixing paint, the trained artisan painted houses and signs, gilded, and could skillfully render imitations of wood and marble on surfaces.[27] The advent of pre-mixed paint meant the replacement of master painters by factory workers who manufactured the product and seasonal laborers who applied the coating. In "Causes of American Nervousness," George Beard lamented, "artisans, instead of doing or preparing to do, are restricted to a few simple exiguous movements, to which they gave their whole lives…."[28]

Increased specialization in the paint industry meant a decline in the apprentice-master craftsman relationship where novices traditionally had gained knowledge and skill by working with an established professional. This trend paralleled other industries. In 1929 Robert Lynd and Helen Merrell Lynd reported on the decline of the practice of apprenticing in their well-known survey of a typical small American city following the industrial revolution titled *Middleton: A Study in Modern American Culture*.[29] By comparing the results of the 1920 census to an 1891 statistical report the Lynds found that "one of the chief characteristics of Middleton Life in the nineties, this system [apprentice-master craftsman system] is now a thing of the past."[30] Like their working-class brethren in Middleton (really Muncie, Indiana), paint factory workers and painters all over the country became mere labor stuck in repetitious tasks.

Not only did the decline of the master craftsman mean a decrease in community stature, but the change also ceased the transfer of knowledge about inherent occupational dangers from master to apprentice. Master painters were well aware of the dangers of lead used in paint. Painters knew pigments could be ground dry but that by grinding them in liquid they could prevent dust in the air and thus protect themselves from the dreaded disease, painter's colic.[31]

In 1868 Masury wrote that potential customers need not fear the "poisonous property" of lead. He claimed that society had progressed far from when apprentices ground lead by hand in the winter in closed rooms. He assured readers that with modern processes "the white lead comes to the hands of the workman locked up, so to speak, in indissoluble bonds…no more deleterious to health than would be the same quantity of flour paste."[32] Unfortunately the worker who created the paste, and later ready mixed paint, still suffered, as did painters and ultimately consumers. Literate industrialists like Masury knew lead was very dangerous. Articles about the dangers of lead on workers appeared in contemporary trade journals and magazines.[33]

Only one year after Masury's book, a trade journal, *The Manufacturer and Builder*, ran an article titled "Diseases of Workers among Lead and Paint." Based on a series of reports from the *British Medical Journal*, the article quoted a British physician's description of the dire affects of lead on painters:

> *An attack of colic may occur now and again, and the painter will recover; but if he continues to follow his trade, the more serious diseases such as paralysis or kidney diseases, are almost certain to attack him at last, and to render him, if not entirely unable to work, at least so weak and prostrated that, in mental as well as in physical power, he will be but as the ghost of his former self. It is seldom that such workers are killed early in life; they lose power early, and soon become unable to perform a good days work; but they drag through their labor for many years, suffering always from general weakness. From the time that lead has contaminated their bodies, their lives are wearisome and joyless.*[34]

The medical journal suggested switching from lead to zinc or iron and acknowledged that while painters may not like the texture of the paint as much "that in other respects it is, we are told, as good as leaden paint." *The Manufacturer and Builder* "medical contemporary" suggested all employees wash their hands with turpentine, cut their hair short, wear caps, rinse their mouths out and remove paint from their hands before eating, wash several times a week in a weak turpentine solution, sponge off daily, drink lots of milk, and eat lots of fat.

New materials and products, along with the changing taste and preference of consumers, produced more contact with paint and thus lead. New industrial processes made iron and steel products more available and widespread. Because manufacturers and builders applied paint to prevent rust, lead paint appeared in unusual places. In 1885, the whole crew of a ship arrived in New York with lead poisoning. A doctor with the Brooklyn Board of Health determined that the source of poisoning was lead paint applied nine months previously to the interior of the ship's water tank. The doctor warned against using lead paint for such a purpose.[35] Manufacturers painted household products and even toys with lead paint. In 1877 author Thomas Bull warned mothers and nursemaids to keep painted toys away from young children, especially those who were teething, because if the toddlers sucked "off the paint, there is great danger of their health suffering from the lead which is thus swallowed."[36]

In addition to exposure to dangerous chemicals and substances, industrial workers toiled long hours in often poorly ventilated buildings around dangerous machinery. And of course there were fires and other hazards to workers, which often resulted in financial losses for owners and their employees. The flammable nature of paint and paint components made factories and related business operations highly susceptible to combustion. Between September and November of 1875 alone, five paint factory and related industry fires in Brooklyn appeared in the *New York Times*. The largest, at the paint factory of Baxter, Bell & Co., occurred on September 1. According to the *Times*, the fire, "owing to the inflammable nature of the contents of the building," destroyed the paint works completely within a half hour. The three-alarm fire ultimately destroyed the paint factory and a nearby lead works, and damaged a police station and brewery amounting to losses over $140,000.[37]

Paint presented consumers with many new challenges, some of them very basic. With little contact with paint prior to mass production, most users did not know how to care for painted surfaces or how to remove paint from fabric. Journals, magazines and home economics books offered suggestions. To remove paint from clothes the launderer should soften the paint in turpentine and then wash the garment in warm soapy water.[38] To clean painted surfaces some manufacturers suggested rubbing the surface with whiting or chalk dust, and then rinsing with water and drying with a soft chamois.[39] Some saw paint and other surface coatings as a new burden. In their 1912 book, *Increasing Home Efficiency,* the authors report on a homemaker who decided not to buy a bargain house when she noticed how much the modern finishes of mahogany and white painted enamel would ultimately cost her—two servants to keep them clean including herself.[40]

A more complex issue faced consumers, the ability to gauge product reliability. Employers developed relationships with master painters who personally mixed or supervised the mixing and application of paint. This relationship garnered a certain amount of trust on the part of the customer and obviously the home or business owner could easily see the quality of the product and workmanship. Paint distribution, like most mass-produced goods dissemination, often involved an intermediary. In the early years of ready-made color production consumers took their own containers to stores and bought in bulk.[41] They had to trust the shopkeeper had not adulterated the product in an effort to increase profit margins.[42] Once ready-mixed pigments and later ready-made paint came packaged, with no industry or government oversight, the consumer could be even less sure of quality.

The sights and sounds of those living during the rise of technology and consumerism dramatically changed. In 1881 Dr. George Beard wrote about the condition of nervousness in America. He argued that the increasingly fast pace of modern civilization, accompanied by the specialization of former artisans, technological advances and the acceptance of new ideas, overtaxed the nervous system of Americans, especially in cities. The proliferation of colors, pictures, and printed material including advertisements created what one author writing in 1884 called an age of "over illustration."[43]

Some social commentators and architects decried the use of bright colors including the flamboyant colors on the increasingly complicated architecture of the Victorian

homes. Victorians referred to the use of multiple tertiary colors—two secondary colors mixed together—as "parti-colored effects."[44] During the Victorian period, the Masury and Son Company, like its competitors, recommended the bright colors. At the turn of the century domestic architecture returned to Colonial Revival styles and the simpler primary and secondary colors began to replace parti-colors. By 1913 John W. Masury, who now ran his deceased father's paint company, printed *Planning the Color Scheme,* and the company once again encouraged consumers to paint in natural subtle tones. The junior Masury discussed the psychology of color, and almost affirming those who questioned the frivolity of parti-colors, he professed some colors had the ability to "quiet the nerves."[45] Some felt paint could be a soothing tonic to a chaotic world.

Positive Consequences of the Mass Production of Paint

Along with the real or imagined negative consequences of the industrialization of production and distribution of paint, owners, employees and consumers reaped many benefits. The successes of the paint manufacturers exemplified those of other contemporary industrialists: new markets, new products, new technologies, and the rise of corporations. A growing population found work while a growing number of American consumers could afford to purchase and apply an increasing variety of paint products.

The paint industry benefited from the growth of large-scale iron and steel production, especially the railroads. Paint covered farm machinery, ships, iron girders and trusses used in construction, railroads, and later cars.[46] During the early stages of industrial development, manufacturers often employed their own in-house mixers but most eventually turned to ready-mixed paint.

Railroads and railcar companies became one of the largest consumers of paint products. How connected was paint to the railroad industry? Sherwin-Williams, which grew to be one of the largest paint corporations, opened a factory in Chicago in 1888 to be near the Pullman Company.[47] Contracts proved to be very lucrative. In 1907 chemist, paint authority, and writer Maximilian Toch credited one railroad, which he did not name, with purchasing over one million dollars of paint a year.[48]

Like most industries of the time, many paint manufacturers engaged in the research and development of products in hopes of creating new markets and encouraging more sales. The industry started with pre-mixed colors and pastes sold in bulk that required the addition of oil and then began to package product individually in cans. Enhanced production methods, which improved the ability to finely ground pigments, coupled with experiments with additives, resulted in the creation of emulsions—true ready-mixed paints. From there companies expanded to provide paints for specialized uses: floor paint, brick paint, ceiling paint, interior paint, exterior paint, and even roof paint. Some manufacturers added slate or cement to their roof paint to repel fire, a serious concern of home and business owners.[49] Many paint companies and entrepreneurs engaged in the quest to find the elusive fire-poof paint. One company introduced their offering with, "Water and fire, good servants as they are, as long as under our control, are the most terrible masters when entering our dwellings against our will."[50]

In order to research and develop new products, Sherwin-Williams hired the first known professional chemist to work solely for one paint company in 1884.[51]

Earlier in the same year, Henry Sherwin and Edward Williams dissolved their partnership with A.T. Osborn—known as Sherwin-Williams & Company—and the two incorporated as The Sherwin-Williams Company. The employment of a chemist and the incorporation by the paint company are indicative of changes in the business practices of the paint industry and other industrialists after the Civil War.

In order to finance ventures and limit liability many businesses owned by individuals or partners incorporated. Other new powerful paint empires emerged: Lucas, Devoe, Seeley Brothers, and the National Lead Company.[52] The move away from owner-managers to corporations changed the administrative structure of businesses; corporate organizations divided responsibility and control leading to a new hierarchy that included middle managers and specialized employees. For example, corporations hired accountants, developed in-house advertising, and employed factory managers.

While specialization can be viewed as negative for laborers, this trend provided opportunities for college-educated men to join the middle class. Universities established formal training programs in fields like architecture and engineering. This movement can be seen in literature. Publications on paint expanded from how-to books marketed towards potential house owners and tradesmen to books aimed at educating professionals. Maximilian Toch wrote *The Chemistry and Technology of Mixed Paints*, a technical manual, for the "progressive manufacturer." In his preface, he acknowledges his book "is intended for the student in chemistry who desires to familiarize himself with paint, or the engineer who desires a better knowledge of the subject, or for the paint manufacturer and paint chemist as a work of reference. It is not intended for those who have no previous training in the subject."[53]

Changes in manufacturing, especially the mechanization of production in factories, characterized the growth of industrialization during the latter half of the nineteenth century. Advances in how paint was made and colored provide an example of one industry's increased efficiency. Paint production moved from the craftsman shop and work site to factories as machine mixing of paint and pigment replaced the hand mixing with slab and muller. Where master craftsmen used to apply experience and trade lore, educated engineers and chemists applied science and new technologies to the production of goods.

A typical paint factory stood three or four floors high. With machinery and manufacturing processes in multi-story facilities, the manufacturing process began at the top with pipes conveying the paint downward between production stages. Eventually belts and later electric motors replaced human power to drive mixers, grinding mills, and conveyor belts preparing greater quantities of paint with fewer workers.[54]

While linseed oil remained the chief liquid medium in paint, the pigments and means of producing pigments became more efficient. For example, white lead, the most ubiquitous of pigments and paint bases of the era, had been produced for over 2000 years by the Dutch process. This batch process took around 120 days to reduce lead plates to the white powder. New methods such as the Rowley and Carter processes cut the production time to as short as 12 days. The Matheson process further cut production time by using chemical precipitation.[55] New technologies extended to other color pigments as well. Factories and laboratories expanded the color repertoire

using chemically produced pigments: chrome and cadmium yellows, Prussian blue, and refined red leads, among others.[56] Together with packaging, factory production and new pigments made paint available in greater quantity, in more choices, and at less cost to consumers.

While paint production became more complicated the increase in paint choices and ease of application made painting an option for many Americans. In 1897 Sears and Roebuck offered dry colors, pigment pastes, prepared paints, floor paint, barn paint, buggy paint, enamel paints, varnishes, and an assorted variety of oils, brushes, and putties, all of which could be mail ordered. Paint companies attempted to reach a large pool of consumers by offering several color schemes and lines at once.[57] In 1893, the H. W. Johns Company tried to cover the entire market by providing colors and dark stains for Queen Anne and shingle style houses; blues, grays, and yellows for revival style homes; and white and ivories, trendy shades for trim.[58]

Interior decorators, women's magazine writers, and advice authors touted the virtue of paint over wallpaper and other wall coverings. Paint was inexpensive and supposedly more sanitary. In 1850, A.J. Downing recommended wallpaper as "so easy, economical and agreeable a means of decorating or finishing the walls of an apartment, that we strongly recommend them for use…."[59] The opposite was true by the turn of the century. The availability of paint made it cheaper than even mass-produced wallpaper. In addition, advisors, paint companies, and even physicians suggested paint was neater, as paint allowed homemakers and servants to wash and sanitize surfaces.

Consumers reaped more than just decoration and supposed improved sanitation from paint. As engineers George Hool and Nathan Johnson pointed out in *The Handbook of Building Construction,* paint served "structural functions." Paint reflected light in factories and warehouses and rendered previously "unsuitable materials," like ugly woods, as acceptable.[60] For most consumers the primary function of the coating was protection. All iron and steel related industries needed paint or associated protective coatings to prevent rust. Paint also protected wood from water and weather. Paint coatings benefited a wide variety of consumers who may not have even been interested in aesthetics at all. If there was one color associated with the working aspects of America, the color was red. Red paint covered boxcars, barns, and bridges—not because it was fashionable but because of the economy of red lead and the durability and abundance of red iron oxide.[61]

Reactions and Responses of Manufacturers, Workers, Consumers, Progressives and the Federal Government

In response to all the consequences of the increased manufacture of paint, both positive and negative, a whole new set of relationships developed among consumers, manufacturers, workers, and the federal government. Consumers demanded quality and accountability. Manufacturers formed trade groups and cartels, assured consumers about the reliability of paint, stressed the importance of buying brands, and changed their marketing tactics. Workers unionized and new fields emerged in public health and occupational safety.

Household consumers, distanced more and more from producers and afraid of being cheated, wanted assurance that they were purchasing "pure paint." Reputable companies advertised their products as "pure" implying they were free of diluents and additives. Ironically, the performance of new formulas supported the merit of adding such materials and many companies engaged in the practice. One chemist criticized both the public and suppliers, "the prejudice on the part of the general public and the trepidation of the manufacturer are to blame for the unheralded knowledge of the constituents of mixed paints."[62]

Many large consumers, including railroads and the military, understood the value of additives in paint. Like many producers of finished products, their primary concern was the lack of uniformity among their suppliers' goods. Without some sort of standards or even ingredient disclosure, product end users could not be sure a material met their specific needs.[63] How could they be sure of the consistency of quality between a single manufacturer's batches? How could they tell if different manufacturer's products were equivalent? How could company researchers be sure that their suppliers would deliver materials with the specified technical properties needed for adequate performance? Manufacturers, incensed at what they perceived as meddling and afraid of large buyers defaulting on material that did not meet their specifications, feared disclosure and the adoption of industry standards.[64] Major purchasers persevered.

Charles Dudley, an engineer working for the Pennsylvania Railroad, assisted in the founding of the International Association for Testing Materials (IATM) in 1898. Dudley hoped to create a consensus between both producers and suppliers. He believed that good specifications would result from the knowledge of a product's manufacturer and the product's user, who saw its performance. In 1902, the American organization separated from IATM and concentrated on writing standard specifications of materials derived from committee consensus. The American Society for Testing Materials released the member-approved specifications for paint, "Paint and Related coatings, Materials, and Applications," in 1902.[65] In 1901, the federal government established the National Bureau of Standards. Only in 1916 did the Paint Manufacturers Association adopt industry-wide standard definitions and nomenclature.[66]

In 1888, a group of paint and varnish manufacturers met in New York to establish an organization to promote the rapidly growing industry as well as further the overall well being of its members. The attendees called themselves the National Paint, Oil and Varnish Association of America. Later separate sub-organizations formed, including the Paint Grinder's Association of America, which eventually changed its name to the Paint Manufacturers Association of America. In addition to a national organization, many regions had paint clubs: New England, St. Louis, Chicago, Pittsburg, Philadelphia and Cincinnati.[67]

In 1891, several lead manufacturers formed a very different organization, the National Lead Company. The 25 lead and smelter operators who formed the National Lead Company managed their combined resources and successfully eliminated competition from non-National Lead members. The company became one of the largest lead producers, selling predominately to paint manufacturers, and later was a powerful lobbying entity.[68]

With no personal relationship between paint consumers and manufacturers, as had been the case with master painters and their clients, companies attempted to reach out to consumers through advertising and other methods. In addition to books of chromolithographic plates of house color combinations, paint sample cards, and media advertising, paint companies offered guarantees in hopes of enticing skeptical customers. Sears and Roebuck not only offered a guarantee on their Pink Label brand but offered a 5% cash discount to any customer willing to attach a small metal sign on their new paint job to advertise their product, a local form of endorsement.[69] Sherwin-Williams went one-step further with their guarantee pledging to refund not only the cost of the paint but also the cost of application.[70]

Another way companies both eased the apprehension of consumers while creating a demand for their products was through the promotion of brands. A brand name provided assurance of quality to a consumer. The authors of how-to books of the period upheld this belief by recommending the use of reputable brand names versus cheaper products.[71] Masury advised consumers that the only way to be sure of quality was "to purchase such colors *only* as bear the name of some well-known and responsible manufacturer."[72] By encouraging consumers to ask for their product by name, manufacturers kept middlemen and storekeepers from substituting competitor's paints.[73]

Probably the most disturbing trend of paint manufacturers was their long-standing effort to market lead paint to families and even children. Fearful of losing a generation of consumers, and hoping to retain sales by portraying lead paint as safe enough for children and thus everyone, National Lead targeted children. Manufacturers knew of the dangers of lead and some of the public must have known as well; however, the first reputable medical studies documenting lead poisoning in American children did not appear until 1914. Some members of the medical community raised concerns long before then, but powerful National Lead ignored detractors and perpetuated the idea that lead paint was a sanitary alternative to the wallpaper and wall coverings of Victorian America. In 1920, National Lead encouraged distributors of Dutch Boy Paint to pass out complimentary paint books to children reminding the dealers that the children may someday be their customers. The lead industry sponsored research-discounting fears, advertised the supposed virtues and safety of lead, and discounted health care workers who attempted to educate the public or advocate for restriction of lead in paint well into the 1950s.[74]

Both the federal and state governments became increasingly involved in public health and occupational health and safety beginning in the late nineteenth century and escalating with the Progressives' influence in the early twentieth century. This new interaction between government and business regarding safety primarily involved two federal organizations: the Public Health Service (PHS) and the Bureau of Labor Statistics (BLS).[75] Federal employees, union representatives and Progressive reformers increasingly challenged the notion that "the business of America was business" and called on the federal government to protect workers. One advocate for the safety and welfare of employees argued, "in this age of speed and rush and efficiency and mechanics, the thing we are most interested in is not mechanics or machinery, but men."[76]

The PHS evolved from an early federal effort; the federal government established the Marine Hospital Service to care for sick and injured merchant seamen in 1798. The service's responsibilities grew in 1891 to include the quarantine of ships' passengers, including the large masses of immigrants, and resulted in a name change to the Public Health and Marine Hospital Service. The increasing influence of Progressive health care professionals and the changing views of elected officials led to a broadening of the service's mission and a shortening of the name to the Public Health Service in 1912. Geared towards the public and thus consumers, the PHS began to regulate food and pharmaceuticals.[77]

In 1903 the Bureau of Labor Statistics produced the first federal report on industrial hygiene. Charles P. Neill, Commissioner of the United States Bureau of Labor, encouraged the bureau to investigate and report on more safety issues. Neill hired Dr. Alice Hamilton, the famous Progressive physician who lived at Hull House, as "special investigator for industrial diseases." Her first report was "White-Lead Industry in the United States, with an Appendix on the Lead Oxide Industry."[78]

Dr. Alice Hamilton worked for both the state of Illinois and the federal government investigating diseases and hazards of the work place. Among her pioneering work in occupational safety, she first studied the effects of lead on workers in 1910 while a member of the Illinois Occupational Disease Commission. Hamilton learned about the white-lead production processes and the methods of manufacturing paint. She visited hospitalized lead poisoned patients, examined medical records, interviewed victims of lead poisoning, visited workers in their homes and traveled to Europe so that she could compare the conditions of lead related work in America, England, and Germany.[79]

Hamilton found conditions in Europe far safer than in the United States. In an English factory, "under intelligent control," employing ninety men in the production of white and red lead, not one employee had been struck by lead poisoning in five years. In contrast, in the United States in a similar size operation employing eighty-five men "working under conditions of neglect and ignorance," thirty-five men were "leaded" in six months. What was so different in the United States? Hamilton discovered that American doctors often failed to diagnose lead poisoning because they did not recognize all the symptoms. In America industrial medicine and occupational safety was not seen as a legitimate branch of medicine but "a subject tainted with Socialism or with feminine sentimentality for the poor." Few articles on industrial hygiene and safety had been published in the United States, making the acquisition of good practices difficult for genuinely concerned employers. Finally, many factory owners and managers conveniently believed employees suffered from lead poisoning as a result of failing to scrub their nails or eating without washing their hands instead of by inhaling lead dust and fumes.[80]

To Hamilton it seemed manufacturers considered wage earners expendable and that managers and owners blamed the laborers themselves for their ailments, both prevalent sentiments among wage payers in many of the large industrial cities. In most cases, the workers were foreign, married, and fathers. "It sometimes seemed to me that industry was exploiting the best in these men—their love of their children their sense of family responsibility," she wrote.[81]

To combat poor working conditions, decrease exploitation by employers, and protect their trade, painters joined unions. Unions also provided camaraderie and fellowship. The membership of painters in unions mimicked those of the national trend, especially those of skilled trades; they shifted from cooperative craft societies to the inclusive Knights of Labor and then to the collection of skilled trade unions of the American Federation of Labor. The turbulence of the painter's unions' history illustrates the internal complexity of workers' efforts to collectively organize.

