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Editor's Note

Last issue, I mentioned how I was interested in incorporating modern photography wherever possible to help bring stories into a more direct perspective. Period photography is necessary and should be part of the telling of any story but I have always lamented the abstract, distancing quality that grainy, faded old photos have. They tend to at least partially obscure the fact that these were real people and events. History happens in color but is often told in halftones, so something is inevitably lost in translation.

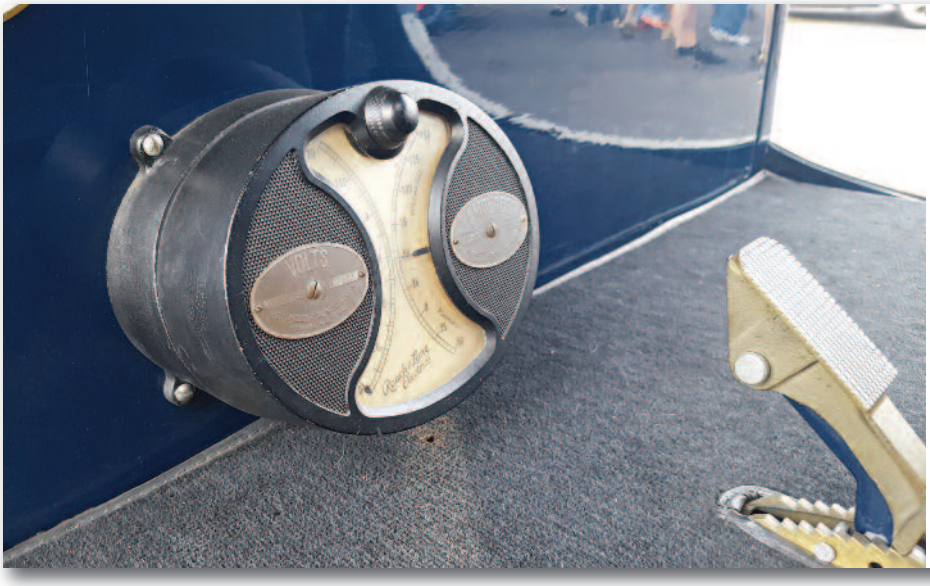
Featured in issue #57 was *Bob Ebert's* extensively-researched history of the Rauch & Lang electric car company. It was a fascinating read that put into perspective the battle between competing forms of power for early automobiles.

One would have to imagine my surprise to actually come into contact with a genuine 1912 Rauch & Lang Victoria just a few miles from our new home in Florida. My fiancée, Ann, and I decided to meet some friends early on the morning of April 15th at a "Cars and Coffee" meeting at the DuPont Registry building in St. Petersburg. Still a bit groggy after a cup of French Roast, I immediately perked up at the sight of what was obviously an electric vehicle. Upon looking the car and its showboard over, I found out that it was indeed a Rauch & Lang. It was in perfect condition and it was still in the family of the original owner!

I had the pleasure of speaking with Mr. Alexander Johnston Williams, of Clearwater Beach, Florida. He is the owner of this electric masterpiece and he had quite a story to tell.

The car was originally ordered by his great-grandfather, Alexander Johnston, who was a prominent

continued on page 46



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Front Cover: The electric-powered 1912 Rauch & Lang Victoria owned by Alexander Johnston Williams. Photo by Don Keefe.

Back cover: A vintage countertop display for Boyce Motometers. Photo by Francis G. Clax.

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Firm Competetiveness and Postwar Economic Integration in Europe:

The Case of Volkswagen in the ECSC and EEC

By Grace A. Ballor

Photography and ads from the author's private collection unless otherwise noted

Abstract

By many accounts, Volkswagen, whose history as an auto manufacturer began under Adolf Hitler, became so successful in the postwar period that it undergirded the

German economic miracle. But how did Hitler's car become the peoples' car for all of Europe? This paper argues that Volkswagen's survival and subsequent success were made possible by early post-war integration, namely by the institutions of the European Coal and Steel Community (1951), which first united six core member states and managed key resources for all of them, and the European Economic Community (1957), which created a common market for those member states and formed the foundation of the European Union as we know it today. By analyzing Volkswagen's company history, relationship with the ECSC and EEC and the company's production and sales data from the 1950s and 1960s, this paper argues that even with its efficient business model, Volkswagen could not have overcome the stigma of Germany's war guilt or the fact that the "Beetle" had been a major Nazi propaganda piece during the war if it were not for these institutions. Without institutional regulation and moderated access to both resources and consumer markets in Western Europe, Volkswagen could not have transformed "Hitler's car" into the vehicle of choice for the burgeoning middle class in postwar Europe, nor could it have become itself a force for European integration.

Introduction

Despite considerable losses in the Second World War and Allied attempts both to exact war reparations and to preserve peace in Europe, Germany quickly became Europe's dominant economic power in the immediate postwar period and has remained such ever since. The core of its post-war economic success, which is often hailed as the "German economic miracle," was West Germany's robust exportation of manufactured goods, especially automobiles.[1]

Simultaneous to the rise of the German economy was the momentous project of economic integration in Europe, beginning with the creation of the European Coal and Steel Community by the Treaty of Paris in 1951 and the establishment of the European Economic Community by the Treaty of Rome in 1957. Both the ECSC and EEC restructured the economies of Western Europe and worked to create a common market for certain goods.

While published scholarship on German economic success in the twentieth century tends to focus on the country's "liberal economic policies," few have considered the relationship between postwar industry and postwar institutions.[2] When making the case for the German postwar economic boom, or the *Wirtschaftswunder*, scholars often focus on the infrastructure laid by Hitler's war machine and on the socio-political re-landscaping of Germany in the 1940s.[3]

As a result, they forget the strong continuity between pre-war, wartime, and post-war institutions and the extent to which the West German economy required the protection of the regional common market systems established in the early stages of postwar economic integration. This myth of postwar German economic success as a product of German liberalism distorts the truth of economic history.

Perhaps the best counter-argument to the claim that postwar German liberalism produced the Wirtschaftswunder is the example of German automobile manufacturer Volkswagen, the leading firm in postwar Germany and largest producer of cars in Europe from 1960 to today.[4]

Founded by Adolf Hiter's Nazi Labor Front in 1937, Volkswagen continued to operate well into the 1950s according to Hitler's original plan to mass-produce a single model of a low-cost vehicle, the Volkswagen "Beetle." Even with its efficient business model, because of Germany's war guilt, the decimated domestic economy in postwar West Germany, and the fact that the "Beetle" had been a major Nazi propaganda piece during the war, Volkswagen owed its survival and especially its success in the 1950s and 1960s to the regulated common markets created by the ECSC and EEC. Without such institutional protection and without access to consumer markets in other Western European countries, Volkswagen could not have transformed "Hitler's car" into the vehicle of choice for the burgeoning middle class in postwar Europe.

The case of Volkswagen, more than any other West German firm, presents the opportunity to consid-

Figure 1: Hitler with his cabinet members and Ferdinand Porsche at a design meeting in 1934, discussing the Type 32 prototype. Dr. Porsche is at the far left with his arm outstretched.

er German economic ascendancy in the postwar period from all angles: the totalitarian legacy of Nazi labor, production and consumption programs, the influence of postwar Allied Occupation, the shift in perception of Western Germany and its exports, the revitalization of the domestic economy of West Germany, the distributional structure of steel resources in the ECSC, and most importantly the effect of the creation of a common market on the competitiveness of West German firms. This paper examines the effect of postwar economic integration in Europe, which facilitated the rise of the German economy, the health of West German business, and the particular success of the Volkswagen firm. Such a study must necessarily employ the methodologies of both Economics and History, since neither approach can adequately address the complexities of the postwar economic situation. Moreover, such a study must probe deeper than a simple aggregate analysis of firm data in the postwar period.

Thus, this paper proposes a new multi-disciplinary methodology, which attempts to answer macroeconomic policy questions using microeconomic policy analysis. By analyzing the competitive index of the single Volkswagen firm, this paper aims to provide new insight into the effect of postwar economic integration on business competition.[5] While it is true that Volkswagen's history and success are extraordinary, its place within German heavy industry and the postwar production economy at large enables this analysis of VW to resonate with a huge majority of its contemporary West German firms.