John T. Elliot, a prominent union organizer, provided a rich history to painter's unions in the United States. Elliott got his start with unions when he first joined the Longshore Painter's Union in New York after finishing his apprenticeship. He then helped found the Painter's Grand Lodge in 1871 and joined the International Workingman's Association. In 1879 he returned to his hometown of Baltimore and founded the Painters' Local Assembly of the Knights of Labor. Angered at the Knights of Labor for chartering a competing local, and disappointed in the decline of the painting trade, which he saw as "sinking to a level lower than that of unskilled labor," Elliott sought to form an alternative. In 1887 Elliott founded the Brotherhood of Painters and Decorators of America (BPDA)—a precursor to today's International Union of Painters and Allied Trades—and within one year membership grew to 111 locals and 7,000 individuals.[82]

The BPDA competed with the Knights of Labor for control of the painting trade in the United States. This rivalry lead to fractures within the BPDA between the east and the west, the west being anything west of the Atlantic coast, as the Western locals felt the BPDA was not doing enough to support their efforts.[83] The strife culminated in 1894 when two separate Brotherhoods of Painters and Decorators of America showed up at an American Federation of Labor (AFL) convention.[84] Despite the efforts of the AFL, the break continued until 1900. After unification membership dramatically increased from 13,443 members to 60,000 in 1904.

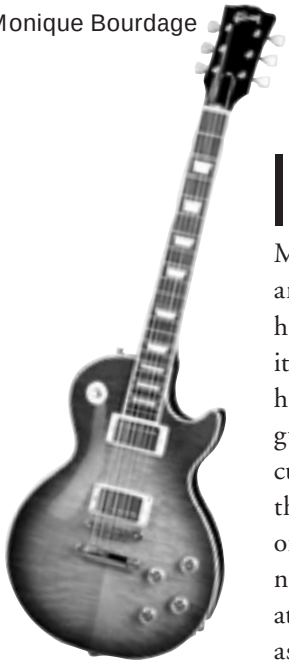
A Mixed Blessing

Increased paint manufacturing provided jobs, enhanced other industries' performances, created wealthy corporations, and gave consumers more choices. In addition, the rise of the paint industry poisoned workers, created a public health problem, and deflated an ancient art. The positives and negatives associated with the rise of the paint industry set off typical period responses: workers formed unions, the state and federal government began to intervene on behalf of laborers and consumers, and Americans bought more of the product.

In 1868 John Masury wrote, "the consumption of paint affords the best standard whereby to measure the progress of people in the best civilization."[85] Masury equated paint use with progress but a closer examination reveals that there were both costs and benefits to the growth of paint manufacturing and use—ready-mixed paint was ultimately a mixed blessing.

FROM TINKERERS TO GODS:
The Electric Guitar and the Social Construction of Gender

Monique Bourdage



In the United States during the early twentieth century, men dominated as innovators and players of the guitar. Men continue to dominate these fields because the design and use of the guitar and in particular, the electric guitar, have been historically constructed to exclude women. While its physical design contributes to the fact that few women have ever been honored for their ability to play the electric guitar, the relationship between the electric guitar and the cultural values it embodies provides a deeper explanation for the virtual absence of famous female players. The history of the electric guitar illustrates that a technology can neither be separated from the cultural values prevalent at the time of its creation nor those cultural values later ascribed to the technology.

Like other technologies, the history of the development of the electric guitar is long and complex. The modern electric guitar is not the result of a single inventor or design innovation. While amateurs and professionals alike sought to solve problems concerning the amplification and electrification of the guitar, this paper focuses on the contributions of a select group of innovators and manufacturing companies that made improvements that led to the creation of commercially viable and successful electric guitars. Because the guitar existed for hundreds of years before it was electrified, a brief history of the instrument's

Above: Gibson Les Paul guitar

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design and its introduction to America is necessary in order to fully understand the impact of its electrification.

The earliest surviving ancestors of the guitar date from the fourteenth century. By the end of the fifteenth century, the guitar appeared as an instrument distinct from its ancestors, such as the lute. Beginning in the mid-eighteenth century, luthiers slowly made innovations to the instrument that resulted in its now-familiar shape.[1] Explorers and missionaries introduced the guitar to the Americas; West Africans, brought as slaves to America, were also familiar with the guitar. In the early nineteenth century, guitars accompanied Spanish and Mexican cowboys when they accepted jobs tending herds on Hawaiian cattle ranches.[2]

Until about 1890, only traditionally trained luthiers and other skilled woodworkers, such as Antonio de Torres (1817-1892) and Christian Frederick Martin (1796-1873) were responsible for major design innovations to the guitar. The drive to electrify the guitar, however, attracted innovators from a variety of backgrounds. Although instrument makers from non-traditional backgrounds would not greatly impact the guitar market until 1931, inventors working between 1890 and 1928 foreshadow the transition of power in the industry from luthiers to tinkerers. The earliest patent concerning the application of electricity to the guitar was issued in 1890 to George Breed, a U.S. naval officer.[3] Although his innovations used electricity and magnetism to produce—but not amplify—sound, Breed's design ultimately proved impractical.[4] Lloyd Loar, on the other hand, aimed to maintain the traditional shape and method of playing the guitar. In 1919, the Gibson Corporation hired Loar and placed him in charge of product development.[5] By 1924, Loar had developed an electric viola and an electric bass. When the company refused to market his new instruments, Loar resigned and continued to work on his developments.[6] The Dopyera brothers, Slovakian immigrants and the sons of a violinmaker, had greater commercial success with their guitars, which used aluminum cone resonators to amplify the instrument's sound.[7]

From the 1930s through the 1950s, both amateurs and professionals attempted to design a practical and commercially viable electric guitar. In the beginning, practicality was the driving force behind the many guitar innovations. Jazz was the most popular musical genre from the 1920s through most of the 1940s, and as jazz bands grew into big bands, the guitar was unable to compete in terms of volume with the other instruments. Horn players often used megaphones to amplify their solos, which made hearing the guitar even more difficult.[8] This meant that bandleaders relegated the guitar's role to that of a rhythm instrument. As such, guitarists seldom received recognition for their skillful playing or took solos.[9] The Gibson L-5 guitar, designed by Lloyd Loar, offered greater volume than other guitars; the demand for guitars soon increased when many players decided to change from banjo to guitar. By 1929, manufacturers were producing more guitars than any other fretted instrument.

In 1931, Ro-Pat-In introduced the first commercially available electric guitar, a Hawaiian lap steel model. An equally important innovation came in 1951 when the Fender Musical Instruments Corporation released a model called the Broadcaster, which was the first solidbody electric Spanish guitar to enter mass production.[10] Due to a dispute over the name with the Gretsch Company, another instrument manufacturer,

Fender changed the model name to Telecaster.[11] Three years later, Fender introduced the Stratocaster model, which incorporated the suggestions of musicians—some of whom Fender Manufacturing employed as design consultants—with the innovations of Leo Fender and other company employees.[12] The Telecaster design had avoided the contours of traditional archtop guitars and its slab-like design made it uncomfortable to play for long periods.[13] The Stratocaster designers focused on creating a guitar that was comfortable to play and designed a thinner, harder guitar body with contours that made the instrument fit snugly against the player's body. Although the Stratocaster is now an icon of electric guitars, it was not an immediate success.[14]

As history illustrates, the electric guitar grew out of an industry steeped in tradition. Many of the key players in the early drive to electrify the guitar had apprenticed under luthiers or, as with the Dopyera brothers, were the sons of instrument makers. All of the innovators and company executives were men. New companies, such as Ro-Pat-In and Fender, led the market in electric guitar innovations and helped mark the transition of power in the industry from traditional instrument makers to tinkerers. This transition did not diminish the continued male dominance in designing, manufacturing, and playing the electric guitar.

Established instrument manufacturers were initially hesitant to enter the electric guitar market for reasons based on tradition and practicality. First of all, it is hard to fault established instrument makers for failing to see the potential of electrified instruments; at the time, many Americans did not have electricity in their homes. Secondly, the old technology used to produce acoustic instruments had brought success to established companies, some, like C.F. Martin, for over a hundred years. These companies were not willing to abandon proven technology to take a chance on a technology still in its experimental stages.[15] Instrument makers willing to experiment, such as the Dopyera brothers, and tinkerers, like George Beauchamp, were thus free to enter the market with relatively little competition. This, in turn, paved the way for tinkerers like Les Paul and Leo Fender to make names for themselves through their involvement in the design and production of solidbody electric guitars.

The development of the electric guitar is closely related to the evolution of the radio and phonograph. Both radio and electric guitars exist in their current forms due in large part to the innovations of tinkerers during the early stages of their development. The widespread construction of radios and the electrification of the guitar both contributed to making music a masculine pastime. During the nineteenth and early twentieth centuries, cultural values held that music appreciation was a pastime relegated to women; in 1922, women still comprised the vast majority of music students and concert audiences. Radio, with its need to be constructed and tinkered with, legitimized music appreciation for men.[16] Moreover, through radio construction and tinkering, many boys and men gained a working knowledge about electronics, which aided in the development of the electric guitar.[17]

Many of the fathers of the electric guitar began with experiments relating to radios and phonographs. The Dopyera brothers utilized a Victrola horn in their first attempt to amplify a guitar for George Beauchamp. During his own experiments, Beauchamp modified a phonograph pickup and attached it and a single string to a

wood block.[18] Les Paul conducted audio experiments throughout his life and, at the age of twelve, built a crystal set without using a kit. From then on, he sought to learn as much as he could about electronics by reading books and hanging around radio stations and radio supply shops.[19] His first attempt at amplifying his guitar involved using his father's phonograph. Leo Fender also began his career as a radio enthusiast. Prior to establishing his radio repair shop, Fender made a business of building and renting out amplifiers and public address systems. He also repaired phonographs and amplifiers, and sold records at the shop he opened in 1938.[20] Additionally, Roy Van Nest, who ran a radio shop in Los Angeles, designed and built the first amplifier model produced by Electro String.[21]

Many other amateur tinkerers conducted similar experiments in order to amplify their guitars. Even after electric guitars became commercially available, musicians sometimes chose to modify their own instruments. First of all, the electric instruments were not widely available, especially in rural areas.[22] Secondly, the electric guitar emerged during the Great Depression, a time when most musicians could not afford to spend $150 on a new instrument. Many musicians recognized that they already possessed the components necessary for amplification through other electronic household devices: radios contained loudspeakers and amplifiers; phonographs contained pickups and loudspeakers; telephones and microphones utilized transducers. Some musicians fashioned their own pickups out of the coils and magnets contained in telephone receivers.[23] A 1936 article that provided instructions for building a pickup stated that most radio receivers could be sufficiently used as amplifiers.[24] Even famous musicians like Eddie Durham, the legendary jazz guitarist who influenced Charlie Christian, experimented with ways of amplifying their guitars. Durham carved out the top of his acoustic guitar and inserted a tin pie plate, which resonated with sound when he played. To further increase his instrument's volume, Durham played through a megaphone. Soon he purchased a National resonator guitar and replaced its bridge with one from a standard acoustic guitar. This enabled him to play the instrument without the steel bar, and when he placed a microphone near the resonator, his instrument could be heard as well as the rest of the band.[25]

But the electric guitar owed its design innovations to more technologies than the radio and phonograph. During the 1950s and 1960s, electric guitar manufacturers connected their instruments to the nation's burgeoning car culture and obsession with the space race. The name of the Fender Telecaster made reference to television; the Fender Stratocaster linked the instrument to space travel.[26] The reference to technologies of flight is hardly surprising given Fender Manufacturing's management at the time. In 1954, Fender hired Forrest White, who had been an engineer at Goodyear Aircraft.[27] The advent of the solidbody enabled manufacturers to significantly alter the body shape of guitars, and many designs of the period, with their cutaways and horns, echoed the fins popular on automobiles at the time.[28] In addition to shapes, electric guitar manufacturers also appropriated automobiles' paint jobs by choosing metallic finishes in an attempt to differentiate their instruments from those of other manufacturers.[29] Gibson made the connection between electric guitars and automobiles explicit when it hired Ray Dietrich, an automobile designer, to collaborate on a new model, which it

introduced in 1963 under the name Firebird.[30] Guitar manufacturers large and small released models with names either borrowed from or more suited to the automobile and aircraft industries: Guild Thunderbird; Fender Jaguar; and Gretsch Duo Jet, Jet Firebird, and Corvette.[31] These model names capitalized on the popularity of hot rods, muscle cars, and sports cars among teenagers, who were attempting to distance themselves from their parents' values and build their own identities. At a time when teenage boys regularly made extensive alterations to the bodies and engines of standard automobiles, guitar manufacturers responded by modernizing the bodies of their products.[32]

While amateur tinkerers and other technologies aided in the propagation among consumers of the idea that electric guitars belong in the masculine realm, decades earlier consumers had already ascribed values to electricity that reinforced the masculinization of the instrument. Before people understood how electricity and electric devices operated, consumers—even some scientists—had a tendency to ascribe supernatural or divine origins to the functioning of electric devices. In 1745, Pieter van Musschenbroek created the Leyden jar, which allowed for the accumulation of electricity in a jar and enabled the mysterious substance to be studied in a controlled environment. By 1844, when Samuel B. Morse successfully demonstrated the use of his electromagnetic telegraph, electricity was still closely connected to the life force in the minds of many scientists and the public. By the end of the 1840s, Modern Spiritualism had taken shape as a religious and political movement based on the idea that it was possible to create a telegraph line to the spirit world.[33] Two sisters, Kate and Margaret Fox, invented the movement when they claimed to be able to interpret and communicate with a spirit in their house through a series of rappings. Victorian culture soon deemed that women had a special capacity for spiritual communication, and mediumship became a respectable mode of expression for women.[34] From the late 1910s through the mid-1920s, many Americans indulged their fascination with spiritualism. At that time, Sir Oliver Lodge, a famous physicist, gave numerous public lectures on the connection between the radio and spiritualism. Consumers often found it difficult to reconcile radio's ability to wirelessly transmit the human voice without turning to magic or miracles as an explanation. Lodge's insistence that radio could provide contact with the spirit world only reinforced the idea that the technology possessed supernatural characteristics. Through writings, lectures, and advertisements, the idea that electrification signified a miracle spread throughout the nation.[35]

Although Lodge's popularity had dwindled by the mid-1920s, manufacturers continued to emphasize the divine attributes of their products in advertisements. Electro String's advertising brochures exemplify this tendency. The front of the company's 1931 brochure beckoned consumers with the statement, "Brother musician listen to a MIRACLE!" This statement not only linked the company's instruments to the divine, but also functioned to exclude women through its invitation to male musicians only. In the same brochure, Electro String also used the words "miracle" and "magic" and described the Spanish guitar as ethereal. The company claimed their instruments had been "touched with the magic wand of electrical genius," which provided Electro String's instruments with volume, that all-important quality other instruments

lacked.[36] By 1936, the company had added the following tagline to their advertising brochures: "Rickenbacker Electro Instruments linked to the magic of Electro Amplification."[37]

Although consumers no longer identify electrification as a miracle, these early ideas continue to pervade discussion of the electric guitar and its players. Early advertisements for guitars and the identification of exceptional players as guitar gods demonstrate the idea of the divine origin of electrification. Because the vast majority of Americans worship a male deity, a tendency exists to equate the divine with the masculine. John Durham Peters pointed out in *Speaking into the Air: A History of the Idea of Communication* that although women have dominated the history of spiritual communication via mediums—even utilizing a guitar sometimes to do so—this domination has not carried over into communication via modern media.[38] When success as a guitarist emphasizes the attainment of god-like status, critics and fans alike erect another barrier to women's entrance into (not to mention equality within) the realm of the electric guitar.

Some musicians in the 1930s made a literal connection between the electric guitar and the divine, which resulted in a musical genre known as sacred steel. In the late 1930s, brothers Willie and Troman Eason introduced the electric steel guitar to services at the House of God, Keith Dominion Church of which they were members. The House of God is an African-American Pentecostal church in which music has historically played an integral part in the services. Members of all three dominions (Keith, Jewell, and Lewis) of the House of God church believe scripture that references praising God with dance and stringed instruments calls out for their style of worship. Troman Eason had taken steel guitar lessons from a Hawaiian in Philadelphia and played the instrument in the traditional Hawaiian style; his brother, Willie created his own playing style, which emphasized playing a single string phrase which echoed the singing of the congregation. The sacred steel tradition of the church grew out of Willie Eason's style of playing, and, to this day, the steel guitarist remains almost as important to the worship service as the minister.[39] Due to the sacred nature of the music, the sacred steel tradition prospered within the church for decades with little public knowledge of its existence. In the 1990s, however, Keith Dominion musicians recognized that their music could be used as a powerful evangelical tool and began playing to the public. The church actively encourages boys from the congregation to learn to play the electric steel guitar.[40] The church's targeting of boys to carry on the electric steel tradition mirrors secular America's tendency to identify playing the electric guitar as a masculine pastime.

The existence of music stars and rock gods has greatly contributed to the gender gap in electric guitar performance. Stars and gods widen the gap in two significant ways: 1) the exclusion of women through the emphasis on identification with a male deity; and, 2) promoting the idea that men are primarily producers and women are primarily consumers of technologies. Although these are connected, this paper will first examine the elevation of some electric guitarists to the status of gods.

One of the most important figures in the electric guitar's history is jazz guitarist Charlie Christian, whom many historians and fans consider to be the instrument's first star.[41] Many musicians thought the instrument to be a novelty in its early days. In 1939 Christian wrote an article for a Chicago newspaper that called on other guitarists to electrify their instruments. Christian charged that most bandleaders did not know how to use their guitarists effectively relegating them to rhythm parts, which gave guitarists little chance to demonstrate their musical artistry. Guitarists unwilling to trade creativity for a job keeping rhythm in a band often found themselves unable to earn a decent living as musicians. Through his membership in Benny Goodman's band and subsequent rise to stardom, Christian proved that "electrical amplification has given guitarists a new lease on life." In his article, Christian correctly predicted that electrical amplification would enable guitarists to demonstrate their talent and preferred styles of playing to the world. Years before rock 'n' roll emerged with its emphasis on the sound of the electric guitar, Christian assured fellow guitarists that "you continue to play guitar the way it should be played. And you'll make the rest of the world like it."[42]

On another front, rock 'n' roll grew out of the blues tradition, particularly the urbanized and electrified Chicago blues sound popularized by musicians such as Howlin' Wolf and Muddy Waters in the 1940s. These guitarists and others created a sound that balanced the traditional Delta blues, which they had grown up playing, with the electrified sound that urban audiences had begun to prefer. In *Electric Guitar: History of an American Icon*, André Millard characterized the image of the bluesman as an updated version of the romantic hero in European culture. This emphasis on a single figure, along with the prevalence of guitar solos in the blues, foreshadowed the emergence of rock gods in the 1960s.[43] Most white American audiences, however, did not become aware of the influence of Chicago bluesmen on rock 'n' roll until British musicians, such as the Rolling Stones, covered songs by American bluesmen and, thereby, introduced many white Americans to a piece of their own musical heritage.[44]

Historians generally credit Chuck Berry as a pioneering figure in rock 'n' roll. Berry grew up in St. Louis, an urban area where electric instruments were easily obtained. Although Berry has listed jazz and blues guitarists Charlie Christian, T-Bone Walker, and Muddy Waters among his influences, his music combined elements of African American and white pop music with those of the blues.[45] Waters not only influenced Berry's sound; in 1955 he directed Berry to Chess Records where he subsequently recorded his first Top 10 hit, "Maybelline."[46] Although the music that followed by artists such as Elvis Presley, Buddy Holly, and Jerry Lee Lewis, represented a revolution in popular culture at the time of its issue, their early releases appear staid compared to the rock 'n' roll sound that musicians developed in the late 1960s.

Stylistic developments often defy original goals. While guitar manufacturers had spent years perfecting designs that yielded sound free of feedback, in the late 1960s rock 'n' roll musicians exploited all of the sonic capabilities of their equipment. The use of wah-wah pedals, feedback, distortion, and various other electronic effects became commonplace, and musicians took volume to a new level by using columns

of amplifiers.[47] Audiences came to look upon those musicians who could master what Steve Waksman termed "the potential sonic chaos of the electric guitar" as not only heroes but guitar gods.[48] Because of rock 'n' roll's blues roots, the tendency of fans and critics to associate expert playing with the supernatural is not surprising. Blues songs abound with tales of musicians selling their souls to Satan for mastery over their instruments. With this sort of folkloric past, rock guitarists who exhibited self-mastery over their instruments must be gods.