I. Hitler, "Father of Volkswagen"

As his party ascended to power in Germany in the early 1930s, Adolf Hitler began to develop his comprehensive political platform. In addition to his hope for German territorial expansion throughout Europe and for German primacy, Hitler envisioned a German economy as robust in consumption as it was in production. Perhaps more than any other consumable good, the automobile was for Hitler a

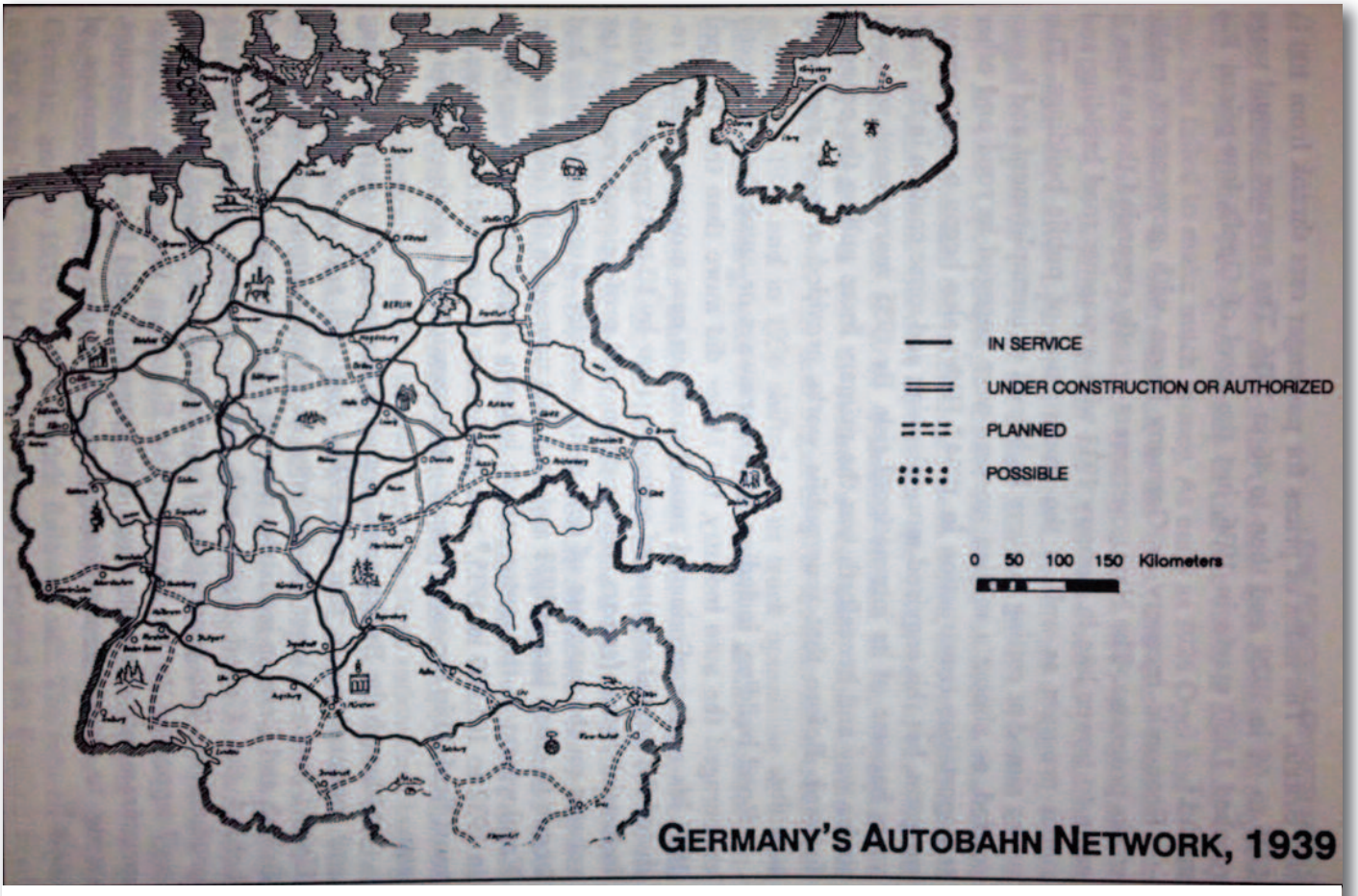

Figure 2: A map of Germany's Autobahn network, 1939.

symbol of strength, freedom, and power.[6] According to Wolfgang Konig, German political and economic historian, "For Hitler, the number of cars and miles of road were a measure of one's nation's cultural standards. His personal advisor, the Daimler-Benz manager Jakob Werlin, called the 'idea of motorization the symbol of national socialist revolutionary development.'"[7]

Because Germany lagged far behind her European neighbors in the 1930s race for cars per capita, Hitler resolved to invest tremendous energy into automobile production and to regulatory measures to ensure the availability of cars for every German family. The German economy had been severely weakened, however, by the First World War, war reparations, and the Depression of the early 1930s, necessitating major state intervention to capitalize the production of low-cost vehicles.[8] Not only did Hitler's Volkswagen campaign satisfy his eagerness to augment German middle class consumption, but it also provided the Nazi Labor Front with yet another political tool: a way to legitimize the Nazi promise to revive the German economy by solving the unemployment problem.[9]

A secret admirer of Henry Ford, Hitler began to make tandem appeals to German auto manufacturers such as Opel and even Daimler-Benz to mass produce a car that could sell for less than 1,000 RM, or a nine-month salary for the average working wage.[10]

At the same time, Hitler capitalized on the opportunity to present his automobile campaign as a compelling propaganda piece, promising to mobilize the nation on "four wheels, rather than two," since the economic pressures of the previous decade had limited the German people to bicycle transportation and had entrenched automobiles firmly within the luxury market.[11] His call for a true "volks auto," a "people's car," rang out across the industry and in the ears of his audiences, who became increasingly intrigued by his implicit claims that Germany could soon enjoy a consumer society as robust as that of the United States.

Volkswagen Production and Export Statistics, 1945–1962

	All vehicles	*Cars#*	*Transporter*	*Exports*
1945	1,785*	58		
1946	10,020*	7,677		
1947	8,987	8,987		1,656
1948	19,244	19,244		4,464
1949	46,154	46,146	8	7,128
1950	90,038	81,979	8,059	29,378
1951	105,712	93,709	12,003	35,742
1952	136,013	114,348	21,665	46,881
1953	179,740	151,323	28,417	68,754
1954	242,373	202,174	40,199	108,839
1955	329,893	279,986	49,907	177,657
1956	395,690	333,190	62,500	217,683
1957	472,554	380,561	91,993	270,987
1958	557,088	451,626	105,562	315,717
1959	705,243	575,407	129,836	404,185
1960	890,673	739,455	151,218	489,272
1961	1,007,113	838,513	168,600	533,420
1962	1,184,675	1,004,338	180,337	627,613

Notes: includes *Kubelwagens*: 1945, 1,727; 1946, 2,343.
#Beetles only until 1959. Beetle output in 1960, 725,927; 1961, 796,825; 1962, 819,326.
Sources: H. C. Graf von Seherr-Thoss, *Die Deutsche Automobilindustrie. Eine Dokumentation von 1886 bis 1979* (2nd ed., Stuttgart, 1979); Wood, *Volkswagen Beetle*; VW Archives.

Figure 3: Volkswagen export and production statistics from 1945-1962.

When no existing manufacturer satisfied his request for a mass-produced low-cost vehicle, Hitler resolved to nationalize the production of his "people's car." He asked his friend, Ferdinand Porsche, to design "a small 4-seater car … a sort of low-priced family car in which one could go for weekend trips," which would be mass-produced by the first German national firm, Volkswagen.[12] Figure 1 is a photograph of Hitler, his cabinet members, and Porsche at a design meeting in 1934, discussing the Type 32, which is a recognizable predecessor of the Volkswagen "Beetle," with a descendent still in production today.[13]

After a few more of these design meetings, Porsche presented Hitler with a model that could be produced efficiently on an assembly line for a low cost. Meanwhile, Hitler had orchestrated a massive building project to construct a Volkswagen manufacturing plant in Wolfsburg, Lower Saxony, yet another example of German economic nationalism at work. By 1937, the Nazi Labor Front began production of Porsche's Beetle, and Hitler claimed the title of "father of Volkswagen."

Within just a few months of the Volkswagen production launch, however, sales reports for the new Beetle fell embarrassingly below Hitler's anticipated demand. In an attempt to remedy the situation, Hitler devised a payment plan to accommodate self-financing of vehicle purchases. Essentially, employees of the state, who outnumbered private employees by the late 1930s, could elect to designate a portion of their regular wages to apply toward the purchase of a Volkswagen car.[14] Although the Nazi party enrolled a quarter of a million Germans in the "Volkswagen savers' fund," not a single finished Volkswagen was ever delivered to a customer.[15] Not only had Hitler overestimated the purchasing power of the domestic consumer market, but the Nazi invasion of Poland in 1939 had also re-directed the resources of the German state—including those of the Volkswagen factory—to the war effort. Some speculate that behind Hitler's public vision for economic revival through the Volkswagen campaign lay his true intention for nationalized auto production: the creation of an essential cog in the Nazi war machine.[16]

In addition to his Volkswagen program for German automobile production and consumption, Hitler began work on a revolutionary transportation network for his soon-to-be mobilized population, a project he called the Motoriesierung program.[17] He sought to continue the work begun during the Weimar Republic of the previous decade and connect the previously disjointed regions of Prussia, Austro-Hungary, and Western Germany with a vast network of paved highway systems. Like the state-run auto production project, the plan to construct giant freeways promised to be a huge economic stimulus as well as a solution to the troubling unemployment problem in Germany at the time. Massive injections of state capital and totalitarian labor organization resulted in an

unprecedented roadway system by the late 1930s.