In order to earn the title of god, however, a guitarist needed to display an impressive image along with substantial skill. The cover of the album *Axis: Bold as Love*, by the Jimi Hendrix Experience, for example, depicted Hendrix as a Hindu god.[49] But perhaps no other album of the early 1970s better exemplified the supernatural status of the rock star than David Bowie's 1972 release, *The Rise and Fall of Ziggy Stardust and the Spiders from Mars*. Several of its tracks tell the story of Ziggy Stardust, a guitar god who let his fame go to his head. While the names of the mythical hero and his band clearly painted rock stars as not of this world, the opening and closing lines of "Ziggy Stardust" emphasized the more important fact that differentiated this mythical hero from mere humans: "Ziggy played guitar." The back cover of the album boldly instructs listeners that the album is "to be played at maximum volume."[50]

Although the women's movement began shortly after the guitar god emerged as a popular culture figure, few female electric guitarists have achieved as much fame as their male counterparts, and the image of the guitar goddess still seems strange to the majority of audiences and critics. Ancient Greek and Roman mythology established that a god invented music: Mercury (Hermes) invented the first lyre by stretching strings over a tortoise shell. Yet another reason for the lack of the goddess figure in rock 'n' roll may be the predominance of male-centered religion in the United States. In *When God Was a Woman*, Merlin Stone argued that the story of Genesis and the fall of Eve are largely responsible for perpetuating the idea that women are not equal to men. Parents and churches teach children that the Creator is male and that He created man in His own image; the creation of woman came as an afterthought and for the purpose of providing man companionship. After Eve sinned by eating the apple and God expelled Adam and Eve from the Garden of Eden, God granted Adam dominance over Eve and effectively granted all men dominance over women. Although the women's movement made some strides toward gender equality, Judeo-Christian cultures still hold onto the idea that man is a doer and woman is his helper.[51]

In terms of rock 'n' roll, these traditional gender roles dictate that woman's place remain that of fan or groupie. If a woman breaks these barriers and joins a rock band, gender roles have tended to relegate her to a supporting position, such as singer or bass player. Although singers receive much of the spotlight, most do not achieve the same level of adulation reserved for electric guitarists: fans and critics do not spend hours in debate over vocalists in the manner in which they argue over guitar gods. Those female musicians who play electric guitar face many obstacles to gaining recognition for their talent. Only one of these obstacles is the fact that her gender, according to dominant social and moral values, places her at a disadvantage in the quest for god-like status.

Still another barrier to women even picking up an electric guitar is the masculinization of powerful and prestigious technologies. Ruth Oldenziel argued that the masculinization of technology is largely a product reflective of racial, gender, and international relations in the twentieth century. Beginning in the 1890s, society increasingly considered machines as the most important inventions. The steel and other machine-related industries employed few women, which served to distance women from important technologies. Most patent owners were white males, and many Americans at the time accepted that women and other races naturally lacked inventive genius, which helped place technology in direct relation to white, middle-class notions of manliness. These notions of manliness, which upheld athletes and working-class men as standards, devalued women and non-white males. By the end of the 1930s, the public had inextricably linked prestigious technology and engineering —an occupation dominated by white men—to middle-class males. Oddly, the idea of powerful or prestigious technology as a male preserve firmly took hold in the public mind at the time when women entered the workforce in larger numbers than ever before. The increase in women's mastering of machines in jobs as secretaries, factory workers, and switchboard operators, threatened male power. The acceptable feminine pursuit of technology involved the devalued technologies associated with homemaking. Despite evidence to the contrary, men's best defense involved attempting to erase women from the history of technology by emphasizing man's "natural" aptitude for all things technological. That attitude has succeeded in devaluing women's contributions to technological fields; enabled men to look upon any woman entering a technological field—regardless of training and ability—as an amateur; and, it barred many women from access to technological pursuits.[52]

Such masculinization of technology is also related to the dichotomy of the male producer/female consumer. Thorstein B. Veblen, an institutional economist of the late nineteenth and early twentieth centuries, wrote that women of the leisure class played a primarily decorative role. Female idleness enhanced their male partner's status by conspicuously demonstrating that these middle class men provided so well their wives did not have to contribute financially to the relationship. Such statements reinforce that economic contributions, measured through one's production of goods, are the only important household contributions. Traditionally female activities, such as child rearing and homemaking, by this definition, are duties rather than contributions to the family. In other words, men are superior because they produce so that women may consume.[53]

The male producer/female consumer dichotomy, although in existence since the mid-nineteenth century, became explicit in American culture during the prosperous post-World War II years. Manufacturers exploited familial responsibilities in their advertisements, and, in the process, reinforced the roles of producer and consumer as gender specific. In 1945, advertisers began promoting the image of the balanced homemaker: a wife and mother able to care for her family without sacrificing her personal interests.[54] Advertisers helped establish the male identity as producer in the postwar consumer culture by appealing separately to men's and women's familial

responsibilities.[55] The images of husbands and fathers reflected to society through advertising, depicted the male role as that of the producer who generously allowed his wife to partake in consumer culture for the benefit of the entire family.[56] The male producer/female consumer dichotomy continues to exist in much of American culture, including rock 'n' roll, a genre steeped in the sound of the electric guitar. An important step in masculinizing the guitar came with the instrument's electrification; with electricity in male hands and the increased linking of other technologies to masculinity, the electric guitar became a male preserve.[57]

Early consumers ascribed sexual meaning to electricity when they referred to flirting as "sparking."[58] The advent of rock 'n' roll reinforced the technological gender gap and expanded the sexual meaning associated with the harnessing of electricity. In the 1950s, manufacturers targeted teenagers as a distinct marketing demographic and drew on many of the same principles to appeal to girls and boys as they used to appeal to these teenagers' mothers and fathers. Although as audience members, boys and girls alike fill the role of consumer, cultural values and marketing ensure that, in general, the genders consume in different ways. While boys identify with rock musicians in sexual terms, they also attempt to align themselves with performers through record collecting, learning to play an instrument, or aspirations to work in the music industry.[59] Although Gibson and Electro String recognized early on the potential of celebrity endorsement, manufacturers did not fully realize the extent to which consumer identification with an electric guitar star could boost instrument sales.[60] Dean Zelinsky, founder of Dean Guitars, however, summed up male fans' sexual identification with rock stars when he stated, "'You played the guitar so you could get laid. We found out that a hot chick sold more guitars than a hot rock star.'"[61]

On the other hand, in order to capitalize on the popularity of Elvis, manufacturers printed his image on products ranging from pillows to socks and released lipstick in shades like Heartbreak Hotel Pink.[62] This demonstrates the difference between the way the music industry markets to boys and girls. In such ways, girls learn to identify with rock performers in ways opposite of boys. Through lyrics and merchandising, girls learn to fantasize about becoming the rock star's object of affection rather than his equal. Males consume actively by attempting to become the rock star, and females consume passively by dreaming about providing companionship to the rock star.[63] Some historians and critics have argued that rock 'n' roll allows teenagers to rebel against values such as domesticity and monogamy, which tend to be culturally viewed as feminine values.[64] Upon closer inspection, however, mainstream rock songs, especially those targeting female fans, often reinforce traditional notions of romantic relationships and gender roles.[65]

In addition, some bluesmen and early guitar gods, like Jimi Hendrix, imbued the electric guitar with connotations of hypersexuality. Many bluesmen referred to their electric guitars as "easy riders;" the term referred to the fact that the instrument could be easily carried on the musician's back, but it also referred to a female sexual partner.[66] The linking of sexual prowess to electric guitar virtuosity involves syntonicity, i.e., the identification of a technology as part of one's body.[67] In terms of rock 'n' roll performance, however, the electric guitar takes on the role of technophallus. Through

body positioning and flamboyant physical displays, players, like Hendrix, fortified male dominance over the electric guitar with a large dose of phallic symbolism.[68] Male electric guitarists often handle their instruments in ways that recall sexual acts or emphasize the phallic symbolism of their guitars. Photographs of Jimi Hendrix playing on his knees with his head thrown back and guitar held in front of his outthrust pelvis have captured—and perhaps perpetuated—this phenomenon.

Ergonomically speaking, the guitar is most easily and comfortably played when held somewhere between the player's chest and waist. Despite this fact, many rock guitarists play low-slung guitars held below the waist. Such positioning of the guitar makes it a more obvious phallic symbol. Through the influence of the sexually charged performances of guitar gods, many fans and players have come to regard low-slung guitars as the only positioning that looks right. Therefore, even on women, the instrument appears as an extension of the male body, reinforcing the idea that the electric guitar should be left to male hands. Music critics have even utilized the term "cock rock" to describe loud, sexually aggressive performance styles.[69] Other phallocentric terms, such as "wanking" and its variants, are used to describe electric guitar performance. The term wanking derives from British slang for masturbation, and fans and critics use it to describe a guitar technique that emphasizes speed and technical ability through rapidly playing many notes up and down the neck. While wanking denotes technical skill, most audiences find such displays tedious; such performances chiefly benefit the guitarist by allowing him to demonstrate his prowess. One final example: Prince stretched the metaphor of guitar as phallus to its limit when he had two identical guitars custom built for the *Purple Rain* film and tour. The film's closing shot captured the image of Prince playing the custom guitar until it ejaculated liquid soap.[70]

In addition to the phallic symbolism of the electric guitar, the instrument also connotes qualities such as speed, violence, power, and volume, through model names and styles and terminology that describe the instrument and playing techniques. Fans often use words like shred, slay, rip, burn, and wail to describe technical prowess on the electric guitar, especially in reference to guitar solos. Some people also use the term "axe" in place of guitar. By 1969, manufacturers had released electric guitars with names like Spitfire and Marauder.[71] With the rise in popularity of heavy metal in the 1970s and 1980s, many guitarists returned to angular body shapes that originated in the 1950s. While Gibson produced the Flying V, Moderne, and Explorer models as symbols of space-age modernity in the late 1950s, heavy metal guitarists had a tendency to wield them more like weapons. The SG, a model Gibson originally released in 1961, enjoyed a resurgence in popularity among heavy metal guitarists. The model's twin cutaways and short, pointed horns gave players unhindered access to the frets nearest the guitar's body.[72] In a genre that emphasized speed and precision in fretting, players found such access advantageous.[73] Soon other guitar manufacturers entered the market with updated finishes on sharp-angled guitars in order to capitalize on the new-found popularity of older Gibson models. Models available now include the ESP Viper, which looks like an updated version of the Gibson SG, and several models featuring deep curves or angles cut from the end of the body and upper and lower

bouts ending in sharp points. Those of the latter type carry names such as the ESP Ax; B.C. Rich Bronze Warlock, Platinum Pro Zombie, and Bich (pronounced so it rhymes with "Rich") Archtop; and the Jackson Warrior.[74] Although plenty of electric guitarists continue to play instruments with more traditional body shapes, the guitars mentioned above illustrate how some model names and body shapes have been used to appeal to men and teenage boys. Allowing women to wield such power in public simply grates against norms of acceptable feminine behavior.[75]

Still, cultural values have not always excluded women from playing the guitar. At least as early as the sixteenth century, paintings and illustrations depicted women playing guitars, and European cultural values held that guitar playing was a feminine pastime. The guitar continued to be a popular instrument among women throughout the nineteenth century, though women tended to play in the privacy of their own homes rather than give public performances.[76] As the guitar grew in size and weight during the early twentieth century, the number of female players declined.[77] The 1930s spawned a handful of female blues guitarists, but with the electrification of the instrument, the guitar fell into predominantly male hands.[78] Although the 1936 Electro String advertising brochure featured a female group called Sweethearts of the Air, audiences considered female guitarists a novelty.[79] Except for the occasional novelty act, the early days of rock 'n' roll featured no notable female electric guitarists. To this day, cultural values still largely hold that the only guitar acceptable for a woman is an acoustic one. Although women are playing the electric guitar in increasing numbers, the instrument's macho image remains.[80] The fact that critics and audiences continue to emphasize gender when talking about female guitarists illustrates that, to a large extent, women playing electric guitars continue to be a novelty in the music industry. Such treatment of female electric guitarists demonstrates the persistence of the idea that this technology is inherently masculine.[81]

Therefore, women who play the electric guitar challenge the patriarchal power structure of the music industry and larger society: A woman can invalidate claims that electric guitar technology and rock 'n' roll are exclusively masculine domains by taking the stage and playing the electric guitar.[82] Getting to the point of being able to take the stage, however, is not that simple. Public performance of the electric guitar requires not only drawing attention to oneself, but also doing it loudly. These traits have no place in a society that values women as passive consumers. When Patricia Kennealy-Morrison wrote about her fantasy of getting onstage and playing "forty-five minutes of the indisputedly finest rock guitar ever heard anywhere" and then retiring from music, her fantasy was not directed at her inability as a woman to exercise an electric guitar; rather, it was directed toward her inability as a woman to exert that kind of freedom and power.[83]

Judging from the virtual invisibility of female guitarists in mainstream popular culture, women still lack such freedom and power. A recent exhibit on the history of the electric guitar sponsored by the Smithsonian claimed, "thanks to pioneers like Bonnie Raitt, women have earned an equal place in what had traditionally been a male-dominated field."[84] Yet a companion program to that exhibit made reference to

eleven guitarists, only one of whom was female.[85] The claim of equality seems premature. Likewise, a quick glance at *Rolling Stone*'s list of "The 100 Greatest Guitarists of All Time" demonstrates the extent of inequality between the recognition given to male and female guitarists. Only two women appear on the list: Joni Mitchell, a predominantly acoustic guitarist, achieved 72nd place; Joan Jett, an electric guitarist, came in at 87th place.[86] Although *Rolling Stone* publicized the list almost three years ago, the March 2006 issue of *Guitar Player* pictured virtually no women within its pages. Excluding the classified ads at the back of the magazine, the advertisements in that issue featured three drawings and one hundred and fifteen photographs of men and but one drawing and five photographs of women. Only one of the advertisements showed a woman holding an instrument, but that ad was selling leather guitar straps and the woman's guitar was acoustic. Additionally, only two articles focused on female musicians, while approximately ten articles concerned male musicians.[87] Although one may consider it an advance that advertisers, at least in the publication examined, are not using images of women as groupies to appeal to male guitarists, the continued lack of female role models within the pages of guitar magazines is disheartening.

Most recent efforts to increase the number of female electric guitarists, however, tend to focus on the design of the instrument rather than its meaning in popular culture. Mavis Bayton argued that manufacturers have traditionally designed guitars for the male body and have not taken into account the fact that women have breasts.[88] Manufacturers, such as Fender and Gibson, have recently introduced models geared toward women with thinner, lighter-weight bodies and thinner necks than standard models.[89] In January 2006, Gibson announced the release of the SG Goddess and Les Paul Vixen, which were versions of the standard SG and Les Paul models, respectively, updated to appeal to women. The modifications included lighter bodies, thinner necks, and availability in colors such as coral.[90]

Recently, women have entered the guitar market with designs intended to encourage girls to play the electric guitar. Luna Guitars, founded by Yvonne de Villiers, is one such manufacturer. De Villiers, who worked as a stained-glass artist before starting Luna Guitars, claims her inspiration for the line of instruments came from years of watching her mother, an electric bass player, struggle with her heavy instrument. Although Luna Guitars claims that the company markets their instruments to males and females of all ages, their website emphasizes the feminine, particularly in the descriptions of instrument models featuring slender necks, smaller headstocks, lightweight bodies, and finishes inspired by stained glass.[91]

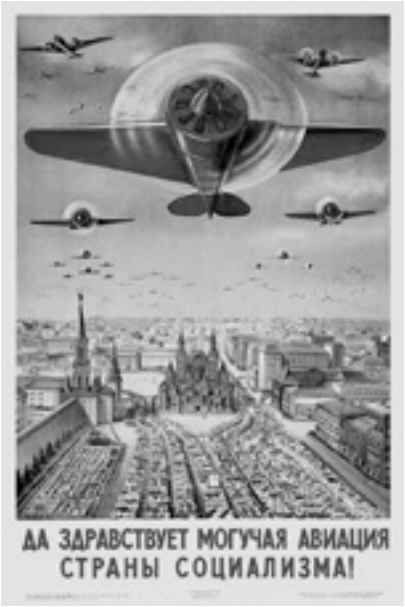
Daisy Rock, on the other hand, is a more prominent company that manufactures guitars for female players. Tish Ciravolo, an electric bass player and mother of two girls, founded the company in 2000 in a self-described attempt to "level the playing field" for female guitarists. In the company's mission statement, Ciravolo argued that standard guitar bodies do not fit the female form. She further argued that the awkwardness of playing a bulky instrument leads female musicians to believe that they should not play guitar at all. In addition to lightweight bodies and slim necks designed for smaller hands, Daisy Rock guitars feature bodies contoured to fit the female form.[92]

On the surface, Daisy Rock appears to be making progress by encouraging girls as young as six to play the electric guitar, yet many of the company's attempts seem misguided and short-sighted and serve to reinforce traditional gender roles. For example, the company produces bodies shaped like hearts, flowers, butterflies, and stars; a guitar with a more traditionally shaped body bears the model name Tom Boy. Additionally, Daisy Rock's guitars come in shades of pink, purple, blue, and yellow, and often feature a glittery finish. Such innovations seem to imply that the real barrier to preventing more females from becoming guitarists stems from the instrument's lack of frilliness. Even the new Gibson models mentioned earlier reflect the idea that the way to eliminate barriers between women and electric guitars is through a pastel paint job. While Daisy Rock's guitars may capitalize on the idea that girls do not have to give up their femininity to play electric guitars, focus on the instrument's design only distracts from the real issue. The company's designs reinforce traditional gender roles by defining femininity through a narrow range of shapes and colors and by labeling those female musicians who prefer traditional guitar designs as more masculine than the rest of Daisy Rock's customers. Ciravolo has also published two books on guitar method for girls and a book on bass method for girls.[93] Gender-specific instructional books perpetuate the idea that boys and girls differ fundamentally in their musical aptitude. The design argument for the absence of female electric guitarists falls apart when faced with the example of Prince, a small-framed male guitarist who has no trouble displaying his virtuosity on a Fender Telecaster. The argument misses the point that the solution lies in the cultural history of the technology rather than the technology itself.

No technology operates in a context free of cultural values. While guitar manufacturers have recently begun to market electric guitars to female musicians, the real barriers preventing female electric guitarists from gaining recognition as credible musicians are the same barriers women face when entering other professions. These barriers include the underlying assumption that women are inferior to men, the tendency to link powerful technologies to masculinity, and the subsequent tendency to treat women as amateurs in technological fields regardless of their training and talent. While one can far more easily alter the design of a guitar than alter prevailing cultural values, only the latter will have any lasting effect. Until then, the comparative absence of female electric guitarists serves as a self-fulfilling prophecy, as younger female musicians find themselves with few female role models. Although the number of female electric guitarists continues to grow, in 2004 female musicians counted for a mere seven percent of electric guitar sales.[94] While sparkly, pink guitars with bodies shaped like hearts might initially spark the interest of some girls in the electric guitar, the change is merely cosmetic, and, in many ways, reinforces traditional gender roles. Most likely, women's equality with men will have to come in other areas before it comes to the field of playing the electric guitar. Until then, female electric guitarists would do well to heed Charlie Christian's advice and continue to play their instruments the way they should be played until they make the rest of the world like it.

SOVIET FAITH IN TECHNOLOGY:
Soviet Ideology and its Practical Application in the 1920s–1930s

Nicholas Coombs



Introduction

The Soviets placed an enormous amount of faith in technology, which without the proper foundation, hindered industrialization. The Soviet administration in the 1920s and 1930s experimented with different methods of organization and technology. The twenties' visions were often more utopian and broad, while the Soviet Union in the thirties, under the leadership of Josef Stalin, tried variants of Taylorism. In both decades, the success of United States manufacturing influenced Soviet ideology to believe that technology could transform civilization. Although historian Richard Stites argues that Stalin strangled the revolutionary dreams of the 1920s with his monolithic vision of the future,[1] there is still more continuity between the two decades than there is disparity.

That is not to say that Stalin did not play a major role; but, with a hierarchy that contained educated and trained technological elites of industry carried over from the previous years under the New Economic Plan, it is impossible to ignore pre-existing elements. The worship of technology that existed in the Soviet Union continued throughout its entire existence. Where did this faith come from? More importantly, why did a technocratic system fail to attain its industrial goals? How could a system so devoted to technology so inadequately make use of its resources? This paper traces the Soviet Union's technocratic origins, and examines how,

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with so much emphasis on technology, the system failed to "leap forward" to the degree envisioned in the first years of Stalinist industrialization. Failure had much to do with the Soviet Union's inability to create a technological foundation ready to receive orders from on high. Technology often preceded specialists. However, this paper is not arguing that faith in technology alone was responsible for the failures of central planning, but argues that Soviet faith in technology was one factor that hindered early Soviet development.

Was the Soviet experience exceptional? No, for it is clear that Western countries experienced the same ideological praise for technologies as the Soviets did. In fact, the Soviets were merely following the lead of the Western powers. However, there are a few differences worth mentioning. As described above, the Soviets were able to implement their ideas unchecked in their authoritarian system, different from Western countries, which had fail-safes to prevent the implementation of radical ideas. This, however, was not the only difference. The Soviets lacked a technological system capable of sustaining top-down driven improvements in machinery. While the technocratic bureaucracy may have had a culture all their own in their devotion to machine technologies, it did not trickle down to the actual people who were going to use the new technologies provided.

In the West, technologies developed both from top-down and bottom-up relationships. In the Soviet Union, it was almost exclusively top-down. Soviet administrators often punished those at the bottom who tried to innovate because it slowed down production. The techno-bureaucrats in the administration looked for "ready-made" solutions alien to pre-revolutionary culture.[2] The development of technology is a cultural process, and although transfers of technology can and do take place, a reasonable foundation must be present to accommodate new methods. The Soviet Union was deficient in this base.

The Soviets lacked a number of key components to make their technocracy work. Machine technologies not only require the actual devices for success, they require trained workers to operate them, factories to produce replacement parts, and mechanics able to fix or upgrade them. Since many devices were of foreign origin, they lacked key cultural components to drive technological innovation. Unlike the West, the Soviets had few people tinkering with machines to improve on old designs. Machinery quickly became outdated, and the Soviets had to purchase new equipment at steep prices. Technology may have been a leading concern for the bureaucrats, but it was divorced from the Soviet people. Machine technologies had only been a small part of pre-revolutionary Russian society, and even then, Tsarist Russia depended heavily on foreign equipment and investment. Soviet culture emanated from the top-down, and with its authoritarian force, industrialization slowed down when alien technological ideas tried to speed up production.

Soviet Administration and the Birth of Technocracy

Before 1917, Russian industrialization advanced through the importation of machinery, ideas, and skilled engineers trained in the West. Like its Western counterparts, engineers and technologists in Tsarist Russia joined the civil service and filled

the lower strata of bureaucracy, while people of noble birth primarily occupied top positions. However, as historian Ron K. Rowney explains, this did not mean that the nobility had absolute power, for the sheer number of sub-elite, middle-class specialists in the Russian bureaucracy was large enough to influence decision-making.[3] Merchants and industrialists often triumphed over the nobility, who tried to cling to power by title alone. Nevertheless, the Tsarist system was developing at a pace equivalent to its western European counterparts in their respective industrializing periods.[4]

The revolution radically altered the course of technological development almost immediately. When the nobility fled their high-ranking positions during the revolution and the ensuing Civil War, tremendous vacancies appeared at high-level positions of power. Out of strategic necessity and practicality during the Civil War, Vladimir Lenin decided to move the technocratic lower level bureaucrats to the top echelons of power, where they assumed leadership positions.[5] Even in the later years of the 1920s and 1930s, when peasants and workers started to fill administrative positions, the technocrat-bureaucrats were still at the top. Although Rowney mainly focuses on the creation and staffing of the bureaucracy to determine if the revolution fulfilled its promises, his analysis also shows the high value placed on specially trained individuals.

Lenin was one among many leaders of the Soviet Union who believed that technology could transform Russia. Shortly after the revolution, he stated that:

> *I think we are now at the most fundamental turning point which, from every perspective, will mark the beginning of major successes for Soviet power… This is the beginning of a very happy era, when politicians will grow ever fewer in number… and when engineers and agronomists will do most of the talking.*[6]

Stites also points out that even though Lenin criticized many of his associates for thinking too "utopian," he nevertheless had a grandiose vision of the future that saw the electrification of the country as a major component in bringing about national unity.[7] Lenin was fixated on technology and believed that electrification was as important as winning the Civil War.[8] Not surprisingly, the first industrial buildings constructed in the new regime were electric power plants.[9]

Although Lenin's devotion to technology is essential to understanding the birth of the technocratic system, Bolshevik ideology alone was insufficient to catapult an almost religious devotion to technology. The engineers, physicians, agronomists, and various other specialized individuals who assumed power had been low-level bureaucrats trained under the Tsar. Without the previous emphasis for industrialization under the old system, technocracy would not have come from Bolshevik ideology alone.[10] The formation of the technocratic state depended on both the Soviets' exaggerated ideology and on the ideas of the techno-bureaucrats. This ideology was beneficial to those technically educated few, who, under the Tsar, would have never risen to the level of power that the Bolsheviks bestowed upon them.[11] Together, in an authoritarian state where the country's elite implemented political policy with few checks and balances, technocracy and faith in technology reached exaggerated proportions.

Soviet ideology is complex, and for the purposes of this paper, literature will illustrate Soviet ideology. The practical application of ideology illustrated in Fyodor Gladkov's *Cement* and Valentin Kataev's *Time, Forward!*, provide excellent examples of how Soviet ideology worked in theory. Both novels show how Soviet elites believed workers and administrators at the bottom of the social hierarchy were supposed to function. However, the system did not operate according to their vision. The two novels, first published in 1925 (*Cement*) and 1932 (*Time, Forward!*), work to funnel the top bureaucratic disputes into a practical working ideological model. In an authoritarian society where the state controlled publication, it is clear that what the authors conveyed was in line with party doctrine.

The American System and Soviet Ideology

As historian Robert Lewis correctly points out, there were two models the Soviets could have adapted for industrialization: the American system, which placed heavy capital into machinery to offset an unskilled labor force, or the European system, which emphasized use of machinery with artisan craft skill.[12] The continued migration of the peasantry into industrializing cities (with only a brief depopulation of cities during the Civil War) resulted in the availability of a vast unskilled labor pool. Therefore, the Soviets chose the American system. However, Lewis believes the adaptation of the American system to be a more politically motivated decision than an economic one.[13] In many cases, this may be true, but politics alone were not enough. If the American model was going to succeed, it was certainly not beneficial to have most of the Soviet Union's technologists swept up into the bureaucracy, for like in America, they were needed in the field. In any case, a foreign technological system was a better choice than any organic model that the Soviets could formulate at the time.

Using architecture for illustration, one can see that there were many non-political proponents of the American standardized and specialized manufacturing system. Many Russians viewed the United States as the most technologically advanced country in the world. Architect El Lissitzky glorified the American system in his 1930 *Russia: An Architecture for World Revolution*, saying, "In the course of a single century new production systems transformed all aspects of life. Modern technology not only revolutionized social and economic developments but aesthetic ones as well.[14]"

Although written in 1930, his statement characterizes the Soviet architectural community of both the 1920s and 1930s. Like many architects living in the Soviet Union (and technologists for that matter), he believed that they could pass the West in technological achievement. He argued that:

> *in America the architect has a direct and continuing relationship with technology. Perhaps this is why he does not ask more from technology than it can offer.… It is through technology that we can build a bridge to all the most recent achievements, which is what made it possible for our country to pass directly from the hoe to the tractor without having to travel the long path of historical development.*[15]

Architects placed such a heavy emphasis on the use of modern American building techniques, that when given only "secondary materials and leftovers," the architects constructed very little in the 1920s or the 1930s.[16] With very few resources at the disposal of leading architects, attempting to replicate modern American building techniques only held them back.

Lissitzky's belief that Americans did "not ask more from technology than it can offer," certainly characterizes the outlook the country's elite had in the 1930s.[17] Despite many shortcomings, the Soviets claimed to have many heroic successes during the 1930s. They attributed many of them to new technologies. These successes materialized in Soviet heroes and great construction projects, both of which placed man as the conqueror of his environment by his mastery of machine technology.

One *Time, Forward!* shock-worker (a worker who was part of a specialized group which continuously exceeded production norms) commented in rebuttal to the statement that "Nature conquers technique," replied, "But will it always be thus?…The laws of nature are immutable… but human genius is limitless…. I am an engineer, a Bolshevik…" and not only will the "machine attain the speed of sound" but it will "attain the speed of light and we shall become immortal."[18]

The giant steel producing city of Magnitogorsk, which was located amazingly in the middle of the barren Ural steppe, was a symbol of how man conquered the environment.[19] In *Time, Forward!*, Kataev described the transformation of the steppe, from an uninhabitable land into a thriving steel plant, through the eyes of his main character's wife, Fyenya. When she first saw the industrializing city of Magnitogorsk, she believed it was "neither steppe nor city," for she saw cranes, tents and barracks, along with blowing dust and barren landscape.[20] Magnitogorsk was in transformation; it was both steppe and city, implying that man's construction of the giant factory was conquering the environment.

The man-made lake near Magnitogorsk in *Time, Forward!* also revealed how man could triumph over the environment, over nature's laws. The lake's construction had been against better judgment—against tradition—yet the young engineer Margulies had conquered. He pushed the limits of the machinery available to him, and by experimenting with new construction methods, "The dam had been built."[21] Those who asked for more out of machinery, out of technology, prevailed. The American engineer in the novel, Mr. Ray Roupe, upon seeing the lake asked, "What else does humanity need, I ask you?" and removed "his hat with the respectable gesture of a civilized Christian upon entering a church."[22] Kataev demonstrates how American and Western enthusiasm for technology became part of Soviet culture as well.

In architecture, the Dnepr Dam mentioned earlier is a perfect example of the Soviet belief that machines could somehow control the natural world. Not only did the massive hydroelectric dam fit with Lenin's grand electrification project, but, during its 1927-1932 construction, it was a symbol of the entire first Five-Year Plan.[23] Anatole Kopp emphasized that it was an architectural work "without any concession to styles of the past;" even the stone facades exhibited "no attempt to imitate the traditional expressions of stone-cutting."[24] Although the dam was a great success, throwing off past cultural traditions was not always beneficial.

Foreign methods and building techniques were revered, but there was little precedent to enable the transition to run smoothly. The Soviets implemented new techniques and new technologies to show Soviet achievement, but were limited because they lacked the proper foundation to do anything on a massive scale. Jumping directly from the "hoe to the tractor" required more than just new machinery; it required a complete technological system to support it. That is why the Dnepr Dam project differed from other projects. It showed how Soviets believed technology could conquer nature and move beyond its limits. However, the special project's success was hardly indicative of the whole nation.

The Conservation of Time and Technological Organization

Not only were the size and scale of the American system important to the Soviets, so were its methods used to galvanize labor. With specialists and technologically religious Soviet leaders at the top of the hierarchical structure, a cult of Taylorism and Fordism appeared. Taylorism is an ideology that believes that there is a scientific method to labor organization and production, which if executed properly, greatly increases overall efficiency. Fordism, also of American origin, is assembly line mass production with an emphasis on the utilization of unskilled labor.

The Soviets believed that one reason for United States' prosperity was both Taylorism and Fordism. However, the Soviets took both of them out of America's cultural context. Since Lenin was such a strong supporter of Taylorism, the Soviet Union attempted to create a "scientific" bureaucracy.[25] It is an example of where Soviet authoritarianism pushed a foreign technological model into their underdeveloped system, resulting in numerous reorganizations in the 1920s. Historian Mary Conroy points out that this continual reorganization was detrimental to industry, and, in the pharmaceutical industry, "capricious reorganizations" were often destabilizing.[26]

The restructuring of bureaucracy came from Lenin's desire to attain efficiency not only from labor, but also from the Soviet administration as well. This is not surprising since he had elevated specialists into power for the very purpose of efficiency. Lenin stated that

> *The war taught us much… that those who have the best technology, organization, discipline and the best machines emerge on top…. It is necessary to master the highest technology or be crushed.*[27]

Lenin's comment seems much in tune with Stalin's later statement when, in 1931, Stalin said that if the Soviet Union did not industrialize in ten years, "they would go under."[28]

The Soviets wanted to apply Taylor's organizational efficiency to everything, and since extreme ideology was unchecked, they attempted to do so. As Stites points out, the 1920s was a period where the concept of time was greatly valued,[29] and under Stalin in the 1930s, it became essential. This Soviet Taylorist concept of time, which demanded efficiency out of everything, existed in both the twenties and the thirties.

Those Taylorists were both concerned with bureaucracy and labor, but differed in approach. The 1930s Taylorists operated under the Stalinist system, which placed the primary responsibility of time conservation on the workers themselves, for Stalin wanted to proletarianize the system.[30] Stalin believed that many officials were "bureaucrats with high opinions of themselves,"[31] and that on the shoulders of workers, not officials, would depend the "future of production in our entire economy… and the fate of our economic leadership."[32]

Gladkov's *Cement* is a novel that illustrates how many Soviets believed that industry would transform their lives; it also critiques bureaucracy, demanding efficiency from the new officials. Published in 1925 when post-Civil War reconstruction was under way, the novel illustrates the Soviets' technological drive through the channels of bureaucracy. In contrast, *Time, Forward!*, written in 1932 with a Stalinist emphasis on labor, reveals that the demands of efficiency were placed on the workers through shock-brigades. In *Cement*, the hero Gleb is the bureaucrat-worker who greases the wheels in the administration to get things done, emphasizing bureaucratic efficiency. He even allies with a foreigner who sided with the Whites during the Civil War because the foreigner's technical skills were essential to reconstruction. On the other hand, *Time, Forward!* focuses on a shock-brigade at Magnitogorsk who manage their time in order to beat world records and exceed quotas set by the government's central planning.

Although *Cement* provides the ideological context for bureaucratic refinement in the 1920s, K.M. Kerzhenstev, one of the leading proponents of Taylorism, implemented the ideological concept of bureaucratic efficiency in reality. Kerzhentsev was a member of N.O.T. (the Scientific Organization of Labor) and founder of the League of Time. He believed that every community, organization, or bureaucracy should carry "chronocards" to monitor efficiency and to record how they spent every half hour of their day for "self-discipline."[33] N.O.T. and the League of Time tried to use Taylorism to make up for the shortages of technically skilled workers, engineers, and resources in the 1920s.

Soviet ideological praise of Taylorism comes through in Gladkov's *Cement.* There are numerous passages in the novel where Gleb, workers, and other lower level bureaucrats demanded higher efficiency from the administration. When Gleb first returns to his home after the Civil War he finds the factory where he once worked nearly destroyed and in disrepair. One devoted worker condemns the Factory Committee for they were "chatterers" and were stricken with "idleness and jabbering… you can't do anything here with big words. These are machines, and machines are not words…."[34] Workers were idle because the bureaucracy spent too much time talking, and not enough time acting. In essence, the workers were ready to go back to work, if only Soviet administrators would do their jobs efficiently.

Cement clearly illustrates the author's initial frustration with early Soviet bureaucracy. In Gladkov's view, it took a man such as worker/soldier/Communist Party member Gleb to organize, plan, and reconstruct the factory. It was a matter of organization, and not a lack of resources or determination. As mentioned earlier, to get things done, he enlisted the help of an engineer, his "comrade technologist," who was the only foreign engineer who had not fled during the Civil War. Rebuilding the factory was more

important than old grudges. Through organization, the factory developed a persona all its own, transforming the decadent town into an industrializing socialist society.

The Soviets also tried to apply Taylorism to life outside the factory. In line with Soviet ideology, Constructivist architects (dealing with both the aesthetics and function of building design) believed that the organization of household duties and a new design of housing would not only reduce the time spent in household labor, but would create a new Soviet civilization. Like the French Revolution before it, the ability of the Soviets to blame the old regime for any setbacks their society may have had, gave rise to the belief that men could invent themselves anew.

The Constructivists believed in reinventing a new Soviet man. They believed that new modes of living, which demanded functionality and efficiency out of architecture, could change how people developed socially. Taylorism's application in architecture inspired architect Moisei Ginzburg's F-type housing unit, which he designed to "permit the organic integration of a public canteen, a kitchen, rest and reading rooms, baths, etc…."[35] Architects believed that communal utilities like "factory-kitchens" could liberate women from "household slave labor."[36] They thought communal activities were more efficient and economical because the time spent to manage household duties became equal amongst the entire community, which they believed would minimize time spent per individual. However, only a few of these Tayloristic communities managed to be constructed and implemented. Workers often rejected these projects of social engineering.[37]

Why were time and efficiency so important? A passage from Kataev's *Time, Forward!* best illustrates the ideological answer.

> *It consisted of this: increase of the productivity of one machine automatically entails the increase of the productivity of others indirectly connected with it. And since all machines in the Soviet Union are connected with each other to a greater or lesser degree, and together represent a complex interlocking system, the raising of tempos at any given point in the system inevitably carries with it the unavoidable-however minute-raising of tempos of the entire system as a whole, thus, to a certain extent, bringing the time of socialism closer.*[38]

In *Time, Forward!* a shock-brigade struggles to topple a rival brigade's cement mixing record. The leader of the brigade uses an issue of a technical journal called *Za Industrializatsiu* to get the latest time management news, for the shock-brigade workers were not under any direct supervision, and needed to optimize their own production. The bureaucracy, represented by *Za Industrializatsiu*, knew what was possible, and provided the brigade with the information they needed to know. It was up to the workers to put time management into practice to fulfill the demands of the Five-Year Plan.

The Soviet Union failed to produce efficient results using Taylorism and Fordism, because both systems were of foreign origin. Soviet work ethic was not on par with American standards. The Protestant work ethic provided Americans with an almost reli-

gious expectation for work success, and although Soviet bureaucrats may have adopted this vision, the traditional majority of Russians had not. Soviet administrators failed to associate technologies as a construct of culture, and in doing so, undermined success by adapting foreign ideologies and systems into a completely different framework. They definitely tried to make it part of their culture in the 1920s-1930s, but at the break-neck speed in which the Soviets were trying to institute the systems, there were many unnecessary setbacks.

The Stakhanovites

By the early 1930s, the bureaucracy lost control over time management as Stalin emphasized worker self-regulation, which evolved into Stakhanovism. Stakhanovism was a system where workers used time-efficient working techniques to exceed personal production quotas. Soviet administrators determined the production level requirements for any given job or task, and if an individual exceeded the norm by a large margin, they could potentially become a Stakhanovite. Shock-brigades placed efficiency in an elite working group; Stakhanovism emphasized individual success.

Historian Lewis H. Sieglbaum believes that shock-brigades and the Stakhanovite movement were experimental systems, which tried to replace the Taylorite system.[39] This is true. The Soveits were finally trying their own cultural way to institute Taylorism. However, time management was still very important, and workers during these movements often monitored themselves for efficiency. As mentioned earlier, Stalin's faith in the worker over the bureaucracy was extremely important, which follows Rowney's "proletarianization of the bureaucracy." Aleksei Stakhanov himself, founder of the Stakhanovite movement, wrote in 1936 that:

> *There are some who think that the Stakhanov movement is a variety of the Taylor system. Such a view is profoundly mistaken…. His system amounts to taking the result of the utmost exertion of effort by the strongest worker as the standard of output for all the others…. Stakhanovite work is a combination of manual and mental work. It enables the Stakhanovites to show their mettle, to display their faculties, to give free rein to their creative ideas; it signifies the victory of man over machine.*[40]

Nevertheless, the shock-brigades and the Stakhanovites are not completely independent of one another, and the Taylorist discussion in this paper must analyze them together. Despite Stakhanov's claims, an element of Taylorism still existed in the movement. Although the ideal Stakhanovite regulated himself, he would never amount to anything if not compared to the whole. Time efficiency was still dependent on the work produced by others.

However, this provides an example of where there was an attempt to merge the ideologies of American Taylorism and Soviet proletarianization. This is how a technological dialogue is supposed to take place. Yet, under authoritarian power, it had not. It took time for such an integration to occur, and it happened only after the Soviets made many destabilizing attempts to adapt American Taylorism wholesale.

Since this was mainly a top-down model, it had its problems. It was, nevertheless, a step in the right direction if any successes were to come from adapting foreign and American technological systems.

The Stakhanovite movement had many things in common with the shock-brigades. The Stakhanovite worker demanded more from machines than was thought possible. The shock-brigades, as in *Time, Forward!*, were precursors to the Stakhanovite movement. While the shock-brigades tried to break collective production records, the Stakhanovites emphasized individual labor achievements. The efficiency of individuals became equally important. However, the basic goal of both was the same, to get more out of machines. Accordingly, those officials in the bureaucracy who projected numbers that were too low compared to what was produced, found themselves arrested for wrecking activities.[41]

Soviet bureaucrats throughout Stalin's administration praised the idea of finishing the Five-Year Plans early. In Kataev's novel, a shock-worker contemplated the damage done to machinery when it was pushed past its limits, asking "which is more important: to finish the Five-Year Plan in four years or to save the machinery for an additional four years? The sooner we develop our industry, the less significance will amortization have for us: we'll make new machinery of our own."[42] Stakhanovites believed the same thing, and for a brief time in the early 1930s, trained foremen often succumbed to equipment overuse for fear of interfering in the movement. The government branded many as wreckers, responsible for "disorganizing production."[43] As Siegelbaum points out, this was during the Stakhanovite movement when workers briefly put managerial Taylorism in disrepute.[44]

Resource Problems of the 1920s and 1930s

One of the undermining components in utilizing the American technological model of industrialization was that the Soviet Union simply lacked the ability to harness the necessary resources for such a rapid adaptation of a foreign system. Examples within the architectural community can help illustrate the point. Konstantin Melnikov, who holds the record for having the most buildings constructed under his name in the 1920s (although only 20 of 80 proposed projects were realized), did so only because the majority of his structures were constructed of wood. Even Vladimir Tatlin's tower, exhibited in the Third Communist International, which became an icon of modern material construction, was made of wood.[45] Lissitzky tried to save face by saying that although Melnikov's projects were built of wood; they relied heavily on "modern wood construction methods."[46] In the industrial city of Magnitogorsk, one worker noted that even in the 1930s the "lack of various construction materials resulted in the most absurd shortcomings…" such as in twenty newly constructed houses, where bathrooms were "not supplied with electric light."[47]

Stalinists labeled the 1920s as an era of "paper projects," where ideas and plans existed more on paper than in reality.[48] A leading scientific advisor, G.M. Krzhizhanovsky, working with Lenin on the 1920 electrification project, asked if Lenin's plan was no more than a "scheme of electrification in a period of gigantic economic dislocation…

a fantasy, a utopia, a paper project?"[49] However, Lenin's electrification project was more than a paper project, for, as stated earlier, authoritarian leadership could push through grand projects without the proper foundation. During the first Five-Year Plan, the construction of the hydroelectric Dnepr Dam became a symbol of progress, and raw materials were not in short supply during its construction.[50] When it was possible, the Soviets utilized American building techniques.