Figure 2 depicts this autobahn network as it existed in 1939, after just six years of Nazi-led construction. Of course, as was also the case with nationalized auto production, the construction of the autobahn served a primary military purpose, and as such became a major asset to the Nazis just months later when the Second World War began. Regardless of the original Nazi motive behind its construction, the autobahn, coupled with the Volkswagen project, revealed deep interest of the Nazi party in a comprehensive motorization program. By the late 1930s, the Nazi motorization program had established a legacy of efficient production. The program also inspired in the German bourgeoisie a budding faith in state intervention that would continue to flourish in the postwar period. [18]

II. Post-War Allied Control

With the defeat of Germany at the end of the Second World War, the Allied powers divided the management of German territory among themselves. In 1945, the British military occupied the region of Lower Saxony, in which the Volkswagen factory at Wolfsburg was located.[19]

When the British forces discovered the manufacturing plant, it was in a state of disrepair and was missing portions of its roof and production floor due to heavy Allied shelling in the area in the months prior.[20] Still, the British recognized the great value of such a massive and well-capitalized factory. Although the factory had produced amphibious military vehicles exclusively since 1942 after the failure of the Nazi consumer auto program and the start of the war, British officers discovered two prototypes of Porsche's original Beetle design in the factory's storage facility. A shrewd businessman in his own right, British Major Ivan Hirst, leading Allied occupation of Lower Saxony in 1945, recognized the potential of both the Volkswagen design and the Wolfsburg plant, and he resolved to take control of the factory, "to make essential repairs, and to begin building small numbers of the original VW cars."[21]

In an effort to revitalize Volkswagen production, Hirst solicited the investment of British and American businessmen, who immediately rejected the proposal for two reasons: they found the Porsche design to be highly unattractive, and, more importantly, they refused to involve themselves in a formerly Nazi operation. Always the optimist, Hirst appointed himself general manager of the Volkswagen factory and produced several thousand vehicles per year from 1946 until 1948, which he sold to the British military.[22] Without resurrection by the British and without the British military's purchase of Volkswagen autos in the immediate postwar years, the company would not have survived into the 1950s and certainly could not have become the paradigmatic firm of the Wirtschaftswunder.

On the whole, the West German auto industry revived slowly relative to other countries in Western Europe for several reasons. First, the commitment of the Allied powers to peace on the continent led them to dismantle German heavy industry in 1945 and to discourage a rebirth of German industrialism until 1949.[23] Second, the war had depleted the readily available supply of steel in Western Europe, and what quantities were available were diverted away from West Germany in favor of France.[24] Third, the West German auto industry lacked both a production supply chain and a consumer market in the immediate postwar period.[25] Volkswagen, however, thanks in large part to Hirst's foresight, was exempt from all three of these impediments to recovery and quickly became the largest firm in West Germany. By making use of his esteemed reputation among the Allied leaders, Hirst defended Volkswagen from the dismantling program, employed a bartering system in order to acquire steel, parts, and supplies, and funneled finished Volkswagens to the consumer market in Britain in the absence of qualified German consumers.[26]

In fact, the war had created a high recovery demand for a small and inexpensive middle class family car, and, as "the only cheap car widely available, the VW sold easily."[27] Hirst's decision to continue to produce "Hitler's car" Hitler's way proved so successful that the

Soviet Union, whose occupational border lay just five miles outside of Wolfsburg, asked the British to renegotiate the dividing line in order to take control of Volkswagen.[28]

By 1948, the United States' Marshall Plan had provided Germany with sufficient means for economic recovery and with the support it needed to embark on major currency reform, which facilitated tremendous economic recovery because it closed the "dollar gap" and allowed German firms to trade on the international market with a convertible Deutsche mark.[29] When a new West German government was established in 1949, Hirst relinquished control of Volkswagen to the state, under the care of former Opel executive, the very "knowledgeable, ambitious, and autocratic" Heinrich Nordhoff, who expanded production and marketed the VW to the rising West German consumer.[30]

By 1951, the West German automobile industry had "regained its prewar level of output," solely because of the success of Volkswagen.[31] Figure 3 evidences the continued boom in export sales in the early 1950s, rising from one third of total output in 1950-1951 to over half in 1955, requiring the establishment of many new production facilities."[32]

When asked to comment on the reason for Volkswagen's tremendous progress, Nordhoff said, "By one of those ironic jokes history is sometimes tempted to produce, it was the Occupation Powers who, after unconditional surrender, brought Hitler's dream into reality."[33, 34]

III. The ECSC and the First Steps Toward Economic Integration

Thanks to the stabilizing effects of the U.S. Marshall Aid program, by 1951 Western Europe was prepared to accept the view of the French politician Robert Schuman, who argued that Europe needed to create an economic union so as to "make war not only unthinkable but materially impossible."[35]

Leaders from six core Western European nations, namely, France, Germany, Italy, and the three Benelux states, Belgium, Luxembourg and the Netherlands, met to negotiate the Treaty of Paris. Because of the crucial importance of heavy industry to both the war and recovery efforts, these leaders were eager to preserve peace and promote prosperity by creating the first system of mutual regulation and the first common market for coal and steel, the production regulation of which would be placed under a common High Authority.[36] The Treaty of Paris also placed under Community control the resource-rich regions of Western Germany, namely, the Ruhr and the Saar, from whence most Community coal and steel would come. This common market agreement, which effectively created the European Coal and Steel Community, or ECSC, became the world's first international economic system and was the first practical step in the fulfillment of the dreams of utopian visionaries like Jean Monnet, who pined for a cohesive "European federation."[37]

Unfortunately for Germany and especially the West German auto industry, France had led the campaign for economic integration with her strong desire to cripple the German economy. German Chancellor Konrad Adenauer, well aware of French intentions, acquiesced to French demands in an effort to project a new image of Germany as a willing and able partner to the nations of Western Europe. Thus, although the Treaty Establishing the European Coal and Steel Community outlines the primary tasks of the Community as the obligation to "'assure to all consumers in comparable positions within the common market, equal access to the sources of production,'" German industries received proportionally far less coal and steel than did industries in other Community member countries. In fact, according to economic historian Steven Tolliday, "one of the greatest difficulties for VW, as for most other German manufacturers between 1949 and 1952, was securing adequate steel supplies."[38] Nevertheless, due to Nordhoff's leadership and because of his esteem among political leaders of the ECSC member countries, Volkswagen was uniquely able to barter for the steel supply so crucial to automobile manufacturing and so was spared from the totality of the strong anti-German bias maintained by the French.[39]

Despite France's strong anti-German platform, the German economy continued to thrive under the ECSC arrangement. In Special Report number 34, Great Britain's Economist Intelligence Unit explained that, of the many and varied reasons for economic integration, perhaps the most compelling was "the need to derive the cost saving benefits from operating at economies of scale; furthermore, in the context of ever increasing competition in world markets, the quest for these economies has intensified." [40]

Volkswagen's early 1950s boom proved the power of market expansion. While the firm had saturated the qualified domestic market with its Beetle by the late 1940s, the opening of a new common market in 1951 paved the way for Volkswagen's rapid rise to industry preeminence, in part because, in addition to its common market for coal and steel and its general regulatory measures, the ECSC served to bolster the European middle class, thereby creating a new generation of qualified consumers for VW's cars.

Also, simultaneous to this first stage of economic integration in Europe and thanks in large part to Community regulation was the reform of German monetary policy and the stabilization of its Deutsche Mark. Without such reforms, Volkswagen could not succeed in an international market, not only because of the insurmountable "dollar gap" but because war-time hyperinflation and the suspension of the gold standard had rendered the Deutche mark as valuable as bathroom tissue.[41] Thanks in large part to the creation of the ECSC and its institutional framework, by the mid-nineteen fifties, VW was the largest auto producer in Germany, and with the next stages of economic integration, it would become the largest in all of Europe.

IV. Further Integration with the EEC

By the late 1950s, the economies of the six core member states of the ECSC had recovered to such an extent that momentum toward further integration proved imminent. In 1957, the leaders of France, Germany, Italy, and the Benelux states convened upon the ancient Capitoline Hill to sign the Treaty of Rome, which established the European Economic Community, or EEC. Primarily, this new community agreement aimed to remove trade barriers between member countries, establish a customs union, and create a common market of goods, capital, and labor. An excerpt from the preamble to the Treaty details the vision of the six member states for the new Community:

> "His Majesty, the King of the Belgians, the President of the Federal Republic of Germany, the President of the French Republic, the President of the Italian Republic, Her Royal Highness the Grand Duchess of Luxembourg, and Her Majesty the Queen of the Netherlands, determined to lay the foundations of an ever-closer union among the peoples of Europe, resolved to ensure the economic and social progress of their countries by common action to eliminate the barriers which divide Europe, affirming as the essential objective of their efforts the constant improvement of the living and working conditions of their peoples, recognizing that the removal of existing obstacles calls for concerted action in order to guarantee steady expansion, balanced trade and fair competition, anxious to strengthen the unity of their economies and to ensure their harmonious development by reducing the differences existing between the various regions and the backwardness of the less-favored regions, desiring to contribute, by means of a common commercial policy, to the progressive abolition of restrictions on international trade […] have decided to create a European Economic Community.[42]

Thus, inspired by the success of the ECSC stage of integration, the leaders of the six member states created the EEC out of a desire for deeper economic integration in Europe, believing that together, by "eliminating the barriers" to trade, they could rise to greater heights of "economic and social progress" than could any one country on its

Pre-Tax Profits as a Percentage of Sales Receipts					
	Volkswagen			Ford	Opel
	Sales (DMmillion)	Profit	%	%	%
1956	1,788	188	10.5	6.6	8.0
1957	2,236	312	14.0	2.2	9.6
1958	2,719	430	15.8	4.6	13.2
1959	3,544	521	14.7	7.0	NA
1960	4,607	458	10.0	8.6	18.9

Source: Supervisory Board Working Committee 4 May 1961 and *passim*.