Although the American system and its modern technologies won out as the best possible system to adapt to Soviet life, the 1920s' chronic shortage of resources made it an ideal that could not be achieved, further illustrating how foreign technological systems can not simply be grafted upon another. There can be an adoption of new technologies, if a proper foundation exists. In the Soviet case, its infrastructure was in its infancy. Heavy industry and resource production may have increased in the 1930s, but so much effort was concentrated on heavy industry that other areas of the economy continued to experience shortages. Furthermore, when new machinery and resources became available to specific industries, burgeoning industrial centers often lacked skilled workers to operate the machinery, resulting in overused, poorly maintained, or neglected equipment. The Soviet Union was increasing production, but at inconsistent levels.

The Worker/Bureaucratic Gap and Technology Preceding Specialists

Historian Hiroaki Kuromiya shows that there were extreme difficulties in rapidly mechanizing the labor force in the late 1920s to early 1930s. Looking at the coal mining industry, he argues that "the pit lived on its own, and so did the office."[51] This statement helps define the problems facing Soviet industry in the first two decades. As Soviet Politburo L.M. Kaganovich stated in a 1933 issue of *Pravda*, it appeared that when the Soviets used "more machines" for production, there was "less coal" extracted.[52] Kuromiya shows that this perception was a reality, and that productivity decreased with mechanization. The division between the bureaucracy and the workers was widening because more technically educated people found their desired jobs in Soviet bureaucratic officialdom rather than on the shop floor. The bureaucracy in coal mining alone had over twenty administrative and technical departments, and some officials had to be literally forced by law to work onsite to oversee production.[53]

The adapted American system was having problems. There had never been a dialogue between bureaucrats and shop floor engineers like in the United States. There were few tinkerers or broad-based technological enthusiasts communicating with the bureaucracy from the shop floor. Top-down direction concerning the proper use and maintenance of machinery fell on deaf ears. Those at the bottom of the hierarchy simply did not understand.

Technical literacy was scarce among coal miners in the early 1930s, and machines often broke down due to neglect and overuse. Kuromiya shows that "machine utilization was very low. Even according to official data, one-third of the available equipment lay idle in 1931."[54] The distance from the technocratic bureaucracy and the actual workers was vast, as Soviet faith in technology existed at the highest levels of society

with very few practitioners at the bottom. By 1940, there were 3,095 engineers in the resource rich Donbass region, but only 320 were actually working in the coal mining pits where expertise was in short supply.[55]

In John Scott's opinion, even when he was working in 1935 at the heavily funded steel manufacturing plant of Magnitogorsk, "most of the administrators were far from having mastered their jobs. They had not one quarter of the practical experience of men occupying similar positions in industry in America or Western Europe."[56] The issue of practical experience is a major one. Bureaucratic officials often had little experience, yet were making key decisions. A firsthand account from Maurice Hindus can illustrate one of many problems created from a technocratic bureaucracy without the proper specialist foundation. In the 1930s, Hindus, who resided in the United States, returned to the Russian village where he grew up to observe the new Soviet collective farms.

The officials at the collective farm Hindus visited had read about incubators in the Soviet press, which stated how much they could improve chicken production. When Hindus inquired about the incubators, the officials admitted that when the incubators arrived, "they discovered that none of us knew anything about them."[57] They ordered books, experimented, and were only able to hatch one percent of the eggs. Only after writing to the agricultural academy, who then sent out a specialist, did production actually increase with a seventy percent hatch rate. In this particular case, the technology was readily available, yet the specialists needed to operate the technology were not. How often did technological devices precede specialists? According to Kuromiya's evidence in the coal mining industry mentioned earlier, pretty often.

To combat this problem, Soviet administrators tried to standardize training concerning machinery. Siegelbaum argues that a program headed by Alexei Gastev of N.O.T. attempted to remove foreman specialists in order to maximize productivity.[58] Gastev insisted that each machine should have a "passport" card, which stated not only how to operate the machine, but what its capacities were.[59] Siegelbaum sees this as an experimental Soviet attempt to put workers in charge of their own production. N.O.T. also observed that the lack of specialists in the field necessitated the need for machines to be operable by unskilled laborers. The Soviets had not counted on having so many problems when using the successful American model of industrialization.

Scott observed a type of "passport" card at Magnitogorsk during the Stakhanovite movement:

> *it was plainly written on every motor in German and Russian that if the load exceeded ninety amperes the motor should be turned off. This was ignored, and it became the task of the assistant machinist to hold the breaker with a broomstick to prevent its kicking off when the load became too heavy…As a result a motor was burned out every two weeks or so. Nobody ever figured out how much it cost to rewind the motors.*[60]

Clearly, this is not a form of Western tinkering. Wanton abuse was often illogical and continued because there were only a handful of sparsely scattered engineers available to properly experiment or accelerate machine production. Properly labeling machines with "passport" cards did not solve the problem.

Siegelbaum points out that foremen, whose job it was to train and supervise how specific tools or machines were to be used, were not co-operative in stripping their own authority of instruction with cards, further hindering improvement.[61] Also blocking "passport" card implementation was that planners did not often agree on appropriate production levels for machinery, and the high turnover rate of workers reduced success.[62] Just as Gastev reacted to skilled labor scarcity, Scott believed that "the tremendous investment made by the Soviet Union in education was necessitated by the lack of trained people in every conceivable field."[63] Technology preceded specialists. Soviet faith in technology placed new machines in the hands of untrained and technologically illiterate workers.

Problems mounted as the country continued to industrialize, for all industrializing areas needed specialists to operate machinery. John Scott's documented personal account at Magnitogorsk and Maurice Hindus's observations illustrate problems in both industrial centers and collective farms. Throughout his narrative, Scott states many times that Magnitogorsk lacked trained personnel to operate the equipment. Historian Stephen Kotkin goes a step further and states that the "biggest shock construction site [Magnitogorsk]… did not have enough "labor power," even of the "unskilled" variety."[64] In the words of one official, Soviet specialists simply wanted the "quickest way out of Magnitka, at any price."[65] Scott does not comment on unskilled laborers, but in his account most engineers or trained specialists were often foreigners, like the German engineer in *Cement* or the numerous American specialists in *Time, Forward!*. As stated earlier, the Soviet bureaucracy lured the technologically literate with promises of a better, office-orientated career. This not only damaged output on the production floor, but left inexperienced technocrats in charge of central planning, who demanded ideological, and not practical efficiency. Here again the Soviets' adaptation of the American model proved detrimental. The United States had trained specialists in the field, for that was part of the technologically driven culture. The Soviet Union had not.

In Hindus' account, his village received a radio, and "unfortunately, nobody in the *kolkhoz* or in the village understood the mechanics of the radio and whenever anything went wrong, which happened often, they had to send for a repair man, five miles away."[66] However, when the radio was working, Soviet faith in technology persisted. Members of the collective farm asked Hindus how their radio compared to radios in America, and the general belief grew that there would be "a more cheerful winter because of the diversions the radio would furnish."[67]

While working at Magnitogorsk in the 1930s, Scott visited a nearby collective farm where he found that only three of twelve tractors the farm was supposed to have were functioning. Officials at Magnitogorsk sent Scott and some German engineers to repair the tractors. In three days, they had repaired nine tractors before they

had to leave because "several of the German mechanics were badly needed back in Magnitogorsk."[68] Many of the tractors had sat out in the dust or snow all year round, and the farmers simply neglected them. One farmer used and praised a tractor that he discovered could boil a large amount of potatoes![69] Without any specialists or proper training, equipment quickly became unusable.

Hindus's observations of tractor use on the collective farm he visited compares equally with Scott's experience. In his experience

> *one seldom sees a Russian tractor operator who, on his way to and from work, does not race the tractor as though it were an automobile. He glories in fast movement. The resulting breakage is colossal. Fleets of disabled tractors dot the Russian landscape; and what is true of tractors is true of other machines… machines are left with no cover over them in yards and in far away fields, exposed to the devastation of wind, rain, and sun.*[70]

Although simple neglect was a key factor, the lack of trained specialists able to repair and to instruct others in the proper use of the machinery hurt overall production. Asking more out of the machine or believing that it was best to overtax a machine to meet or exceed the production quotas of the Five-Year Plans were detrimental to success. The adapted American system helped standardize Soviet production, but it could not transform society the way the Soviets believed that it would. As stated earlier, it was not helpful to promote the few-trained technicians the Soviet Union had to prominent levels of administrative power. What little foundation the Soviets had for success, simply dropped out as technologists moved up the echelons of power.

Politics and Technocracy

What did mid-level technicians say about the orders from on high? Historian R. W. Davies argues that many specialists believed that Politburo S. Kosior's 1930 critique of central planning was correct. He stated that, "in many factories and mines the management and technical personnel formed the firm opinion that the programs are exaggerated and cannot be fulfilled."[71] Davies correctly argues that the relationship between politics and technology was complex. In her words, there "was a dialogue, not a simple *diktat*."[72] However, the dialogue she refers too was not a bottom to top communication. In most cases, the dialogue never escaped high-level Soviet administrators. Nevertheless, Davies argues that the high production levels of the first Five-Year Plan were not repeated in the second because of numerous administrators' resistance to detrimentally high production levels.[73]

In terms of research and development, there were many cases where politics favored certain technologies, and many cases where technologies developed despite political disapproval. The idea of having a tank turret produced as a whole unit, rather than by having separate pieces welded together for completion, was an innovation originally rejected by Stalin. Only with persistence and compromise did high Soviet officials get Stalin to recapitulate.[74]

There were even cases where Stalin was unaware that the developments of particular projects he supported were halted by technical specialists, such as the plan funded by the military which tried to make tank armor resistant to both shells and bullets. They shelved the absurd project without Stalin's knowledge.[75] If there was any information coming from the bottom, it was not through shop floor innovation, but through theft. Soviets working in Western industries simply stole technologies by taking schematics, or hand drawn pictures of the latest Western machines into the USSR.[76]

Using Davies's complex dialogue assessment, one can see that technology did not always trump politics, and politics did not always win over technology. Historian Mary Conroy points out that, in the pharmaceutical industry during the NEP (New Economic Policy), retooling factories with new equipment was not an easy process. In one particular case, administrators in the Vesenkha (the Supreme Council of the National Economy) blocked the modernization efforts of the Gosmedtorgprom Pharmaceutical Trust. The trust modernized only at the wishes of the central planning leaders, and "was constrained by the macroeconomic environment in the Soviet Union."[77] The Soviets often implemented new technologies in particular industries over others, but in this case, Soviet bureaucracy simply hindered modernization.

On the other end of the spectrum, technocrats were sometimes more important than politics. In the 1930s, some leading technologists did not have to concern themselves with Stalin's political purges. As one case example in architecture, Stalinist architect Karo Alabian tried endlessly to oust prominent members of the architectural community like Aleksei Shchusev and Konstantin Melinkov.[78] Both Nikita Khrushchev and the Moscow Central Committee ignored Alabian's pleas to purge leading architects.[79] As a result, the regime arrested or purged very few leading avant-garde architects.[80]

Just because Soviet officials were reluctant to purge prominent architects does not mean that it did not occur in the architectural community. It is simply pointing out that the technocratic structure of the Soviet system valued trained specialists. Melnikov not only survived the purges, he lived in a private house that he personally designed at the height of the communal housing debates in 1928.[81] In this circumstance, Soviet ideology valued technologists over socialist ideals, which is also apparent by the number of foreign specialists present in Soviet industry during the early 1930s. Davies is correct in asserting that the dialogue between technologists and politicians was complex, with both sides having influence over political and economic decisions.

Problems with Technocracy

The problem with Soviet faith in technology was twofold. On the one hand, Soviet leaders viewed technology as an almost supernatural force, by which men became masters of the environment. The Soviets perceived technology to be a separate entity, isolated from man. For this reason, the Soviets viewed American success on a technologically deterministic model. The Soviets failed to view their success in a cultural framework. This proved detrimental, and fostered the belief that, if they could not rapidly industrialize, it was because man failed to use the machinery provided to him

properly. If the Americans could progress industrially by adapting specific systems, then the Soviets believed they could, too. This is the very reason why the Soviets implemented time management. When central planning failed to produce its desired goals, machines were not at fault. It was the people using them. Human organization was to blame. The Soviets' faith in technology was so intense that when the system failed to produce their projected production levels, they looked inward for answers.

Efficiency in human capital was a scapegoat for the second problem. As Rowney's analysis has shown, the government in the late 1920s and early 1930s was in the hands of a technological elite. With such a transformation, a top-down technological drive rapidly progressed. While some bourgeois specialists fled during the revolution, others were enticed with promotion and white collar jobs in the new Soviet administration. The result was that specialists at the lower end of the social structure became scarce.

This second problem, the absence of qualified technologists at the lower levels, created an enormous problem for a country adapting to Western technological systems. When something broke down, few people could repair it. Furthermore, there were not always capable people present to operate complex machinery. At times, equipment sat idle, while continuing pressure from the technocratic elite rained down. In terms of technology, the Soviets built a house without a foundation. The Soviets had wanted a technical society, but lacked a technological system to carry out the high demands of industrialization implemented from above.

Conclusion

Soviet faith in technology was not practical given the circumstances the Soviet leadership found themselves in during the 1920s-1930s. The system lacked a solid foundation upon which to implement new technologies. The Soviet example shows how technocracy can strain a system, especially with most of the Soviet Union's specialists having been absorbed into the bureaucratic structure. The continual search for efficiency and maximum productivity slowed down development. It also provided for an atmosphere too rigid to accept failure. When problems arose, the government tried people as wreckers and purged them. Faith in Taylorism made Soviet officials blame individuals, and not the system, because to them, a technocratic system was flawless. As has been shown, Soviet ideology considered technology to be a separate entity, void of limitation. In accordance with Lissitzky's belief, machines were capable of much more than perceived by man.

From this analysis, Soviet technocracy helped justify Stalin's political purges. It was not the major contributor to the purges, but its search for efficiency certainly gave it support. The system was supposed to run efficiently by scientific Taylorist design, and if it did not, the Soviets believed that it was simply a matter of tweaking the system to make it work. This type of scientific outlook, which faulted man with the inability to make a perfect system operable, endorsed purging. Faith in technology played an influential role. As indicated in the community of architects, the system spared leading specialists from the purges if they did not accredit them with drastic failure. This further showed the Soviet's extreme devotion to technology and specialists. With specialists at the top of the hierarchy, they were able to cast blame down the social ladder.

It goes without saying that good intentions met with bad results. From Lenin's belief that electrification could unite the nation to the shock-worker noted in Kataev's novel that believed that if a machine's speed increased, socialism would come sooner, Soviet faith in technology had impractical utopian aspirations. This, combined with the Soviet's praise of specialists, enabled technologists to advance through the ranks to leading administrative positions, and the bottom dropped out of the system.

A technocracy cannot survive without anyone working in the field. Soviet faith in technology was yet another example where ideology met with mixed results in practice. Soviet industrialization did not have to be so difficult and so fast. Faith in technology was beneficial in spurring enthusiasm and driving change, but faith alone was not enough in a country where its leaders praised technology almost religiously, and where technologies preceded specialists. Soviet technocracy had strong support at the top, but lacked a practical technological foundation. Industrialization, people, and the economy suffered as a result.

SWEETS TO THE SUITES?—
The Preservation Challenges of an Abandoned Sugar Beet Factory

Debra Faulkner

Boettcher and the Beet

Few visitors who travel to Europe return without souvenirs of some sort—leathers from Spain, laces from Belgium, perfumes from France. But when wealthy Prussian immigrant and Colorado capitalist Charles Boettcher journeyed with his wife Fannie to the continent in the late 1890s, his accommodating spouse emptied an entire trunk to make way for some very unusual—and bulky—souvenirs of Germany. Charles bought sugar beets. Lots of them, along with selected seeds and the detailed plans for sugar refining plants, which would allow him to experiment with replicating the success of the German sugar beet industry in Colorado.[1]

Sugar beets had been introduced in the state decades earlier. But the need for reliable supplies of water and efficient transportation, coupled with the distracting silver fervor of the 1870s, led most would-be sugar producers to abandon their efforts.[2] In the aftermath of the 1893 Silver Crash, Boettcher understood two important things. First, that Colorado needed desperately to diversify its economy and create new industries to fill the vacuum left by the mining recession. And second, that the key to successful sugar beet operations was to build the processing plants right in the midst of the fields where they were grown.[3]

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The Dingley Tariff Act of 1897, which provided protectionism for U.S. manufacturers by imposing unprecedented high taxes on imported products, made beet sugar production much more profitable.[4] Boettcher and his fellow investors—John Campion, William Bird Page, James McKinnie, and the Havemeyer family—organized as the Great Western Sugar Company in 1905.[5] Great Western (GW) arranged for water rights to irrigate the beet fields during the crucial final months of maturation and railroad lines to facilitate shipping harvested beets to nearby factories for processing and refined sugars to distributors. Boettcher's own Ideal Cement Company provided the concrete used in much of the factory construction, particularly the huge storage silos.

The new sugar beet company was an immediate success. A $3 million industry by the early 1900s, Colorado sugar manufacturing employed more than 9,000 statewide by the 1920s.[6] Boettcher's built his first sugar beet factory in 1901 in Loveland, a small agricultural community along the northern front-range. The State Agricultural College (now CSU) in neighboring Fort Collins performed analysis which had shown that the soil and climate conditions in the South Platte River Valley on the high plains were ideal for nurturing the ugly tubers.[7] Sugar beets are generally planted from mid-April to mid-May and take about 190 days to mature. In the final months of growth, the beets, which weigh an average of five pounds each, need lots of water to produce the highest sugar content.

An extremely labor-intensive crop, sugar beets provided jobs for many Coloradans, giving local economies a major boost wherever they were grown and processed. Initially, Russian-German immigrants, the *Volga Deutsch*, supplied most of the "stoop labor"—hoeing, planting, weeding, thinning, and topping the beets. Japanese and other immigrant groups joined them in the early decades of the twentieth century. By the 1920s, Mexicans made up the majority of sugar beet field hands.[8] The work was brutally hard, but whole families toiled together in the fields, even young children. Only those too little to stand or walk for long periods stayed home—usually unattended. Those who worked hardest sometimes got the opportunity to move up from common laborer to supervisor and possibly even small landowner.

The processing end of sugar beet production employed more skilled workers, including chemists. But this, too, was difficult, smelly, unpleasant work for the most part. Converting the beets to sugar entailed slicing, boiling, mashing, purifying with lime, boiling the syrup, augmenting with other sugars, centrifuging to filter out crystals, powdering, and packaging.[9] During peak times around harvest season (mid-October to mid-November), factories operated around the clock, befouling clear skies with noxious smoke and putrid steam.[10] But such was the nature of the industry. Industry meant jobs, and jobs meant a healthy economy. The unpleasant smell that rarely wafted all the way into nearby communities seemed a small price to pay for steady prosperity.

The sugar beet industry sustained small agricultural towns throughout the northern front-range region for much of the twentieth century. In addition to Loveland, Great Western operated factories in Greeley, Brighton, Johnstown, Longmont, Windsor, Eaton, and Fort Collins. On the state's western slope, American Sugar factories prospered in

Grand Junction and Delta. The towns of Fort Morgan, Sterling, Ovid, Lamar, Las Animas, Swink, Holly, Brush, Sugar City, and Rocky Ford were also sugar beet centers.[11] Colorado ranked eighth among sugar-producing states. By the 1950s, GW was the largest producer of beet sugar in the nation, with assets exceeding $80 million.[12]

The Loveland GW plant filled its one-millionth bag of granulated sugar in 1958.[13] The closely related candy industry also thrived around the state, including manufacturers such as Bauer's and Russell Stover in Denver, Jolly Rancher in Wheatridge, Enstrom's in Grand Junction, and Durango's Rocky Mountain Chocolate.[14] Sugar beet factories also produced liquid protein from beet pulp as livestock feed and potash for fertilizer. The GW Johnstown plant manufactured the flavor-enhancing chemical MSG beginning in 1954. But by the 1970s, the industry's fortunes were reversing.

Decline of the Industry

American eating habits and ideas about nutrition were changing in the last quarter of the twentieth century. Sugar produced by refining beets was far from the purest, most natural form of sweetener. Concerns also began to grow over environmental pollution from the manufacturing plants.[15] Despite high tariffs on foreign sugar, the beet industry faced competition from cane sugar producers in Louisiana, Puerto Rico, and Hawaii, who could produce sugar much more inexpensively.

Disputes between labor, the growers who formed powerful self-interest organizations, and the beet sugar companies (particularly GW vs. American Sugar Refining) led to higher production costs.[16] "In the early to mid-1970s, the company [GW] suffered from low profits and even lower morale with multiple management changes that wound up in the papers. After a very public and nasty hostile takeover bid by the Hunt family of Dallas, the company's misfortune ended with the 1974 sale to Dixieland Foods."[17] Some credit Great Western's downfall, at least in part, to mismanagement by Bill White, who took over as CEO in the 1970s.[18] As the cumulative consequence of multiple factors, the Colorado beet sugar industry went into a tailspin in the 1970s from which it has never recovered. Great Western embarked upon a series of employee layoffs, and one by one, closed or sold off its factories. In 1984, GW slid into bankruptcy.[19]

The Loveland Facility

Charles Boettcher's flagship factory, the Loveland processing plant, was dedicated on November 21, 1901, before a cheering crowd of 3,000. The community had raised $500,000 to subsidize its construction.[20] For six subsequent decades, GW was the small agricultural services town's largest industry until eclipsed by Hewlett-Packard in the 1960s.

A scale model of the facility, created using 1921 blueprints and historic photos, is currently on display as part of the Great Western Sugar exhibit at the Loveland Museum and Gallery. The model provides visitors a bird's eye view of the more than twenty-five structures comprising the plant, including circular metal storage bins, the boiler house, the packaging and bagging plant, centrifuges, drying beds, lime kilns, beet scales, railroad-related structures, and the administration building.

The first four concrete storage silos were added to the facility in 1955, each 25 feet in diameter and 160 feet tall. Four more silos added ten years later increased the plant's total storage capacity to 1.2 million cubic feet—enough to hold 600,000 100-pound bags of sugar.[21]

The Loveland sugar beet plant ceased operations in 1985. The site, which once stood many miles from the center of town, now saw the encroachment of residential developments and retail and office parks. The property was subdivided and sold to satisfy creditors in the early 1990s. The most commercially attractive portion, along Highway 34 east of town, was snapped up first and developed to include a Sam's Club, a Lowe's Home Improvement, smaller retailers, and the city's third high school. Five different property owners purchased the remaining pieces. Amalgamated Sugar secured the silos and the rail access. According to Larry Walsh, Mayor of Loveland, they still store and bag sugar and repair locomotive engines there.[22] The City of Loveland owns another piece, including a building where they store sand and salt for the highway department. Nathan Klein, of the Loveland Commercial, said that a man and his son purchased the two most substantial buildings, then gradually dismantled one of them to sell the bricks whenever they needed money.[23]

The eight gleaming white silos still stand like beacons on the prairie. The smokestack looms even taller. Most of the structures, made of corrugated metal, are collapsing and rusted. The brick Administration Building is shabby and neglected, listing toward the sunken southeast corner where the foundation has collapsed. The hand-printed sign that greets visitors to the site warns "Resident Gaurd [sic] – KEEP OUT."

For those who remember the factory's glory days and its role in the community history of Loveland, it is a sad sight. But what can be done? Can any of the structures be saved and rehabilitated for new uses? Is preservation a realistic possibility, or should the site simply be scraped and obliterated?

Redevelopment Possibilities and Issues

Loveland Commercial presented a plan for redevelopment of the former GW site to the Planning Commission in August 2004. So confident was the firm of its proposal that a key partner in Loveland Commercial, Don Marostica, resigned his position on the City Council to avoid any appearance of conflict of interest.

Alicia Herbstreit began her *Reporter-Herald* story about Loveland Commercial's proposal with, "Local developers plan to give a city eyesore the facelift it deserves."[24] The developers asked the Commission to annex and rezone the twenty-seven acres and to create an Urban Renewal Authority project area. Marostica's partner, Eric Holsapple said, " We certainly recognize its [the site's] great importance to the history and culture of this city."[25] Loveland Commercial explained that after cleanup of the site (including asbestos abatement and removal of decaying structures), they intended to preserve and restore the Administration Building and to use old bricks and industrial architectural styles to recreate the feeling of the factory that used to be there with new construction. The silos, maintained in excellent condition, would certainly continue to stand. A professional assessment of the viability of the smokestack revealed that it would

cost nearly as much to take it down as to stabilize it to a safe condition.[26] The Junction Business Park the Loveland Commercial partners envisioned would be a campus-type setting for small corporations, similar to the Denver Tech Center or Interlocken.

The Planning Commission promptly shut down Marostica and Holsapple on a technicality, temporarily freezing Loveland Commercial's plans.[27] By the time their proposal again came before the Commission for a vote in November, battle lines had been drawn. Holsapple told the *Reporter-Herald,* "We really were trying to do a community service. We thought it would bring the community together doing this project, but it's had the opposite effect."[28] Conflicting viewpoints stemmed from the developers' request for an Urban Renewal Authority to help fund the cleanup and redevelopment of the site. The projected property tax revenue from businesses that located in Junction Business Park would subsequently repay the city.[29]

Mayor Larry Walsh saw it quite differently, believing that the plan would incur a huge debt for the city to the developers' financial benefit by funneling nearly $30 million in tax revenue into an Urban Renewal Authority for the next five years.[30] Mayor Walsh saw Loveland Commerical's plan as more in their own interest than in the community's and suggested instead that the City itself buy the property, clean it up, and resell it to potential developers—something unprecedented for Loveland government. Walsh estimated the purchase cost to be $1.8 million, and "clean-up" an additional $1.2 million.[31] The resulting stalemate led Loveland Commercial to withdraw its proposal and back out of its plans for the site. More than two years later, nothing more has been done to either purchase or redevelop the property. Its fate remains in limbo.

"I don't know if it [redevelopment of the site] will ever work for anyone," a disillusioned Don Marostica told the *Reporter-Herald.* "It will be interesting to see what happens over the next 10 or 15 years."[32]

Fates of Other Factories

The question of what is to become of abandoned sugar beet plants is not unique to Loveland. Similar dilemmas face many Colorado communities with historic sugar factories on their outskirts. The following summaries illustrate the diverse responses to those dilemmas around the state.

Greeley

The 104-year-old sugar beet plant outside of Greeley went on the market in January 2006; asking price: $14.2 million. Western Sugar Cooperative decided to sell the 200-acre site, citing the rising cost of operating it on natural gas. Since its purchase by the cooperative in 1985, the plant has been used primarily to store sugar beets until they could be shipped to Fort Morgan for processing. The sellers emphasize that the plant could easily be converted to produce ethanol or bio-fuel. But it is associated water rights—936 units of Colorado-Big Thompson—that tempt most potential buyers, including the City of Greeley.[33]

Longmont

City Transportation Planner Phil Greenwald reported that the old Longmont sugar factory, closed since 1977, is envisioned as a T.O.D. (Transit-Oriented Development). Proposals include integrating the site into the Longmont-Diagonal Commuter Rail (not LightRail) system as a possible Park-n-Ride and multi-use development, including an office park, mini-housing, and possibly even a private or community college campus. The present owner, who uses the plant primarily for storage, is currently negotiating with the City of Longmont regarding purchase. The contentious issue of the water rights has led to the current stalemate and Longmont's current "hands off" policy. Other major issues include how—or even if—the rails currently in place would integrate with RTD's system, and the estimated $30 million expense of cleaning up the site.[34]

Brighton

The 2005 EPA Conference held in Broomfield used Brighton's old sugar beet factory site as a model for study. Their two-day inspection, discussions, and brainstorming sessions focused on several possibilities, including restoring the structures and converting them for light industry such as candy manufacture, and continued use as storage facilities with mixed retail uses surrounding the site. Manuel Esquibel, Brighton Assistant City Manager, mentioned one large, well-maintained wooden structure that he believes would make a great indoor basketball court. The City of Brighton is considering an Urban Renewal Authority for the site, with an eye toward future redevelopment. GW performed ground testing years ago and found no contamination to report, but Esquibel noted that the structures contain lots of asbestos, and in general, the plant is in bad shape.[35]

Johnstown

Operating from 1927-1977, this GW plant produced MSG. The facility was purchased in 1999 by Colorado Sweet Gold, LLC, and converted to manufacture high-fructose corn syrup, organic cornstarch, and livestock feed. Colorado Sweet Gold's Johnstown operation was nominated by the EPA for an External Environmental Achievement Award for reducing the use of hazardous substances in its processing.[36]

Windsor

Windsor Museum Director Cindy Harns explained that Windsor's GW plant closed in 1967. It is currently owned and operated by Universal Forest Products for lumber processing. Universal Forest utilizes the site's rail access, and the old smokestack and Administrative Building are still intact. Little development has encroached upon the site, despite Windsor's explosive growth, because it is surrounded on three sides by a cemetery, a town park (Chimney Park), and a ball field.[37]

Delta

A remnant of the Delta sugar beet factory survives as part of the Uravan Superfund site in western Colorado near Montrose. Though the town of Uravan was demolished during "remedial activities" at the site, two historical structures were spared. One of

these, the Community Center, was built in the 1930s of materials from the dismantled Delta factory. It served as a multi-purpose recreation center for company workers and, more recently, as a storage and display facility for historical artifacts related to the site.[38]

Fort Morgan

The Fort Morgan plant still processes sugar beets, though residents complain about the odor and the dust it also produces. Production has declined in recent years due to drought, low prices, and oversupply, but members of the Western Sugar Cooperative are hoping for a rebound. As Greg Griffin reported in his February 17, 2006, story for the *Denver Post,* "[Hurricane] Katrina knocked out sugar cane production facilities in Louisiana last fall, reducing sugar supply and sending prices to their highest level since 1980."[39] Rising demand for ethanol, a gasoline substitute that can be derived from sugar, is also pushing up prices. With the current President's call for alternative energy sources, ethanol production has the potential to reinvigorate the Colorado sugar beet industry.

Conclusion

The many sugar beet factories that still dot Colorado's northern front range, eastern plains, and western slope are architectural white elephants without peer. Though they occupy prime property just outside the city limits of many growing communities and include valuable water rights and rail access, most of the industrial structures are rusting and collapsing. Unlike other industrial relics, such as flourmills, feed plants, and packing plants, these remaining structures do not easily lend themselves to rehabilitation as loft apartments or office complexes. Saving them—if they can be saved—will require some real "outside the box" thinking.

Creative minds are rising to the challenge. In the case of the Loveland plant, some have suggested that the brick Administration Building might be appropriately rehabbed as a museum dedicated to telling the story of Colorado's sugar beet industry. But, as is the case with so many historic buildings, the cost of any rehabilitation would be far greater than the cost of completely demolishing the structure and building something new. Others point out that the 125-foot silos would make an impressive base for a revolving restaurant with an unequaled view of the front-range and the northern plains. Dauntless visionaries have even eyed the concrete silos as possible shells for unique living spaces, comprised of multi-level 25-foot diameter circular rooms. [40]

Home to half-a-dozen art casting foundries, Loveland's current cache is that of sculpture capital of the west. Surely it is only a matter of time before someone looks at the imposing silos and thinks "pedestal." Perched atop the gleaming white towers could be a stylized sugar beet, a monstrous version of the one crowning a pole across Sixteenth Street from the Sugar Building (between Wazee and Blake Streets) in downtown Denver. A giant sculpture of a sugar beet field hand would be an equally fitting tribute. As precedent, just such a statue graces the entrance of the Longmont Museum.

Or perhaps, in contemplating an appropriate topper for its old GW silos, Loveland should harken back to its original cache as "Sweetheart City of the West" and consider a depiction of Cupid in clichéd cowboy gear. This final idea inspires a closing ode.

Valentine for a Faded Factory

Roses are red, violets are blue,
Sugar was sweet, but GW's through.
The Loveland facility, still so imposing
Awaits gentle rehab or heartless bulldozing.

It stands as reminder of ag business past,
The Boettcher experiment, bold to the last.
Where soil met science, employment was spawned
And propped up economies, plains and beyond.

The beets were unbeaten, for decades the trend.
But cane sugar rivals at last spelled the end.
The factory abandoned, its old structures rot,
But eyesore or icon, it's Loveland's "sweet spot."[41]

THE POLITICS OF WILDERNESS DESIGNATIONS:
Controversies Concerning Rocky Mountain National Park

Jean Kingston

The idea of protecting tracts of wild public land from development led Forest Service employee Aldo Leopold to create the Wilderness Society in 1934. This organization was dedicated to seeing Leopold's vision encoded into federal law in the context of a booming economy and expanding industrialism. By the 1950s, serious but unsuccessful attempts were made to pass such a bill. Finally, in 1964, the Wilderness Act became law, designed to carve out areas of the country in which human agency would be absent or minimal. These lands would be left to natural processes, labeled with a "Wilderness" designation.

In response to the efforts of wilderness advocates, much acreage in public lands was administratively classified as wilderness in the decades preceding passage of the wilderness bill. With the 1964 bill came the creation of the Congressional designation, often referred to as "big 'W' Wilderness." The 1964 act, in addition to defining wilderness and creating the National Wilderness Preservation System (NWPS), simultaneously classified approximately nine million acres of National Forest as wilderness. Under the act, within ten years of passage, another administrative review of potential wilderness land was required. Recommendations were to be made based on this survey. Any federally owned primitive area of at least five thousand contiguous acres would be considered for wilderness designation. The act

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excluded from consideration land with significant road, structures, or other evidence of "permanent improvements or human habitation."[1] It also required Congressional approval to apply a wilderness designation to additional parcels.

In addition to the original lands embraced in the National Wilderness Preservation System by the 1964 act, almost one hundred million additional acres have been included. As of 2006, about four and one-half percent of the United States is protected by this designation, with almost half of this acreage in Alaska. Colorado ranks fifth among the states in its number of wilderness areas, and seventh in total acreage.[2]

The full story behind the Wilderness Act is one in which Colorado was the major player among the states. The concept of protecting wilderness enjoyed diffuse popularity among the general public in the 1950s, particularly in the eastern and mid-western states, but faced fierce opposition from minority, yet well-organized interests in the west. Ranchers, farmers, loggers, and miners who had long enjoyed benefits from public lands, were not inclined to support cordoning off sections for the pleasure of elite recreationists. And these factions had a powerful champion in the chair of the U.S. House Committee on the Interior and Insular Affairs, Wayne Aspinall.

As committee chair, Representative Aspinall was the major force in stalling the legislation in the 85th, 86th and 87th Congresses.[3] He demanded—and got—lengthy hearings; he required administrative apparatus be in place before House decisions were made. Despite Senate approval in the 87th Congress in 1961, the House still failed to act; Aspinall was the lead obstructionist. It was clear to the representative, however, that a bill would eventually pass in some form; his intention was to shape it in such a way as to provide the greatest protection for commercial interests specifically and the state of Colorado generally. The bill finally passed the House in 1964, aided by Congress's desire to enact the agenda of the recently slain president, but it bore the Colorado representative's imprint in several ways. First, it allowed for mining claims[4] to continue on these lands for twenty years. Secondly, through grandfathering, it permitted interested parties to pursue, at the President's discretion, water projects and other activities generally prohibited in wilderness areas. Finally, the legislation required Congressional approval of a wilderness designation for all subsequent parcels of land. This latter provision, relentlessly pursued by Aspinall, effectively gave state delegations a veto power over wilderness decisions. Most importantly to Aspinall, it prevented unelected administrators from making decisions for which they would not be held accountable by voters.[5] Steven C. Schulte, Aspinall's biographer, states, "To claim that Aspinall, more than any other individual, both delayed and shaped the ultimate form of the Wilderness Act is no exaggeration."[6]

Originally, many people dismissed the idea of using this designation for any national park lands. They not only thought such lands already enjoyed adequate protection but were concerned that such a designation would interfere with the park's mission of providing accessibility and recreation. A designated wilderness area does not preclude public use. The goal of conservation is such that the land retains its natural character and humans are merely visitors, thus relegating public use to a subordinate position. Today about two-fifths—between forty-three to forty-four million acres—of officially designated wilderness lies within national parks. Furthermore, much of

the land in national parks that is not designated as wilderness is administered so as to preserve its wild character. Such was the case in Rocky Mountain National Park (RMNP) even prior to the recommendation made in 1973 that it be so designated.

When considering a wilderness designation for Rocky Mountain National Park there are two critical questions. First, given the Park Service's treatment to date, what was the added value of the wilderness designation? Secondly, in spite of the seeming widespread support for such a designation, why has it been unsuccessful thus far?

The value of a wilderness designation in the twenty-first century remains the same as when it was at the time of its creation in 1964, when only an administrative designation existed. The proponents of the new designation sought a higher level of protection, one that could not be easily changed. Initially, wilderness proponents wanted the Department of the Interior to have the authority to add lands to the National Wilderness Preservation System. They hoped that parochial commercial interests like mining, grazing, logging, or the like would exert less influence over NWPS officials. Instead, they had to accept a system that mandated Congressional approval, resulting in more special exceptions and considerations granted for the administration of much of the additional land than would have otherwise been the case. Under this system, the addition of each new parcel to the Wilderness Preservation System in effect constrains the options of citizens in the future. This defining element of the system is much of what attracts its proponents and disturbs its detractors. In some cases, however, the designation terminates business activities on the land.

Regardless of the claim that most national park lands are already administered as wilderness areas, the designation may provide a higher level of protection from outside threats. Land that is identified but not yet designated for inclusion in the NWPS is administratively protected from development. This is not the same as subordinating all uses to the primary goal of retaining the land's wild character. In 1996, for example, the laws forced some power plant operators in Colorado to pay fines and retrofit their equipment to reduce air pollution that was interfering with visibility in the Mount Zirkel Wilderness Area. The 1964 Wilderness Act provided the federal government with the authority to compel such compliance.[7] While the Forest Service—not the Park Service—administers Mount Zirkel, this example illustrates the power of the wilderness designation.

The image of designated wilderness remains that of untrammeled land as Howard Zahniser described them. Most people credit Zahniser as the author of the wilderness legislation. The 1964 Wilderness Act includes a description that the land is "without permanent improvements or human habitation" and generally prohibits business activities, as well as roads, mechanical transport, or any type of structures. Perhaps less well known are the many exceptions to this ideal. The act included provisions that grandfathered certain activities such as mining, and allowed exceptions for roads needed for firefighting or other safety concerns. It also permitted the use of motorized transport where previously well established.[8] Many subsequent designations likewise provided for special use. Trail building, pit toilets, patrol cabins, bear-proof metal lockers, as well as the use of chain saws and dynamite, are just a few examples found in wilderness areas.[9] They seem to violate the vision of a pristine wilderness, yet are

legal under the designation because they are required to administer the area for "the health and safety of persons within the area."[10] The initial widespread support for the use of the wilderness designation for appropriate parcels of federal land eventually lessened, perhaps less from pressures of business interests who originally opposed it, but rather from recreational users, who want access for motor boats, snowmobiles, and off-road vehicles.

The politics of wilderness designations is twofold. First, what began as a bipartisan issue turned more divisive by 1980s. Newly elected Republican president Ronald Reagan championed the so-called "Sagebrush Rebellion" in the West, which advocated more local control over federal lands. Reagan's head of the Department of Interior, James Watt, fully endorsed the policy. Since that time, Democrats have generally been favorably disposed towards adding lands to the wilderness system, while Republicans have mainly been opposed. Secondly, as Wayne Aspinall had envisioned, state delegations must agree to proposals involving their state's lands in order to proceed. One facet of wilderness politics in the twenty-first century remains similar to that of the 1950s and 1960s when the bill first appeared: there is widespread popular support for an issue that lacks saliency for most who have no economic stake in the outcome, versus well-organized, cohesive opposition from those who may be affected financially.

In a study detailing the politics involved in defeating the proposal for a wilderness designation for most of Grand Canyon National Park, researchers applied E. E. Schattschneider's classic model of political conflict in which scope, affected by visibility and socialization, is key to the outcome.[11] For Grand Canyon National Park, the authors contend that in the 1970s commercial outfitters, dependent on motorized transport in the Colorado River for their livelihood, effectively expanded the scope. The visibility of the river boaters' concerns ensued in the 1980s, especially with Senator Orrin Hatch and Interior Secretary James Watt championing their cause in a public way. Finally, enhanced socialization of conflict occurred as the proponents of continued commercial use of the river enlisted state and local government as players. Ultimately, the wilderness designation failed because proponents did not want to exclude the Colorado River corridor, nor grant exceptions for use of motorized transport on the river. The opponents of the designation successfully redefined the issue to include the public interest, rather than shape the decision solely as a conflict between business concerns and the Park Service. They successfully framed the issue as one of local control pitted against remote federal bureaucrats, with popular support favoring the former. The authors conclude "… it appears the major designating days are over in parks and other large expanses."[12]

In 1974, the Park Service recommended a wilderness designation for over ninety percent of acreage in Rocky Mountain National Park. They concluded that the building of roads or significant structures in the park would cease, and in some cases they would remove existing structures to allow the area to revert to a natural state. Curtis Buchholtz, in describing public response to the Park Service's recommendations, recounts mostly positive reactions. Yet the plan had its critics, with some believing this type of management restricted the use of the park for the vast majority of visitors who did not venture far from the roads.[13]

Since that time, the Park Service has administered Rocky Mountain National Park in a manner generally consistent with a wilderness designation without the official coverage of the 1964 act. Though bills have been proposed to apply the wilderness designation, none have been approved. The affected lands in Rocky Mountain National Park lie in both the 2nd and 4th Colorado Congressional districts. Implementation of a successful wilderness designation required the support of both districts' U.S. Representatives, as well as both of Colorado's U.S. Senators. In the 1990s, Republican Representative David Skaggs introduced unsuccessful designation bills in the 103rd, 104th, and 105th Congresses. Subsequently his successor, Mark Udall, introduced a bill in the 106th, 107th, and 108th Congresses, all without success.

In the 109th Congress, which included newly elected Democratic Senator Ken Salazar, the political landscape seemed to shift. Unlike his Republican predecessor, Ben Nighthorse Campbell, Salazar supported the designation bill. By the spring of 2006, the success of a Salazar-Udall wilderness designation bill seemed probable. But in October 2006, negotiations broke down between Senator Salazar and Colorado's other U.S. Senator, Republican Wayne Allard. Senator Allard and Republican Representative Marilyn Musgrave of the 4th Congressional district announced their alternative bill, allowing for wilderness in Rocky Mountain National Park, but not of the "big W" variety.