Figure 4: Volkswagen pre-tax profits as a percentage of sales receipts, 1956-1960.

own.[43]

In the words of the newly appointed EEC Commission head, Roland Mussard, "It is no exaggeration to state that, economically, the Rome Treaty is basically Treaty for more competition… it has been considered as one of the principal pillars on which our building rests."[44]

Competition stimulated technological innovation and would, according to the liberal policy makers of the late 1950s, control firm size and strength.[45] Yet, leaders of the Commission—men like Hans von der Groeben—also knew that the greatest threat to the future of free trade in the EEC was the "erection of private barriers to trade by international cartels," whose actions would "virtually undo the opening of the markets and to prevent, or at least unduly to delay the action needed to adapt them to the Common Market."[46]

As a result, the Treaty of Rome included an anti-trust clause in Articles 85 and 86, which contained a description of the consequential price controls that awaited violators of the treaty's anti-trust agreement.

In 1957, the Volkswagen Company seemed anything but a monopolistic cartel. Of course, it had claimed the greatest market share by the time German Chancellor Konrad Adenauer signed the Treaty of Rome, but it continued to experience fierce domestic competition from Bayerische Motoren Werke AG, or BMW, Daimler-Benz, and Opel, and even stronger international competition from French Renault, Italian Fiat, and American General Motors and Ford. Within a decade, however, after its acquisition of both Audi and NSU Motorenwerke AG, Volkswagen would become the largest European auto manufacturer and an increasing concern to proponents of the Treaty's anti-trust clause. Yet, even as early as 1959, the Commission recognized Volkswagen's dominance in the affordable auto market. At the behest of the EEC Commission, the German Federal Government was required to intervene in Volkswagen's pricing structure because of the lack of competition for its iconic and wildly popular Beetle.[47]

Despite admonition for its violation of the Treaty of Rome's anti-trust law, Volkswagen continued to annex its smaller German competitors and even some of its supply chain producers.

Herein lies yet another advantage of EEC membership for Volkswagen: practical enforcement of the anti-trust clause fell to the member states, which, in the case of Germany, was "sufficiently lenient to allow licensing of almost all merger applications" such as VW's acquisitions of Audi and NSU, yet the anti-trust clause protected Volkswagen from cartel-like competition that could arise in other EEC member states.[48] Ultimately, even with the moot anti-trust clause and its loose enforcement policy on the part of the German state, the creation of the EEC allowed Volkswagen access to an even broader common market in a customs union and access to increased production resources and financing opportunities. By the time the EEC came into full effect in 1958, Volkswagen was the largest automobile manufacturer in Europe, and VW Beetles dotted highways and dirt roads alike from Normandy to Napoli.[49]

V. Economic Analysis

During the later stages of the economic integration project in Europe, liberal European economist Andreas Predohl proclaimed that "Since the late 1950s, when the major European currencies became convertible, a multilateral

trade liberalization would have been more advantageous than Western European regional integration."[50] Predohl continued to argue that "Although the net effect of west European economic integration has been beneficial, a reduction of trade restrictions on a non-discriminatory, multilateral basis—with liberalized imports competing with the products of the most vulnerable domestic industries—would have generated even more economic growth."[51] In quantifiable terms, Predohl was correct. Access to an even larger, even more qualified consumer market in the 1940s and 1950s could have resulted in even more remarkable success for firms like Volkswagen. After all, German economic growth, even at a microeconomic level, had always depended more on foreign markets and exports than it had on its own domestic consumption.[52]

—Coal and Road Motor Vehicles as Percentages of West Germany's Intracore and Extracore Exports of All Commodities, 1952, 1957, 1963, and 1968[a]

	1952	1957	1963	1968
Coal[b]				
Intracore	17.9	10.7	6.4	3.5
Extracore	1.6	0.4	0.3	0.2
Road motor vehicles[c]				
Intracore	5.1	7.8	11.2	10.4
Extracore	5.3	11.1	15.7	17.4

[a] The Saarland is included after 1957.
[b] Includes coke and briquettes. Corresponds to Group 311 of the Original SITC, and to Group 321 of the Revised SITC.
[c] Corresponds to Group 732 of the Original as well as the Revised SITC.
Source: *Commodity Trade Statistics*, Statistical Papers Series D (New York: United Nations Statistical Office, annual issues).

Figure 5: Coal and road motor vehicles as percentages of West Germany's intracore and extracore exports of all commodities, 1952, 1957, 1963, and 1968.

Historically, however, Predohl was wrong to dismiss the ECSC and EEC as unnecessary and onerous. Like all German firms in the immediate postwar period, tainted by the stigma of Nazi association, Volkswagen required the protection and opportunities afforded by the creation of the economic communities of the 1950s. The exigencies of the immediate postwar period made Volkswagen's participation in a liberal international market impossible, had such a market even existed in the late 1940s. Thus, as is shown in Figure 4 (preceding page), by employing the business model established by Hitler in the 1930s—the mass production of a single low-cost vehicle—within the economic communities of the 1950s, Volkswagen enjoyed massive profit margins, even relative to its West German competitors.

Similar to Figure 4 (preceding page), Figure 5 (above) illustrates the success of Volkswagen in the 1950s. [53] This table quantifies the West German exportation of road motor vehicles from 1952 until 1968 reveals the extent to which the West German auto industry, led by Volkswagen, relied on the intracore market during the recovery period, as intracore exportation was almost equal to total extracore exportation (96%).[54] It also demonstrates the remarkable speed of the West German auto industry's recovery and its ascendancy in extracore markets in accordance with the principles of comparative advantage.[55]

By 1968, West German auto firms—Volkswagen in particular—exported to EEC core countries only 60% of what they exported outside of the core. Such a surge in auto exports outside of the EEC also correlated to an increase in West German importation of foreign automobiles from other core countries, most notably French and Italian firms like Renault and Fiat, as a result of mediated EEC competition.[56]

Moreover, the increase in Volkswagen exports outside the core in the 1960s substantiates the claim that Volkswagen's multinational transactions facilitated European integration, merging economies via trade even before those economies were united institutionally. Thus, Volkswagen's

relationship to European integration is multi-dimensional; without the early institutions of the ECSC and EEC, Volkswagen could not have survived the immediate postwar period By the 1960s, Volkswagen's success in markets throughout Europe integrated economies before the institutions did.[57]

As both Figure 4 and Figure 5 make clear, firms like Volkswagen needed the ECSC and EEC during postwar recovery. Only by recovering within the regional core Community could Volkswagen then rise to international trade predominance outside of the Community postrecovery. Thus, this economic analysis offers quantifiable support for the rejection of Predohl's liberal claim that the ECSC and EEC were of no benefit to European firms such as Volkswagen in the postwar period.

Conclusion

In the immediate postwar period—in a time of physical devastation, resource scarcity, hyper-inflation, and non-controvertibility of national currencies—in a time when no European would willingly drive "Hitler's car," even if it could be produced—liberalized bi-lateral international trade, especially of the German Volkswagen, was inconceivable. Anti-German biases, a desire to control valuable resources, an absence of trade mechanisms, and a lack of a consumer market necessitated the creation of economic communities in the postwar period.

Only within the structures of the ECSC and EEC, only by the process of economic integration in Western Europe could Volkswagen survive the postwar recovery period and later become the preeminent automobile manufacturer on the European continent. Ultimately, as the reconstruction period ended and the period of twentieth century economic boom began, Germany's own domestic policies, which eventually became relatively more liberal than those of its neighbors, contributed to the increasing success of German business, including the Volkswagen firm. In the immediate postwar period, however, Volkswagen owed its growth to its place within a common European market. The common markets for both resources and trade and the communities that governed them facilitated the German Wirtschaftswunder and enabled Volkswagen not only to become the largest automobile producer in Europe but also to, in turn, facilitate the integration of new economies into the European core.

Endnotes

1. Andreas Grotewold, "West Germany's Economic Growth," *Annals of the Association of American Geographers,* Vol. 63, no. 3 (Sept., 1973), 353.

2. There exists a huge gap in the literature on this topic. For example, none of the seven major economic think tanks that published regular volumes of analysis on the European auto industry in the late 1960s, 1970s, 1980s, and 1990s have published reports on the industry from 1945 until 1965.

3. Mancur Olson, *The Logic of Collective Action*. Harvard Economic Studies, 1965. In this work, Olson described the way in which war minimizes the strength and reduces the number of cartels and special interest groups whose power could otherwise dominate an economy.

4. *Globalization or regionalization of the European car industry?*, eds., Michel Freyssenet, Koichi Shimizu, Guiseppe Volpato. New York: Palgrave MacMillan, 2003.

5. This project was largely inspired by the extraordinary work of the Bruegel Economic Think Tank, headquartered in Brussels. Bruegel recently published its EFIGE dataset, which examines the competitiveness of firms in seven Western European countries from 2008 until 2012.