The Allard-Musgrave alternative bill sought to address what they saw as the need for flexibility regarding fighting wildfires and insect infestations, as well as the possible development of future water projects. Allard and Musgrave also wanted protection for the continued operation of the Water Supply and Storage Company's Grand Ditch.[14] Representative Udall pointed to provisions in the Wilderness Act that allow for roads and mechanization with regard to fire-fighting and insect infestation.[15] The Salazar-Udall bill excluded the Grand Ditch and a corresponding right-of-way from the designation. The ditch company seeks further protection by being released from liability should a problem with the ditch damage the surrounding land. The ditch company is currently fighting a federal lawsuit regarding damage caused to Rocky Mountain National Park in a 2003 flood.[16]

Was the story regarding Rocky Mountain National Park similar to the one in Grand Canyon? Are major designating days over for national parks? The authors of the Grand Canyon National Park study believe legislators have little incentive to expend political capital promoting wilderness; consistent with Schattschneider's model of political conflict, the opponents are likely to expand the conflict's scope by heightening its visibility and socializing it to their advantage.

Though nationwide the National Park Service administers more wilderness land than any other agency,[17] only a small portion of its wilderness in Colorado—less than three percent—is national park land. As the table of **Colorado Wilderness Designations** illustrates (see Appendix) the state has a history of offering wilderness designations under both Republican and Democratic legislators. The table shows the party affiliation of both U.S. Senators as well as party control in both houses of Congress. The largest designation occurred in 1980, coinciding with a huge national

addition to the National Wilderness Preservation System in the last year of the Carter administration. The last designation for national park holdings in Colorado took place under Republican Senator Hank Brown and then Democratic Senator Ben Nighthorse Campbell. The rate of designation nationally has been lower under the administration of George W. Bush than in any prior administration but even so, if the state Congressional delegation supports the designation, Congress will defer to its decision.

Rocky Mountain National Park, unlike Grand Canyon National Park, has no history of recreational commercial concerns that conflict with a wilderness designation. The park has never allowed commercial snowmobiling and the park's small ski resort closed in 1991. Furthermore, no river of a size adequate for commercial motorboats or even rafting runs through Rocky Mountain National Park. It is a smaller park than Grand Canyon National Park, with about 250,000 acres under consideration for the designation, compared to close to one million in the Arizona park.

Schattschneider's model of conflict indicates the scope widens through visibility and socialization promoted by the disadvantaged parties. The Rocky Mountain National Park conflict has never attracted national attention like that of Grand Canyon National Park. The height of visibility came in 2006 when Allard and Musgrave proposed their alternative bill. That visibility worked to the advantage of proponents of the Salazar-Udall bill. They were able to characterize the Allard-Musgrave bill as an attempt to protect narrow interests by keeping options open to exploit the park's natural resources beyond that which would have been allowed for a national park without the wilderness designation. Unlike the Grand Canyon case, in which Senator Hatch spoke of the threat to commercial river rafters as one of limiting public access to a beloved park, the opponents of Rocky Mountain National Park's designation did not successfully frame a story to define concerns about water and mining rights as a broad public interest.

The other element in widening the scope of conflict in Schattscheider's model is socialization, that is, bringing in additional players. Schattschneider likened it to a fistfight between two individuals in which the one who is losing is eager to engage onlookers in the fight. In the case of Rocky Mountain National Park, the proponents of the wilderness designation socialized the conflict to include local governments of and around the gateway towns of Estes Park on the east and Grand Lake on the west. Though a few localities had been on board for years, by 2006 all the affected city and county governments of these areas announced support for the designation, some even passing resolutions on the matter. Unlike the Grand Canyon case in which local governments promoted local control, the public interest of protecting a valuable tourist attraction, upon which so many nearby residents depended for their livelihood, became the compelling story of the proposed designation. Not only did more local public officials voice their support for the designation in 2006, the towns of Grand Lake and Estes Park, as well as Grand and Larimer Counties, passed resolutions in support of it.

It therefore seems the political will now exists to pass the bill. The divisiveness seemed to be neither primarily among users of the park, nor those who live around it, nor even commercial industries, but rather the politically divisive climate in Congress.

Mark Udall suggested Congresswoman Marilyn Musgrave was "playing politics" in her decision to withhold support from the Salazar-Udall bill; she was in the midst of an extremely close re-election campaign. Udall indicated she did not want Democrats to receive credit for the passage of a popular bill.[18]

As Senator Allard is not running for re-election in 2008, it is less likely he is "playing politics." But it also lessens the chances of his being dissuaded from promoting a bill that has been criticized by many as beholden to special commercial interests if he believes it to be the better bill. The proprietary feeling so many Coloradans have about "their" national park translates into widespread support for according it a higher level of protection.[19] The state's political climate is changing, evidenced by the Democrats' gaining a majority in the state legislature and a U.S. Senator in the 2004 election, and a governor and additional members of Congress in the 2006 election. That, coupled with the change of majority parties in both houses of Congress, bodes wells for all proposed wilderness bills.

It is possible the long delay in a designation that did not face heated opposition until 2006 is a product of faith in the protection given by the national park. If wilderness advocates have a limited amount of political capital, they may believe it is best to spend it protecting federal lands administered by the National Forest Service or the Bureau of Land Management where the protection level is not as great.[20] It may be helpful to wilderness proponents for Rocky Mountain National Park that the Allard-Musgrave bill contains a perceived threat to the park regarding mining because it allows opponents to frame the debate as one of protecting the park rather than merely making an administrative change. Throughout the west, defining the land as a resource in the form of a "natural heritage,"[21] rather than the traditional view of extractable resources, results in success for wilderness advocates. This seems to be what the promoters of Rocky Mountain National Park's wilderness have achieved.

Appendix

Colorado Wilderness Designations

Year	Acres Designated	NPS Acres	CO Senators	Congress House/Senate
1964	720,553		RR	DD
1975	723,424		DD	DD
1976	191,119	57,648	DD	DD
1978	158,737	2,917	DD	DD
1980	1,006,871		RD	DD
1984	23,492		RD	DR
1993	469,314	41,676	RD	DD
1999	17,700		RR	RR
2000	93,294		RR	RR
2002	14,000		RR	RR
TOTAL	**3,418,504**	**102,241**		

Acreage figures from ***http://www.wilderness.net****.*

SIR WALTER RALEGH,
Guiana, and the Conceptualization of the New World

Michael Lee

Despite the fact that his 1595 expedition to Guiana found no lost empire of gold, Sir Walter Ralegh nevertheless managed to solidify and perpetuate the European view of the New World as a treasure trove and an exotic new Eden. The 1596 publication of Ralegh's book, the *Discoverie of the Large, Rich and Bewtiful Empyre of Guiana, with a relation of the great and Golden Citie of Manoa (which the Spanyards call El Dorado) and of the Provinces of Emeria, Arromaia, Amapaia, and other Countries, with their rivers, adjoining* accomplished that fact. This essay will survey and analyze the *Discoverie's* influence on ensuing authors' artistic works, such as visual art and poetry. It will also analyze the *Discoverie's* impact on the cartography and travel literature of the region, tracing Ralegh's thoughts on Guiana, and by implication the New World, across more than a century of European thought.

Norman Lloyd Williams, a biographer of Ralegh, describes the great Elizabethan as a

> *captain rather than a general; political commentator rather than a politician; business-man efficient in short-term enterprise, inattentive in long; lover of projects which involved great distances; most fully himself when concerned with an absolute—virginity, truth, sovereignty, death—or a limited, clearly envisaged action; in impotence despairing, self-pitying, melodramatic…. Still the same man, but with a greater reputation.*[1]

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Ralegh was born at Budleigh Salerton, Devon, about 1554. Born into a family of modest means, but gentle nonetheless, he began his odyssey in France in 1569, where he fought as a volunteer with the Huguenots.[2] At the age of eighteen, he attended Oriel College, Oxford. From 1580 to 1581, he was engaged in a brutal campaign in Ireland.[3] Thus, Ralegh was quite devoted to confronting Catholicism on the field of battle, especially when it meant directly challenging its principal defender, Spain. For example, when 600 Italian troops with Spanish officers landed in Ireland in September 1580, Ralegh distinguished himself during the ensuing campaign. He participated in the slaughter of Fort Smerwick, where he had most of those 600 men put to the sword.[4] From the Emerald Isle's bloodied fields he soon caught the eye of Queen Elizabeth herself. The Queen knighted Ralegh in 1584; not long after, he was bedecked with titles. The very same year, the Queen granted Ralegh a patent to colonize the New World, which eventually led to the founding of the first English colony of Virginia. But the capricious Ralegh quickly abandoned Virginia for imperial designs in northern South America.[5]

It was probably the same year that Ralegh began examining the potential of the region between the Amazon and the Orinoco, better known as Guiana. Historian D.B. Quinn believes that, in all probability, it was Richard Hakluyt's book, the *Discourse of Western Planting* that ignited Ralegh's imagination. It was in Hakluyt's treatise, explains Quinn, where Ralegh would have learned of Spain's weakness in the region east of Cumana.[6] By 1586, Ralegh gained additional information about the area from one Captain Jacob Whiddon, who had captured a Spanish functionary by the name of Don Pedro Sarmiento de Gamboa. It was from Sarmiento, speculates Quinn, that Ralegh obtained knowledge of the search for El Dorado "somewhere in the vast area to the east of the Andes."[7] It is also likely that his early interest in Guiana stemmed from an absolute fear of the Spanish obtaining yet another large store of gold or silver. Ralegh wrote in the *Discoverie* that it was the gold of the Spaniard

> *that indaungereth and disturbeth all the nations of Europe, it purchaseth intelligence, creepeth into Councils, and setteth bound loyalty at libertie, in the greatest Monarchies of Europe. If the Spanish king can keepe us from forraine enterprizes, and from the impeachment of his trades, eyther by offer of invasion, or by besieging us in Britayne, Ireland, or else where, he hath then brought the worke of our perill in greate forwardnes.*[8]

It is likely that Spain's 1588 failed invasion of England solidified Ralegh's belief.

The hope of finding a second Incan empire was an obsession of many European explorers ever since 1530.[9] The European El Dorado myth centers on a "Golden One," a king or chief who annually is sprinkled with gold dust, then paddles to the center of an enormous lake, (variously called Manoa, Paytiti, Parima, or Rupununi), where he "deposits votive offerings of gold work." The myth claims that on the shores of this massive body of water lies a magnificent golden city, which scholars refer to as either El Dorado or Manoa.[10] The myth itself traveled around South America, eventually coming to rest in the Guiana Highlands.[11]

By 1592, Ralegh's star had greatly dimmed at Court. By marrying behind the Queen's back, he incurred her wrath and disdain.[12] Disgrace and exclusion finally forced Ralegh to act on the rumors of El Dorado, though little is known about when he actually started planning his 1595 voyage. What is certain is that in 1594 he dispatched Captain Jacob Whiddon to gain intelligence on Guiana. Letters concerning the search for El Dorado also came into Ralegh's possession through Captain George Popham.[13] Yet out of all of Ralegh's personal letters, only ten concern his 1595 voyage. The earliest letter, dated September 20, 1594, alludes only briefly to a venture in "India."[14] More interesting however, is how Ralegh referred to his Guiana enterprise as his "destiny."[15]

Ralegh set sail for his destiny on February 6, 1595; by March 22, he reached the island of Trinidad.[16] After capturing its governor, Don Anthonio de Berrio, and burning its capital, St. Joseph, he proceeded to amass much information from the governor and natives.[17] Berrio confirmed and expanded on Ralegh's knowledge of Guiana and the El Dorado myth. Incidentally, it was through Ralegh that Europe first learned of this obscure island governor's exploits. As V. T. Harlow points out, Berrio's own account laid untouched in the *Archivo de Indias* at Seville for three hundred years.[18] From Trinidad Ralegh proceeded into the interior of Guiana. During his month long trek, he passed only 250 miles inland into what is now eastern Venezuela,[19] and failed to find El Dorado or the grand lake Parima. Instead, he returned to England empty handed.[20]

Arriving home in September without treasure ships brimming with American gold and gems, Ralegh came bearing promises: assurances of vassalage from some of the chieftains that he had met and guarantees of a plan to ally England with the chimerical Incan empire of El Dorado. By November 10, Ralegh wrote to Sir Robert Cecil, a connection he had at Court, and melancholically wondered what "becumes of Guiana I miche desire to here, whether it pass for a history or a fable. I here Master Dudley and others ar sendinge thither."[21] A November 12 letter, again addressed to Cecil, assured his friend "that ther are not more diamonds in the Est Indies then are to be founde in Guiana." The letter also contains a stark, but familiar warning:

> *If the Spaniards had bynn so blockishe and slouthfull wee had not feared now their poure, who by their gold from thence vex and indanger all the estates of Europe. Wee must not looke to mayntyne war upon the revenues of Ingland: if wee be once driven to the defensive, far well my part, but as God will so it shalbe who governs the harts of kings.*[22]

Ralegh sent his last letter to Cecil near the end of November. In it, he seems to be despairing and melodramatic. However, for Ralegh time was of the essence. He had set up tentative alliances with chieftains, like Topiawari of Arromaia. Therefore, any delay could have dashed to pieces the only concrete achievement of the expedition.[23] "I beseech yow," he pleaded, "lett us know whether wee shalbe travelers or tinkers, conquerors or crounes [= imbeciles], for if winter pass without making provision ther can be no vitaling in the summer. And if it be now forslowed [= delayed] farewell Guiana forever."[24]

With all of Ralegh's private pleadings falling on deaf ears, his destiny going up in smoke, it appears that the 1596 publication of his expedition was a deliberate attempt to garner public and private support. As literary historian, Steven J. Greenblatt puts it:

> *The* Discoverie *was a calculated performance, a work of propaganda, sharing the aims of the hundreds of books and pamphlets on exploration that were turned out in the late sixteenth and seventeenth centuries to proclaim the great success of an expedition, invite subscriptions for subsequent voyages, attract adventurers and emigrants, and solicit government support.*[25]

No such support came. Instead, the *Discoverie* became an "Elizabethan 'best seller.'"[26] According to N.M. Penzer's analysis in Harlow's 1928 edition of the *Discoverie*, approximately four different editions appeared in 1596. Penzer based his conclusion upon the four existing copies, three in the British Library and one at Harvard.[27] The *Discoverie* was also included in Hakluyt's *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation* (1600).[28]

Domestic publication aside, the number of foreign editions of the *Discoverie* is the best gauge of its impact. It seems that the first foreign edition in Dutch appeared in 1598.[29] However, 1599 was truly the banner year for Ralegh's *Discoverie* on the Continent. Theodore de Bry and his family issued it as part of their magisterial work, *Historia Americae*, a brilliant attempt at illustrating the literature of American travel.[30] *Americae* also appeared subsequently in both German and French.[31] Levinus Hulsius simultaneously published both a Latin and a German edition. Based upon the holdings of the John Carter Brown Library, it appears that the Latin edition went through one printing and the German five, running from 1599 to 1663.[32] Out of all the foreign language editions, the Dutch had the longest run, finally ending in 1747. These eighteenth century reprints coincided with a renewed "commercial interest in the exploitation of gold mines in Guiana by the West India Company."[33]

Out of all the versions of the *Discoverie,* the most important were those released by Theodore de Bry and Levinus Hulsius. In addition to reproducing the text, both men included intricate engravings intending to illustrate what they thought—and by implication what their audiences thought—were the most pertinent events of Ralegh's expedition. In essence, de Bry and Hulsius created visual icons for the *Discoverie*. Visual representations of the New World were quite rare at the time,[34] and most were crude, often lacking any artistic flourish. Ramusio's *Navigationi e Viaggi* (1550-59) and Benzoni's *Historia del Mondo Nuovo* (1565) best demonstrate that deficiency.[35]

The engravings by de Bry and Hulsius were also able to reach the illiterate majority of European society. Many storefronts displayed frontispieces in their shops to attract customers. Peddlers and wandering vendors probably sold the frontispieces and illustrations at fairs.[36] Thus, the market for de Bry and Hulsius was vast and diverse.

This raises the question of message. The visual content embodied in de Bry's engravings is vastly different from that of Hulsius and his illustrations. Virtually all the editions of *Americae* included six plates. One plate, depicting a scene from Ralegh's initial entrance into the Orinoco is rare, appearing only in the 1625 Latin

edition,[37] its motif decidedly anti-Spanish. There is another plate entitled "How Sir Walter Raleigh conquers a city and takes as prisoner a Spanish Governor." Still another portrays natives clubbing to death Spanish soldiers in the foreground, while Spaniards are executing Morequito, a native chieftain, in the background.[38] This seems to be in keeping with the well-known sixteenth and seventeenth century Protestant tradition of demonizing the Spanish, and by implication Catholicism. This theme also keeps with the text of the *Discoverie* itself, which is highly anti-Spanish.[39]

More important to this discussion, however, is the way de Bry depicted Guiana itself. Did he portray it as a treasure trove, an exotic new Eden; or as a green hell populated by cannibalistic savages? One plate entitled, "How Guianan noblemen would dress in gold" is a perfect example of the *Discoverie's* impact on the European psyche.[40] The engraving itself is an amalgamation of two descriptions. The story told in the background derives from Ralegh's account of a feast he saw at the town of Arowacai.[41] The story in the foreground concerns the "Golden One" and his servants being painted with a white balsam, "and certaine servants of the Emperor having prepared gold made into fine powder blow it thorow hollow canes upon their naked bodies, until they be al shining from the foote to the head."[42] De Bry emphasized the golden nature of Guiana further by the illustration titled, "How the Guianans used to make gold castings." His description of the plate reads,

> *The inhabitants of the country of Guiana often used to mould their images and plate from gold grains, sometimes as big as small stones.… This is how it was used: the gold was mixed with a little copper to make it smoother and put in a large container. This container had little holes all the round the bottom and in them, on one side, small tubes were placed. On the other side forms were placed and that part was put to the fire to heat up. Then they blew through the tubes to increase the fire until the gold melted and ran into the forms of stone or clay.*[43]

Along with illustrating that Guiana was golden, de Bry also depicted the more exotic customs of its peoples, thus the illustration, "Their ceremonies for the dead."[44] Again, two stories are told in one plate. The first shows how the Macuri and Capuri lament the death of their commanders "and when they thinke the flesh of their bodies is putrified, and fallen from the bones, then they take up the carcase againe, and hang it in the *Casiquies* [= Lord's] house that died, and decke his skull with feathers of all colours, and hang all his gold plates about the bones of his arms, thighs, and legs."[45] Although Ralegh does not mention human cannibalism, de Bry implies it; he depicts the natives as naked, depriving them of clothing, a key European notion of civilization.

With de Bry's emphasis on gold and exotic customs comes the mimetic depiction of Ralegh's Edenic notion of Guiana. An untitled plate from the 1625 Latin edition matches perfectly with Ralegh's description.[46] The plate seems to depict English meadows, parks, and forests flowing into Guianan jungle. Out of this confluence comes a biblical scene of paradise, where as in the original, serpents lurk to devour those who are unready. Perhaps the only element missing is a pastoral shepherd to tend to the deer.

This plate is perhaps the best example in de Bry's series of Edenic idealism, but the other plates mentioned above, save maybe one, contain similar elements, i.e., groves of trees seemingly placed by God.

De Bry ignores the more fanciful descriptions in the *Discoverie*. There are no illustrations of Ralegh's Amazons or Ewaipanoma, who "have their eyes in their shoulders, and their mouths in the middle of their breasts, & that a long train of haire groweth backward between their shoulders."[47] Ralegh never says in the *Discoverie* that he saw those fantastic beings; like El Dorado, they are merely secondhand observations from other explorers or natives.

Levinus Hulsius's version of the *Discoverie* seems to buy into the existence of those creatures. Hulsius, like de Bry, was interested in selling books, but he added a level of authenticity to the creatures in his engravings that not even de Bry thought to undertake. In his *Brevis & admiranda descriptio Regni Guianae* a *Tabula Locorum*, Hulsius included a table indicating the exact longitudinal and latitudinal directions to such places as golden Manoa, the Ewaipanoma, and the Amazons. Such widely known locations as the Amazon, Orinoco, and Essequibo rivers also appear in the table.[48] Thus he affords the physical existence of the Amazon River as much credence as the Ewaipanoma. Hulsius's educated audience would have picked up on this important fact. It is apparent that what may seem fanciful to one author may be perfectly believable to another.

Hulsius included five illustrations with his *Brevis & admiranda descriptio Regni Guianae*. Thematically, the Amazons play a large role in his work, although their description occupies little more than a page in the 1596 edition.[49] Of the five plates, two are of their activities; the most interesting consists of a Dionysian orgy.[50] This scene is derived from a passage in the *Discoverie* where Amazons

> *do accompanie with men but once a yeere, and for the time of one moneth, which I gather by their relation to be Aprill. At that time all the Kings of the borders assemble, and the Queens of the Amazones, and after the Queenes have chosen, the rest cast lots for their Valentines. This one moneth, they feast, daunce, & drinke of their wines in abundance, & the Moone being done, they all depart to their own provinces.*[51]

The antithesis of the sexually free Amazon is the aggressive she-warrior, who is "cruel and bloodthirsty, especially to such as offer to invade their territories."[52] This was an oblique reference to Elizabeth herself, the Amazon *par excellence*. However, to Hulsius's male audience these two illustrations would probably have aroused conflicting feelings of both titillation and deep-seated fear, for European society was highly patriarchal.