6. Wolfgang Konig, "Adolf Hitler vs. Henry Ford: The Volkswagen, the Role of American as a Model, and the Failure of Nazi Consumer Society," *German Studies Review*, Vol. 27, no. 2 (May, 2004), 251.

7. Konig, "Adolf Hitler vs. Henry Ford," 251.

8. Konig, 251.

9. In the 1990s, Volkswagen was forced to make reparations to several hundred Holocaust vitims, who claimed that they were spared from the Dachau and Auschwitz concentration camps in exchange for their forced labor at the Volkswagen factory at Wolfsburg. They reported that as many

as 15,000 Jews and enemies of the Nazi regime were made to work as slaves in Volkswagen production during the war.

10. Konig, 251.

11. Konig, "Adolf Hitler vs. Henry Ford," 251.

According to Wolfgang Konig, Hitler hoped that he could emulate Henry Ford's success in mass producing middle class vehicles and transforming the German population into a people of motorists.

12. Tolliday, "Enterprise and State," 278.

13. 1934 design meeting, Adolf Hitler and Ferdinand Porsche, discussing the Type 32 Heinkelscooter, Volkswagen.

14. James Michael Laux, *The European Automobile Industry*. (New York: Twayne Publishers, 1992), 137.

15. Tolliday, "Enterprise and State," 283.

16. Tolliday, 279. Here, Tolliday cites the work of Richard Overy, who rejects the claim that Hitler intended the Volkswagen factory not to produce cars for the German people, but to manufacture military vehicles for the war he anticipated in the late 1930s. According to Overy, the VW project was driven much more by "national, symbolic and economic motivations rather than by rearmament and war preparedness."

17. Tolliday, "Enterprise and State," 279.

18. Laux, *The European Automobile Industry,* 123.

19. Laux, 169.

20. Volkswagen AG, *Volkswagen Chronicle, Vol. 7: Historical Notes*. (Stadtoldendorf: Werbedruck Lonnecker, 2003), 10.

21. Laux, *The European Automobile Industry,* 168.

22. Volkswagen AG, *Volkswagen Chronicle, Vol. 7: Historical Notes,* 10.

23. Laux, 168.

24. Laux, 168.

25. Laux, 168.

26. Laux, 169.

Volkswagen AG, *Volkswagen Chronicle, Vol. 7: Historical Notes,* 10. Coal was an absolutely essential resource for auto manufacturing in the postwar period. Volkswagen's own company Chronicle admits that Volkswagen would not have ob-tained the coal it needed to produce cars without first the leadership of Ivan Hirst and second without the institution of the ECSC.

27. Laux, *The European Automobile Industry,* 170.

28. Laux, 169. I dispute the arguments of those like UCLA's own Roland Francis Stephen, who, in his Political Science PhD dissertation advised by Comparative Government expert Dr. Ronald Rogowski, claimed that the German government embraced a very "liberal" policy towards its auto sector, aside from its efforts to privatize the formerly state-run Volkswagen company. In actuality, VW production in the late 1940s and early 1950s was carried out in accordance with Hitler's original, very regulated business model.

29. By some calculations, West Germany received about 12% of the total Marshall Aid funds given by the United States to its partners in Europe.

30. Laux, 170.

31. Laux, 168.

32. Laux, 185.

33. Laux, *The European Automobile Industry,* 185.

34. Tolliday, "Enterprise and State," 326.

35. Robert Schuman, "Notion of Structural Peace" speech, 1950.

36. Grotewold, "Western Germany's Economic Growth," 354.

37. For Monnet, the common market would be just one small part of a larger project of European integration and the creation of a single, unified European federation.

38. Hans A. Schmitt. "The European Coal and Steel Community: Operations of the First European Antitrust Law,1952-1958," *The Business History Review,* Vol. 38, No. 1, International Government-Business Issue(Spring, 1964), 105. Treaty Establishing the European Coal and Steel Community, English translation published by the High Authority of the European Coal and Steel Community (Luxembourg, n.d.), Art. 36.)

Tolliday, "Enterprise and State," 313-314.

39. *Laux, The European Automobile Industry,* 169.

40. Economist Intelligence Unit (Great Britain) West European motor industry: where now? 1976. EIU Special

Report No. 34. (Spencer House, 27 St. James's Place, London

SW1A 1NT), 63.

41. Grace A. Ballor, "Forged from Fire: An Exploration of the Bundesbank's History and Its Influence on E.U. Finance," University of California, Los Angeles, March 2013.

42. Treaty of Rome, Preamble, 1957.

43. It is important to note that, while German Chancellor Adenauer practiced a great deal of political posturing in the early 1950s, his agreement to the 1957 Treaty of Rome stemmed from his belief that membership in the EEC was truly best for Germany and for Europe as a whole.

44. D. L. McLachlan and D. Swan, "Competition Policy in the Common Market," *The Economic Journal,* Vol. 73, no. 289 (Mar., 1963), 54.

45. Grotewold, "Western Germany's Economic Growth," 361.

46. McLachlan and Swan, "Competition Policy in the Common Market," 54.

47. Federal Cartel Office, Annual Report for 1959, p. 57.

It seems as though Germany, eager to prove itself a cooperative partner to its European neighbors, more readily embraced any EEC measures than any other country. Whereas the Italian, French, Dutch, Belgian, and Luxembourgian governments put the anti-trust laws into effect slowly (if ever), Germany had exercised the punitive powers of Articles 85 and 86 several times by 1962. In 1961, the Economic and Social Committee of the EEC Commission determined that "The Member States are not inclined at present, or in the near future, to divest themselves of their prerogatives and hand over to a supranational authority the task of condemning or approving the cartels."

48. Schmitt, "The European Coal and Steel Community," 122.

49. During this time, Great Britain and the United States also began to import an increasing number of Volkswagens. Their markets responded to the growing esteem of the German firm because of its status as an industry leader within the Community. In addition, consumers all across the Western world came to prefer the unique aesthetic of the Beetle, and, ironically, it became a counter-cultural product particularly within the United States.

50. Grotewold, "Western Germany's Economic Growth," 353.

51. Grotewold, 364.

52. Grotewold, 360.

53. Germany's growth was historically export-led. Tolliday, "Enterprise and State," 337.

54. The term "intracore" refers to transactions and trade within the common market for goods, established by the ECSC and EEC.

55. An increase in extracore trade was facilitated by the post-war revolution in shipping networks, which kept the cost of transporting a finished Volkswagen across the Atlantic at just 1/10th of the purchase price. Grotewold, "Western Germany's Economic Growth," 361.

56. Grotewold, "Western Germany's Economic Growth," 360.

57. Grace A. Ballor, "An Economic History of Multinational Firms and the European Union, 1950-2000," Ph.D. diss. University of California, Los Angeles, forthcoming.

58. Grotewold, "West Germany's Economic Growth," 358. Grotewold borrowed this statistical data from: Commodity Trade Statistics, Statistical Papers Series D (New York: United Nations Statistical Office, annual report).

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The History and Evolution of Motometers

By Francis G. Clax

Photography and ads from the author's private collection unless otherwise noted

Since 2008, interest in motometers (more technically termed, "Early Twentieth Century Automobile Radiator-mounted Engine Temperature Indicators") has been significantly growing. Most of that interest is centered around selling and collecting these artifacts belonging to the long bygone era of the early 1920s as the internal-combustion type engine was generally accepted as the go-to engine type of auto manufacturer and buying public preference.

Figure 1: Can you tell which is a reproduction and which is an authentic original?

Interest for these automobilia collecting enthusiasts seems to be based upon acquiring these last vestiges of defunct automobile manufacturers, such as Mercer, Haynes, Packard, Nordyke & Marmon or, even Mitchell for example among hundreds of others no longer with us as operational business concerns.

Just as fervent motometer collecting began to heat up in this century serious elite motometer automobilia collectors began wanting to know more about their truthful origins and to have a more accurate historical record established, hence this article.

The article author offers a rare and unique opportunity albeit condensed to provide a fact and physical evidence-based historical account on these devices whose descendents are still a vital component in today's vehicles.

A couple of attempts were made to put forth a record of invention for motometers. However, the two main sources of generally accepted "accurate" information unfortunately got certain portions of that "history" wrong or incomplete.

In the Spring 1976 Issue (Number 5) of the Society of Automotive Historians' *Automotive History Review*, automobile enthusiast and then SAH member Harry Pulfer of La Crescenta, California, wrote the article "Highlights of the Development of Moto Meters and Heat Indicators" that appeared within. Mr. Pulfer included copies of various motometer brand advertisements and statements as evidence and proofs; however, certain portions of his writings have since been found incorrect based upon numerous authentic original company documents, records, exhaustive research and extensive artifact collection and preservation not in his possession but now in this author's.

In the years that followed, another automobile enthusiast, Victor Koma, picked up on Pulfer's motometer account and wrote his own brief historical account "Reaching the Boiling Point—A History of Boyce Moto Meters" that Internet sources have proliferated without consideration for accuracy, corroboration or evidence.

The inaccuracies in Pulfer's article begin with his statement of "1910—An ad in *The Antique Automobile,* [January] 1961, by Omega Service Parts Company of New York City, pictured a radiator temperature gauge 'made by

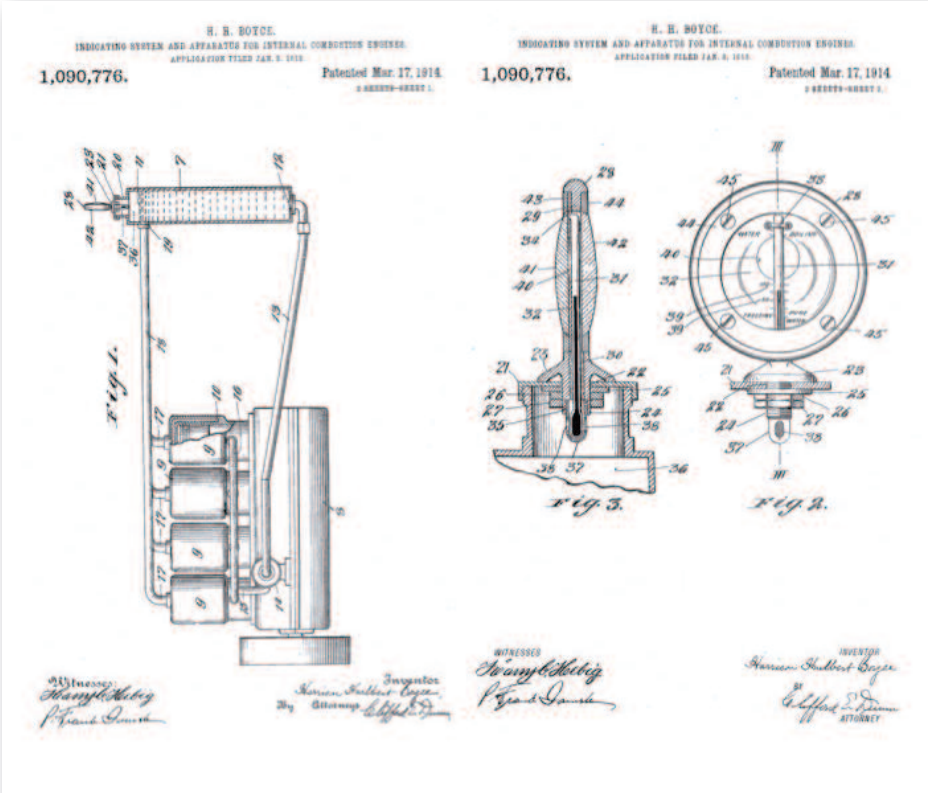

Figure 2: Boyce fundamental Indicator Apparatus Patent (1914).

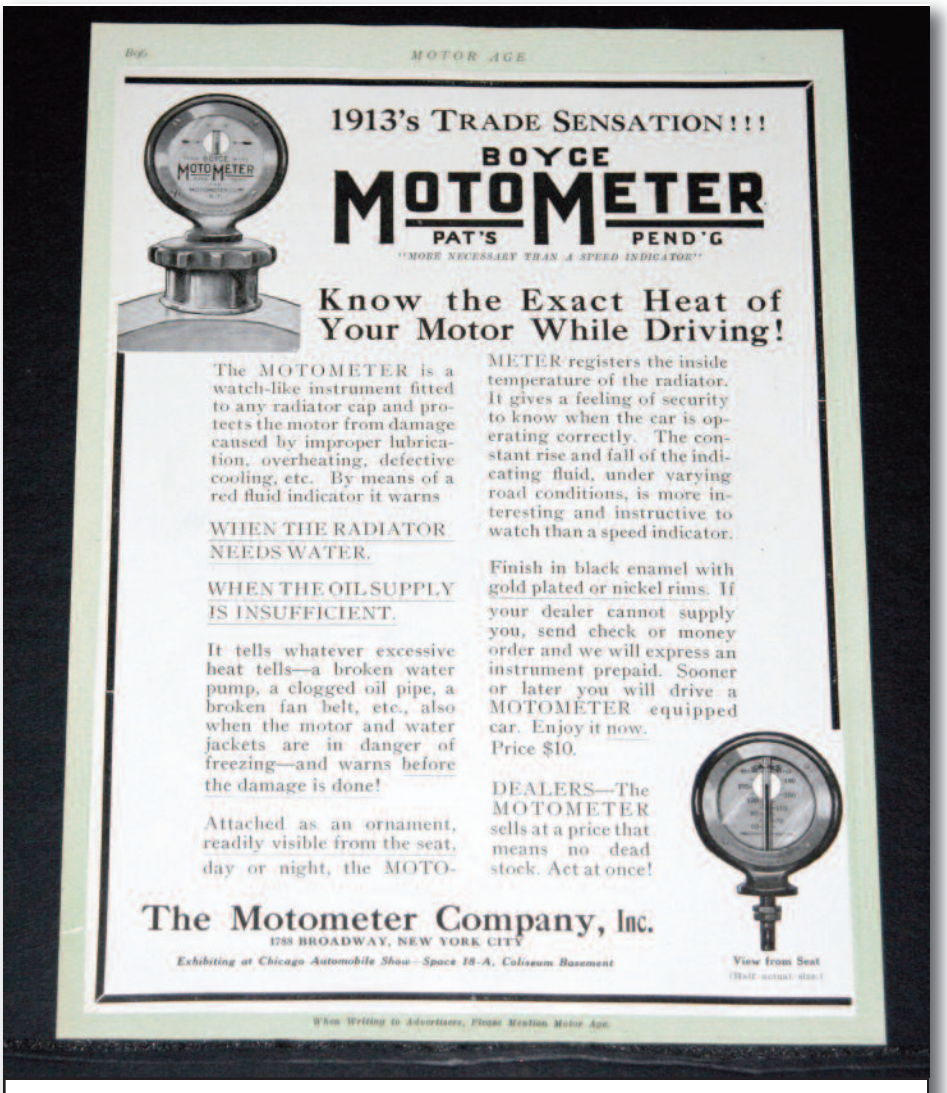

Figure 3: Boyce print advertisement (1914).

Messko (since 1910 in West Germany)."

The Messko information is fully unsupported by the Messko Corporation's own historical founding records along with the incontrovertible fact that the Messko Hauser company was founded on November 1, 1911 by Albert Hauser, who only in 1922 began work on his Messko (automobile) "Radiator Thermometer" (not commercially available until 1925).

Research of the Omega Service Parts Company brings forth an advertisement wherein the company promotes its sale of Messko Tire Gauges *(Popular Mechanics*, Volume 108, Number 5, November 1957, page 48), which might explain their motivation in putting forth less than truthful information regarding the earliest manufacturing date of the Messko "Radiator Thermom-eter," and possibly bolstering Pulfer's reproduction product business sales interest.

No patents for the Messko "Radiator Thermometer" are known to exist. Seemingly by no accident the Messko "Radiator Thermometers" are of the same dimensions and design as Boyce Moto-Meter "Standard, Junior and Midget" Types, which were patented and in full circulation before Messkos.

By the time the earliest Messko Radiator Thermometers were actually commercially marketed in Germany (1925) Harrison Boyce had long since received a patent for his "Indicating System and Apparatus for Internal Combustion Engines" (U. S. Patent Number 1,090,776, issued March 17, 1914, see Figure 2) and been selling his devices in Europe as the Boyce Moto-Meter had been commercially marketed, available and introduced since approximately March, 1913.

In December of 1913 the Motometer Company released its earliest general public commercial advertisement for the Boyce Moto-Meter (see Figure 3).

It is also a fact that beginning in 1913 leading auto speedway racecar drivers, like Indianapolis International 500-Mile Sweepstakes winners, Peugeot French driver Jules Goux (1913) and race winner, Delage French driver, Rene Thomas (1914) were already using Boyce's device on their racecars long before the existence of Messkos. Boyce Moto-Meters would go on to be the only brand of radiator-mounted engine temperature indicators documented to have ever been installed on racecars excluding pre-1920's coolant

condensers only on certain cars.

Inaccuracies in Pulfer's and Koma's motometer accounts continued with a "storied" relationship between the generally accepted inventor of the first viable motometer temperature gauge, Harrison Hurlbert Boyce and the eventual founder of the Motometer Company, George Henry Townsend II. Victor Koma, in his account states "[I]n 1912, George H. Townsend, president of the Moto Meter Co. Inc., obtained the 'exclusive rights' under Boyce patents to manufacture radiator and dashboard motor temperature indicators."

Mr. Koma inadequately asserted that the Boyce Moto-Meter "was a type of thermometer incorporated into the radiator cap, or the radiator itself;" however, the Boyce Moto-Meter more correctly attached to a radiator cap by a threaded bolt and locking nut assembly which was then fastened onto an automobile radiator tank filler tube.

George H. Townsend and Harrison Boyce's agreement for George to market, manufacture, sell and distribute Boyce's temperature indicating device through a company of George's choice did in fact take place before George founded the "Motometer Company, Inc." (September 12th versus October 22nd, 1912, respectively).

The agreement as stated was not a strictly legally speaking "exclusive" under U. S. Patent regulations but was so termed by the U. S. Appeals Second Circuit Court decision rendering judge's opinion, in the case of *Boyce v. Stewart-Warner Speedometer Corp* (U.S., 220 F. 118 C. C. A. 2). Had there been an actual "exclusive" contractual arrangement Boyce would have transferred his patent rights to and in the name of George Townsend or his Motometer Company which never occurred.