Hulsius engraved Ralegh's headless Ewaipanoma into existence.[53] The plate itself displays two such creatures in the foreground and two in the background. The two in the foreground are standing contrapposto and look just as Ralegh's *Discoverie* describes them. The two in the background are engaged in hunting what appears to be an armadillo. The idea of headless men was not new to the European mind; legendary medieval traveler, John Mandeville popularized the myth in the fourteenth century. What makes

Hulsius's illustration so fascinating are the longitudinal and latitudinal directions. If not for the *Tabula Locorum*, the Ewaipanoma engraving would be able to be written off as a shameful attempt at attracting customers. Hence, a medieval monstrosity is seemingly confirmed to exist through both geographic plotting and visual representation.

It appears that Hulsius was the first to illustrate for Europeans the golden city of Manoa.[54] The chimerical city, situated on the shores of the great Lake Parima, seem to be one part Istanbul mixed with two parts Nuremburg. Plying the 200-league long lake, which according to Ralegh was "like unto *mare caspium*," are European ships fully equipped with sails,[55] ironic since the *Discoverie* never mentions European ships sailing on Lake Parima. Artistic license aside, the truly monumental aspect of the illustration is that it gives the impression that El Dorado was found and concrete. To a Renaissance audience this must have been perfectly believable. The conquests of Cortez and Pizarro earlier in the sixteenth century had laid the groundwork for a very credulous public. Thus, Ralegh's *Discoverie* appears to have enchanted Hulsius, and through Hulsius's work, all of Europe.

Because of the labors of de Bry and Hulsius, the *Discoverie* became a visual reality. Almost unbelievable natives and rituals became existent. Even the elusive city of gold grew into a reality. Through the copperplate engravings of Hulsius and de Bry Ralegh's beautiful empire of Guiana became populated with an incredible assortment of denizens; Amazons and Ewaipanoma now inhabited the hinterlands of the empire; servants of the Incan emperor ritualistically anointed him with powdered gold. Hulsius and de Bry translated fantastic verbal descriptions into an elegant and powerful Renaissance visual vocabulary.

In the year 1596, El Dorado entered the English lexicon,[56] fashioned into a solid literary conception from a shape-shifting traveler's tale. For many poets, Ralegh's Guiana became synonymous with earthly paradise; a golden land that was still virgin, a land of verdant pastures and splendid fertility, and, most importantly, a land of new beginnings where England could spread her colonial wings.

John Milton's magisterial epic *Paradise Lost* (1667) appears to draw much from Ralegh's *Discoverie*. Behind his description of Eden seems to be "the remembered tapestry of Ralegh's pictures of the kindly plains of Guiana."[57] As "woods, prickles, bushes, and thornes" surround Ralegh's paradisial Guiana, so do they encompass Milton's goodly garden.[58]

> *So on he fares, and to the border comes*
> *Of Eden, where delicious Paradise,*
> *Now nearer, crowns with her enclosure green,*
> *As with a rural mound the champaign head*
> *Of a steep wilderness, whose hairy sides*
> *With thicket overgrown, grotesque and wild,*
> *Access denied; and overhead up grew*
> *Insuperable highth of loftiest shade,*
> *Cedar, and pine, and fir, and branching palm,*
> *A sylvan scene, and as the ranks ascend*
> *Shade above shade, a woody theatre*
> *Of stateliest view.*[59]

Milton's "pure now purer air" of Eden seems to be an echo of the exceedingly fresh "ayre" of Guiana.[60] One can also draw a connection between Ralegh's observation of a valley near the Caroli River and Milton's description of Paradise. Ralegh wrote:

> *I was well perswaded from thence to have returned, being a very ill footeman, but the rest were all so desirous to go neere the said straunge thunder of waters, as they drew mee on by little and little, till we came into the next valley, where we might better discern the same. I never saw a more beawtifull countrey, nor more lively prospects, hils so raised heere and there over the vallies, the river winding into divers braunches, the plains adjoyning without bush or stubble, all faire greene grasse, the ground of hard sand easy to march on, eyther for horse or foote, the deare crossing in every path.*[61]

Milton's creation read:

> *Upon the rapid current, which through veins*
> *Of porous earth with kindly thirst up drawn,*
> *Rose a fresh fountain, and with many a rill*
> *Watered the garden; thence united fell*
> *Down the steep glade, and met the nether flood,*
> *Which from his darksome passage now appears,*
> *And now divided into four main streams,*
> *Runs diverse, wand'ring many a famous realm*
> *And country whereof here needs no account,*
> *But rather to tell how, if art could tell,*
> *How from that sapphire fount the crispèd brooks,*
> *Rolling on orient pearl and sand of gold,*
> *With mazy error under pendant shades*
> *Ran nectar, visiting each plant, and fed*
> *Flow'rs worthy of Paradise which not nice art*
> *In beds and curious knots, but nature boon*
> *Poured forth profuse on hill and dale and plain,*
> *Both where the morning sun first warmly smote*
> *The open field, and where the unpierced shade*
> *Embrowned the noontide bow'rs.*[62]

The Milton passage also seems to draw upon Ralegh's pastoralized description of his entrance into the Orinoco, i.e., the river of the *Lagartos* section previously quoted.

In a final textual comparison, the link is uncannily direct. Through it, one can see just how closely and lovingly Milton must have read the words of the *Discoverie*. Ralegh,

> *Guiana, and of that great and Golden City, which the Spanyards call El Dorado, and the naturals Manoa, which Citie was conquered, reedified, and inlarged by a younger sonne of Guainacapa Emperor of Peru, at such*

time as Francisco Pazaro and others conquered the saide Empire, from his two elder brethren Guascar, and Atabalipa, both then contending for the same, the one being favoured by the Oreiones of Cuzco, the other by the people of Caximalca.[63]

Milton,

Rich Mexico the seat of Motezume,
And Cusco in Peru, the richer seat
Of Atabalipa, and yet unspoiled
Guiana, whose great city Geryson's sons
Call El Dorado.[64]

As the British Empire was still but a glimmer in the colonial eye, the *Discoverie* inspired such poets as George Chapman and John Donne to some of their most stirring and patriotic poetry. Chapman's *De Guiana, Carmen Epicum* is amongst the most jingoistic:

Riches, and Conquest, and Renowme I sing,
Riches with honour, Conquest without bloud,
Enough to seat the Monarchie of earth,
Like to Ioues Eagle, on Elizas hand.
Guiana, whose rich feet are mines of golde,
Whose forehead knocks against the roof of Starres.[65]

De Guiana is laden with the imagery of rape. Its urging of conquest in more than one sense is akin to that of the *Discoverie*. In fact, later on in the poem Chapman refers to Ralegh as "Th'industrious Knight, the soule of this exploit."[66] More important, however, is Chapman's imagery of empire, which draws much from Ralegh's thoughts.[67] It comes into its fullest bloom at the end when the very world "kneeles" to mother "Britania."[68]

Donne's epigram, *Cales and Guyana*, is understated in its call for empire. Furthermore, given the epigrammatical structure of the poem, Donne had to be concise with his message. It reads,

If you from spoyle of th'old worlds farthest end
To the new world your kindled valors bend,
What brave examples then do prove it trew
That one things end doth still beginne a new.[69]

"Cales" is Cadiz in the southwest of Spain, a point even farther west than Gibraltar. The "you" in the poem could possibly be Ralegh, but could just as easily be a reference to England as a whole.[70] Thus, Guiana was the beginning of the New World for the Elizabethan mind, a place where the English could bend their valor and engage in acts of bravery, i.e., conquest.

The *Discoverie* reached a poetic apotheosis through the work of Milton, Chapman, and Donne. Prose grew into poetry; Guiana, in many ways, developed into a template for Eden. In the thoughts of many, empire became synonymous with Guiana, even though it was not a physical reality. Metaphorically unspoiled and golden, Guiana became the figurehead for the English conception of America in the late sixteenth and early seventeenth centuries.

Ralegh literally put Guiana on the map. Before the publication of the *Discoverie,* there were no printed maps of the region.[71] A quote from Ralegh's contemporary, Richard Willes, illustrates the power and importance of geography to Elizabethans:

> *Who but Geographers doe teach us what partes of the earth be cold, warm or temperate? Of whom doe we learn howe to divide the world into partes, the partes into provinces, the provinces into shyres? of Geographers. Unto whom have wee to make recourse for the Mappes, Globes, tables and Cardes, wherein the dyvers countreys of the World are set downe? unto Geographers.*[72]

Geography meant power, the ability to claim; the *Discoverie* was Ralegh's "major attempt at descriptive or regional geography."[73] From Ralegh's detailed imagery sprang the more than two-hundred year cartographic practice of plotting El Dorado and Lake Parima on maps.

Low County engraver Jodocus Hondius was the first to make Guiana a published cartographic reality in 1599, though some degree of controversy swirls around his exact sources. J.A. J. de Villiers proposes that Hondius based his map strictly on the narrative of the *Discoverie*.[74] R.A. Skelton argues that Hondius obtained a copy of a map from Ralegh's voyage. Skelton draws his analysis from a letter, which states that a seaman was selling charts of Guiana at the time. Furthermore, Skelton points out that the title of a de Bry map, based on that of the Hondius, credits a seaman for its origins.[75] Villiers, on the other hand, points out that Ralegh's "name appears in many of the notes that are spread" over the Hondius specimen.[76] Both Skelton and Villiers make compelling arguments, but the later appears more grounded. First, Skelton provides no documentary evidence that Hondius ever came into possession of such a map. Second, Skelton only cites that the sailor story is on the title of the de Bry and not on that of the Hondius. Third, the *Discoverie* itself was in wide publication by 1599, and easily available. Finally, the sailor story may have been added to the de Bry version's title to increase its salability.

Ralegh was responsible for filling in the vast *terra incognita* of northern South America. An examination of Hondius's map reveals just how powerful the *Discoverie* was in shaping the geography of the region.[77] Lake Parima is the map's most prominent feature. Positioned on the equator, it is 200 leagues long, just as the *Discoverie* describes it; the great golden city of Manoa (El Dorado) situated on its shore. Prominently displayed are the Ewaipanoma and the Amazons, their domains north and south of Lake Parima respectively. In the lower left hand corner, Hondius strategically places a cartouche where nothing is known. Sprinkled over the chart are the places Ralegh visited: Arromaia, Morequito, Toparimaca's village, and various others. Also present is

a representation of a stag, like the deer Ralegh mentions so frequently. Even Ralegh's tortoises and armadillos enjoy prominent places on Hondius's plot.[78]

Given the region's inaccessibility, it is not surprising that other cartographers adopted Ralegh's observations. Willem Blaeau, prince of the seventeenth century cartographers, included Lake Parima and El Dorado on his own map, as did Jan Janssen in 1647. Yet, by the middle of the eighteenth century, Lake Parima and Manoa were almost obliterated when cartographer d'Anville, opted to omit the imaginary lake from his map of South America, which he published in 1748. By 1760, under great public pressure, he resurrected the make-believe body of water. It was not until the nineteenth century that geographers permanently expunged Lake Parima and Manoa from the maps of the region.[79]

Because of the *Discoverie*, all of Europe became geographically familiar with Guiana. Hondius's map added a new dimension of cartographic reality. Individuals could not only physically point to where Guiana was, but also to where the Amazons and Ewaipanoma lived. Ralegh's lost Incan empire became as real as the one Francisco Pizarro had discovered and conquered. It did not matter that not a single soul had actually seen the lake and its golden city—all that mattered was the idea, the image of Guiana being a bountiful paradise full of wonder and splendor. Ralegh's concept of Guiana became more believable than the physical reality; it evolved into Guiana's cartographic identity. Before setting his vision to paper, northern South America did not exist in the Northern European consciousness; it was merely part of South America, but not characteristically different from the rest of it.

Travel descriptions accompanied a large number of seventeenth century maps of Guiana. Perhaps the most interesting of them come from the Mercator-Hondius-Janssonius *Atlas* (1636), John Ogilby's *America* (1671), Alain Manesson Mallet's *Description de l'univers* (1683), and Robert Morden's pocket atlas *Geography Rectified* (1693); all borrow liberally from the *Discoverie* for their description of the land. In some instances, they directly refer to Ralegh in the body of the account; in others, there are whisperings and indirect shouts. What is clear is the power Ralegh's narrative held over the area. For example, all four sources make references concerning El Dorado and Lake Parima, and emphasize the Edenic nature and abundance of the land.

Ogilby's *America* is typical of the *Discoverie* inspired descriptions. It describes Guiana as a country that "yet enjoyeth a temperate and good Air, not oppressed with any excessive Heat."[80] In addition, Robert Morden's *Geography Rectified* is similar in its message of Guiana being a new paradise:

> *The people of Guyana live long, by reason of the good Air, which they breath. Their Country lies in the middle of the Torrid Zone, but the Eastern Winds are very constant. The Days and Nights are equal, the later being very cool, the dews falling in great abundance. The Mountains are high, and the Forests very thick, so that it is never excessive hot, nor excessive cold. The soil is very proper for the Tillage of Manioc; others for the planting of Cotton; others for sugar and Tobacco; others that yield Gums, Wood, Stones of divers sorts, Parrots and Monkeys. Besides that Hunting and Fishing are equally profitable and delightful.*[81]

The Mercator-Hondius-Janssonius *Atlas* is the earliest example and is more restrained with its description of the nature and quality of the land. Nevertheless, taken as a whole, it too promulgates Ralegh's vision of Guiana as a land "of many fine Rivers… and fruitful soil.[82] Alain Manesson Mallet's textbook, *Description de l'univers* follows the same pattern. It describes Guiana as a land with "cooling winds and a healthful climate," where "rivers are everywhere." The requisite fertile soil that produces an abundance of crops is also present in Mallet's description.[83] Thematically the message is the same in all of the selections: that Guiana is a New World Eden ripe for colonization. In this critical aspect, they do not differ from the *Discoverie*.

It appears that none of the above geographers ever visited Guiana, but they described it was as though they had. It is widely recognized that the travel writers of the seventeenth century pirated other authors' material.[84] In this case, Ogilby and Morden seem to be the most obvious, deriving their descriptions from several identifiable places in the *Discoverie*.[85] In fact, they mention Ralegh by name.[86] The two non-Anglo sources also seem to take their cues from Ralegh when it comes to the land's nature and quality.[87]

El Dorado and Lake Parima play a large role in the aforementioned descriptions, namely because they are integral to the narrative structure of the *Discoverie* itself. In essence, each of these narratives is a miniature version of the *Discoverie*, adopting its key themes of gold, abundance, virginity, and overall healthfulness. El Dorado and Lake Parima are the crown jewels of all the travel descriptions, which nearly always mention them at or near the end, as to leave the reader wanting more.[88] Furthermore, the El Dorado myth as set down by Ralegh was what all four sources based their accounts on; the Mercator *Atlas* copies the *Discoverie* word for word.[89]

Sir Walter Ralegh solidified and perpetuated the European view of the New World as a treasure trove and exotic new Eden through his paradisial travel narrative the *Discoverie*, this despite the fact that the expedition itself was a bona fide failure, little more than a trek in the well trodden foot prints of the Spanish. More importantly, he defined the entire character of the region, developing several themes, which became tropes for describing the area. Furthermore, at least for the late sixteenth and early seventeenth centuries in England, Guiana became a symbolic stand-in for an entire hemisphere.

However, there was a great disconnect between literary discourse and practical policy, for it was not the seventeenth century English who proceeded to colonize Guiana. The Dutch heeded Ralegh's colonial battle cry in 1616 by founding the colony of Essequibo. To its east, the Dutch West India Company established the settlement of Berbice in 1628. During the course of the eighteenth century, Dutch expansion in the area led to the creation of the province of Demerara.[90] Lack of English interest in the region likely stemmed from Elizabeth's view of Ralegh as *persona non grata*. Her loathing of him was transferred to her successor, James I, who had him executed in 1618 on trumped up charges of treason.[91] Furthermore, the success of the North American colonies for the duration of the seventeenth century likely served as a siphon for monies and emigrants. Consequently, lacking significant private or public backing, Ralegh's conception of an English empire on the Spanish Main went up in smoke.

Ralegh's idea of an English domain in northern South America was resurrected on a smaller scale in the nineteenth century. Great Britain's seizure of Demerara, Essequibo, and Berbice in 1803 led to the eventual establishment of the colony of British Guiana in 1831.[92] Ralegh's *Discoverie* became so engrained in the minds of the Victorians that individuals published books with titles like, *El Dorado or, British Guiana as a field for Colonisation* (1866).[93] Thus, Ralegh and his grand design went through a renaissance during the Victorian era, and the true nature of Guiana as a malarial ridden swamp was utterly consumed by his dream of paradise and empire.

ENDNOTES

PROGRESS IN A CAN:
An Examination of One Industry Through the Gilded Age and Progressive Era

Jacqui Ainlay-Conley

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FROM TINKERERS TO GODS:
The Electric Guitar and the Social Construction of Gender

Monique Bourdage

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SOVIET FAITH IN TECHNOLOGY:

Soviet Ideology and its Practical Application in the 1920s–1930s

Nicholas Coombs

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SWEETS TO THE SUITES?—
The Preservation Challenges of an Abandoned Sugar Beet Factory

Debra Faulkner

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31. Rachel Carter, "'Our Way' or 'The City's Way,'" *Reporter-Herald,* November 15, 2004, 1-A.
32. Rachel Carter, "Sugar Deal Sours," *Loveland Reporter-Herald,* November 19, 2004, 1-A.
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36. Colorado Sweet Gold web site, available at http://coloradosweetgold.com/history.htm.
37. Cindy Harns, Director, Windsor Museum, telephone interview by the author, 6 April, 2006.
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THE POLITICS OF WILDERNESS DESIGNATIONS:
Controversies Concerning Rocky Mountain National Park

Jean Kingston

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2. *The Wilderness Institute* at http://www.wilderness.net reports the percentage of total Wilderness acres for the top states as follows: Alaska – 53.78%; California – 13.43%; Arizona – 4.24%; Washington – 4.04%; Idaho – 3.75%; Montana – 3.22%; Colorado – 3.18%.
3. In the 85th Congress Aspinall was acting Chair because the nominal Chair, California Representative Clair Engle, while running for U.S. Senate, delegated the position to Aspinall, the next most senior Democrat on the committee.
4. See http:www.blm.gov/nhp/300/wo320/MiningClaims.pdf. The laws regarding mining claims on federal lands are complex, involving both state and federal statutes and court decisions. According to the Bureau of Land Management, which administers mining claims on BLM land as well as National Forest land, nineteen states (including Colorado) currently allow for mining claims in which the land may be purchase if a "prudent man" would accede that because of a visible vein of a valuable mineral, the land is more valuable for mining than for agriculture. The claimant must maintain the site and pay yearly fees.
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19. C. W. Buchholtz, Classroom lecture, University of Colorado at Denver, November 14, 2006. This retired park ranger and respected authority on RMNP spoke of this common sentiment found among those who may visit the park regularly or rarely. Either way, to them the park is a monument, unchanging in a world of transient landscapes.
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SIR WALTER RALEGH,
Guiana, and the Conceptualization of the New World

Michael Lee

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2. Willians, 21.
3. Williams, 23, 38.
4. John Winton, *Sir Walter Ralegh* (New York: McCann & Geoghegan, 1975) 27, 28.
5. Williams, 69, 73.
6. D.B. Quinn, *Raleigh and the British Empire*, (London: The English Universities Press, 1947), 164.
7. Quinn, 165, 166.
8. Sir Walter Ralegh, *Discoverie of the Large, Rich and Bewtiful Empyre of Guiana, with a relation of the great and Golden Citie of Manoa (which the Spanyards call El Dorado) and of the Provinces of Emeria, Arromaia, Amapaia, and other Countries, with their rivers, adjoining*, ed. Neil L. Whitehead (Norman: University of Oklahoma Press, 1997), 127-128.
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19. Whitehead, ed. *Discoverie*, 135n.
20. Quinn, 195.
21. To Sir Robert Cecil. From Sherborne, 10 November 1595, in *The Letters of Sir Walter Ralegh*, eds. Agnes Latham and Joyce Youings (Exeter: Exeter University Press, 1999), 125.
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33. Whitehead, "The *Discoverie* as enchanted text," 10-11.
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38. De Bry, 170, 171. The translations for the captions and descriptions of the plates are by Michael Alexander the editor, who used the German edition of *Americae*.
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41. Ralegh, *Discoverie*, ed. Whitehead, 167-168.
42. Ralegh, *Discoverie*, ed. Whitehead, 141.
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53. Hulsius, n.p.
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58. Ralegh, *Discoverie*, ed. Whitehead, 163.

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74. Villiers, "Famous Maps," 181.
75. Skelton, 140, 141.
76. Villiers, "Famous Maps," 181.
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86. Ogilby, 609; Morden, 560.
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88. Mercator, 452; Morden, 561; Ogilby, 619; Mallet 350.
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PROGRESS IN A CAN:
An Examination of One Industry Through the Gilded Age and Progressive Era

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The Electric Guitar and the Social Construction of Gender

Monique Bourdage

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SWEETS TO THE SUITES?—

The Preservation Challenges of an Abandoned Sugar Beet Factory

Debra Faulkner

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Jean Kingston

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Guiana, and the Conceptualization of the New World

Michael Lee

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