George Townsend and Harrison Boyce's actual agreement was more like a licensing type arrangement especially once the financial particulars are examined and taken into consideration. Without going into greater specificity this "licensing–type" arrangement explains why in the myriad of patent infringement lawsuits involving the Boyce Moto-Meter they were legally required to be brought by Harrison Boyce, the patent holder, and not Townsend or his Motometer Company.

Also, in 1912, Boyce had not yet invented "dashboard motor temperature indicators," let alone included them in his initial product marketing and sale arrangement as it was not until some four years later (August 30th, 1916) that he applied for patent for his "Temperature Indicating System and Apparatus for Internal Combustion Engines" (Patent number 1,206,783, issued

BOYCE MOTO-METER 500-Mile Race Winner Ad
Automotive Industries journal, 1913

BOYCE MOTO-METER Again Wins Great Indianapolis Race Ad
The Automobile journal, 1914

Figure 4: "Boyce Moto-Meter 500-Mile Race Winner (1913) and "The Radiator Heat Indicator Again Wins Great Indianapolis Race (1914)" ads.

ENTERS ACCESSORY FIELD.

Motometer Company Organized in New York to Produce Novel Heat Indicating Device.

The Motometer Company, Inc., 1784 Broadway, New York City, recently organized, is one of the latest entrants in the automobile accessory manufacturing field. George Townsend, 2d., formerly an amateur racing driver- well known in automobile circles, is president and treasurer and Harrison Boyce is secretary. The company will market a new device invented and patented by Mr. Boyce and known as the motometer. It is an instrument which by an ingeniously arranged dial tells the driver at all times the exact heat of his motor and warns instantly when overheating is about to take place.

Mr. Townsend, together with Caleb Bragg, organized the first Yale hill climb at New Haven, Conn., some years ago and together they became well known amateur drivers, racing at numerous meets. Townsend ceased racing prior to Bragg's turning professional. Mr. Boyce has a reputation as an inventor of marked ability. He invented the first demountable rim upon which a patent was granted in this country. It was used on the Locomobile racer in the 1905 Vanderbilt Cup race. He conceived a leather non-skid tire and formed the Healy Leather Tire Company and later he invented the Sireno horn and has been connected with the company manufacturing it for some time.

Figure 5: "Enters Accessory Field–Motometer Company Organized in New York to Produce Novel Heat Indicating Device," *The Accessory and Garage Journal, Volume 2,* Number 8, Dec. 1912, page 7.

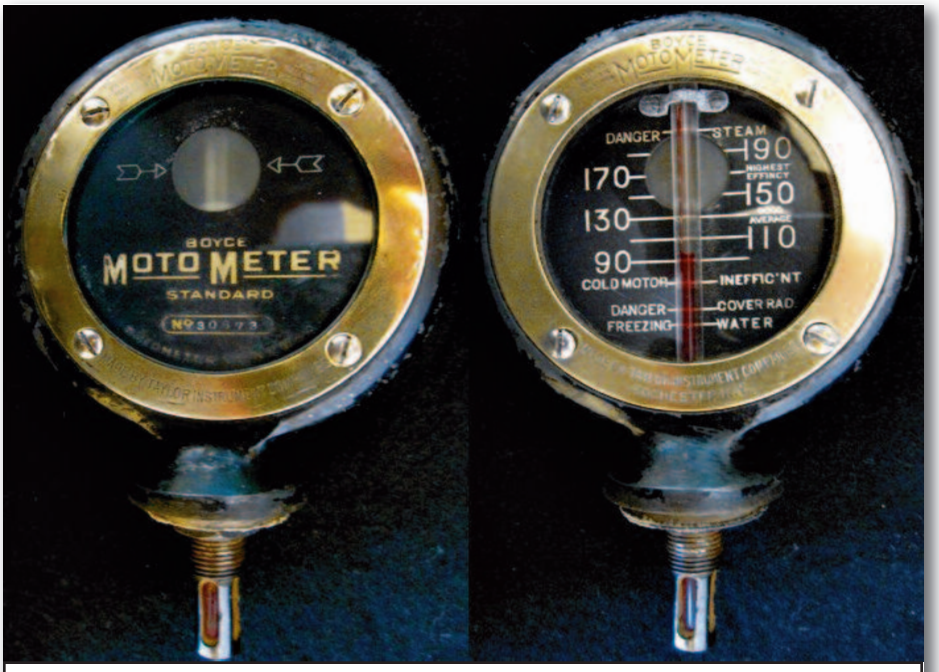

Figure 6: "Made by Taylor Instrument Companies" (1914) Standard Type Boyce Moto-Meter, front and rear views.

November 28, 1916) which formed the basis for the "Distance Type" Boyce Moto-Meter that in 1924 became the in-dashboard engine temperature indicating instrument product.

In an April 2016 discussion that the author had with Boyce's grandson, he informed me that he had a very early (pre-1920s) Moto-Meter Co. corporate meeting minutes document wherein Boyce vehemently argued against commercially introducing either the steering column or in-dashboard type Boyce Moto-Meters. It was an argument that he won or had overwhelming sway.

Harrison Hurlbert Boyce was a college-educated engineer and by 1912 was already well respected within the automobile industry for his invention of the skid-less leather tire and the demountable wheel among several other inventions. Besides already being involved with the auto industry Harrison lived along the course route of the Vanderbilt Cup races at Jericho corner on Long Island, New York. His home gave him a prime viewing vantage point to observe the races where he no doubt observed the vast majority of the racecars experience engine damaging overheating conditions and destructive failures. It is believed that at one of these races he met amateur hillclimb racer and future business partner George Henry Townsend II.

George Henry Townsend II was a fairly recent Yale University graduate (Class of 1908), who held a keen interest in automobile racing at the time—Fall of 1912—when he and Harrison Boyce forged the agreement for him (and a company of his choice) to manufacture, market, sell and distribute Boyce's temperature indicating device in exchange for a modest sum ($5,000) and royalties. Townsend had limited formal business operational experience though he had worked for the DuroCar automobile company and had co-founded the Yale Automobile Club with classmate, future professional Mercer Factory racecar driver and speed boat champion Caleb Bragg. Townsend decided to establish his own company to perform the agreed upon services.

Townsend was the one who gave Boyce's temperature indicating apparatus its commercial trademarked name, the "Boyce Moto-Meter." He later designed the laurel wreath glass crystal bezel/retaining ring and screw set seen on many Boyce Moto-Meters, along with an early version of the "Aristocrat" radiator cap (1928), the "Boyce Moto-Meter Lite and Ornament Holder" (1926) as well as other patented devices.

It was put forth in the *Boyce v. Stewart-Warner Speedometer Corp. of Chicago, Illinois* patent infringement lawsuit that Boyce might have taken note of a radiator-mounted water level indicator type device developed in 1907 by Chicago's Harry Vissering ("Indicator for Radiators," Patent Number 904,163 issued November 17, 1908).

Vissering's indicator was little more than a cylinder with a sight/viewing window enabling

bubbling hot coolant from the radiator to be observed prior to evaporation or re-entry back into the thermosyphon type engines of the period. Vissering's gauge was more akin to a water level gauge of the type used in conjunction with steam boilers.

Stewart-Warner was never able to prove that Boyce had prior knowledge of this device or that it was in any way similar to his indicator. Vissering's device did not show calibrated temperature, nor did it possess a predictive quality to forewarn of impending coolant overheating as with the Boyce Moto-Meter. Vissering's indicator device was not commercially successful and no examples are known to exist at this time.

Initially only one model or type as the Motometer Company referred to the devices was produced for racing and/or commercial passenger automobile use. It was called the "Standard" and was three and one-quarter inches in upper frame diameter with a scaled down thermometer and an exposed thermometer bulb at the end of the radiator attachment bolt.

Standard Type Boyce Moto-Meters were initially assembled by the Rochester, New York, thermometer manufacturing company Taylor Instruments because George Townsend's Motometer Company was very capital deficient, and possessed no factory or labor force.

Taylor received the frame housings (also called casings) from the Doehler Die Casting Company of Newark, New Jersey, and Toledo, Ohio, while Corning Glass Works supplied the glass crystals that covered and protected the thermometer.

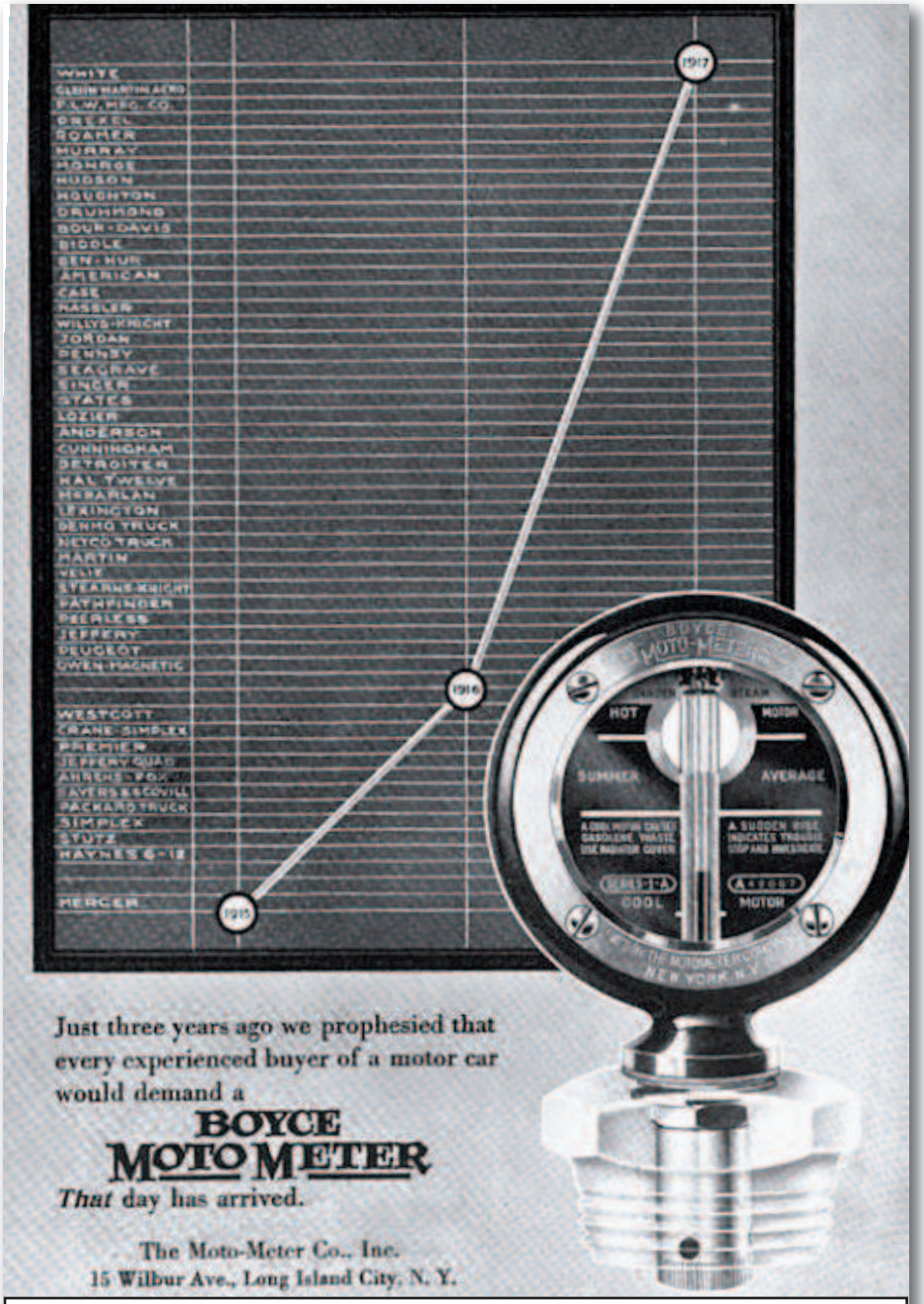

Figure 7: A 1917 Boyce Moto-Meter Automobile Manufacturer Sales Chart.

Once Taylor received all of the vendor components its precision labor staff would assemble or "make" the final Boyce Moto-Meter. The early Boyce Moto-Meters had the phrase "Made By Taylor Instrument Companies Rochester, N.Y.," stamped into the metal retaining bezel ring.

In October 1913, the Motometer Company commercially released a smaller version of the "Standard" to be known as the "Junior." The "Junior" Type, however, was not designed or manu-

Figure 8: Motometer Co. Wilbur Avenue Factory.

factured with glass crystals or the additional retaining bezel rings. These early Junior Type Boyce Moto-Meters were not notated with the phrase "Made By Taylor Instrument..." Both indicators used scaled-down thermometers of approximately 4.625 inches or 3.75 inches, respectively that were still able to reliably register temperatures from 32 degrees Fahrenheit to a steady 212.

As previously shown, top automobile racecar drivers early-on adopted the Boyce Moto-Meter realizing the strategic and tactical advantage of actually knowing exactly when to pit for coolant replenishment or to perform a maintenance check versus guessing or pitting too early.

The Boyce Moto-Meter proved helpful and successful in the 1913 and '14 Indy 500, the Elgin National series, French Grand Prix, Vanderbilt Cup races and most top tier racing events that followed well into the 1930s.

The Motometer Company's contractual relationship with Taylor Instruments was relatively short-lived, lasting from 1912 to 1916, due to Taylor not affording the fledgling Motometer Company delayed payment terms and instead insisting on immediate payment from the cash strapped company.

In any event, by late 1914 on the back of its great race event win, the Motometer Company was able to secure a contract with the Mercer Automobile Company of Trenton, New Jersey, to supply them with Boyce Moto-Meters for their 1915 new model vehicles. Mercer already had a particular familiarity with the company and its groundbreaking product through its factory sponsored racecar driver and George Townsend close friend, Caleb Bragg. Bragg started in the pole position at the 1913 Indianapolis 500 race using a Boyce Moto-Meter on his Mercer racecar.

Not to be outdone, other manufacturers added BOYCE MOTO-METERS to their vehicles, including Haynes, racing competitor Stutz Motor Company, followed closely by Packard Motor (for their trucks) and Simplex for their passenger autos. Seeing their competitors gaining an advantage eleven other car companies quickly signed up for 1916 with a total of 50 manufacturers by the end of the following year (See Figure 7: 1917 Boyce Moto-Meter Automobile Manufacturer Sales Chart).

Sales jumped to one million units versus the "measly" tens of thousands in the years before and far less in their initial sales year (1914). This boom in Boyce Moto-Meter sales, almost exclusively of the Standard Type, enabled the Motometer Company's financial situation to finally begin to

Figure 9: The author's Moto-Meter collection in a decorative display case.

become profitable.

In 1916, with substantial financial investment assistance from George Townsend's Yale University roommate Paul Lansing Veeder, the Motometer Company was able discontinue their business relationship with Taylor Instruments, acquire a factory located at 15 Wilbur Avenue, Long Island City, New York, hire an initial labor force of 49 employees and acquire some necessary equipment to begin making their own gauges onsite (Doehler Die-Casting continued to supply Moto-Meter frames).

Veeder, Yale's 1908 College All-American football player, had already assisted Townsend in initially organizing the company, and became its Corporate Secretary and Vice President (in charge of Operations) and would ultimately be the only person other than Townsend to hold a major stock position in the company.

After this period Boyce Moto-Meter sales were off and running at full speed. In 1918 sales reached 3,000,000 units and by two years later were up to four million "in use."

On August 13, 1918, the now spelled "Moto-Meter" Company trademarked the Boyce Moto-Meter that date was stamped onto their indicators along the upper right bezel area. (This date is all-too commonly misinterpreted as a specific unit's manufacturing date.)

By early 1919, Harrison Boyce, who had served as the Motometer/Moto-Meter Company Vice President (of Sales) and General Manager left the company to start a fire apparatus and decarbonizing gasoline additive product business, the Boyce Veeder Corp. with Paul Veeder.

Essentially from the beginning of the Boyce Moto-Meter's market introduction the company faced numerous challenges not the least of which were misunderstandings by the public of the product's purpose, intent and capability and patent infringement from would-be competitors.

At the Boyce Moto-Meter's inaugural introduction at the 1912 New York Auto Show, it was alleged that a high ranking company representative of the Stewart-Warner Speedometer Corporation (of Chicago) connived his way into acquiring a Moto-Meter for

Figure 10: 1922 Mercer Series 5 Sporting with a Moto-Meter installed.

the sole purpose of reverse engineering it to benefit his company. Within a month or so of the Boyce Moto-Meter's commercial introduction the Stewart-Warner Corp. released its own very similar "Radiator Thermometer" that would later be determined by the U. S. Court of Appeals to have violated Harrison Boyce's fundamental patent operating principles.

Immediately upon taking notice of a competing product on his newly created "motor heat indicator" market, Boyce did file for a patent infringement injunction against Stewart-Warner. Ultimately, Boyce won this lawsuit and by December of 1914 the "Radiator Thermometer" was barred from sales as designed.

Throughout the many years of the Boyce Moto-Meter's existence Boyce, et al., (the Moto-Meter and subsequently named "Moto Meter" Company) would sue for infringement the Heat-Ometer Company of Newark, New Jersey (1916), Times Square Auto Supply Co. of New York City (1916), Metalware Co. of Chicago, Illinois (1916), F. B. Stearns Co of Cleveland, Ohio (1920), Morris Coventry of England (1925), Semaphoric Indicator Co. of Chicago. Illinois (1925), Pyrene Manufacturing Co. of Newark, New Jersey (1925), Superior Brass Co. aka SUBRASCO of Patterson, New Jersey (1925), Wilmot Breeden LTD. of England (1926), Biddle Co., Standard Supply Co. of New Jersey, Gide Lite Manufacturing Co. of Chicago, Illinois, and Sunbeam Company of Wisconsin, though there may have been others.

Harrison Boyce and the Moto-Meter Company, irrespective of name spelling, successfully sued all of these companies for patent infringement. With limited exception these competitors among numerous others were forced to change the design of their radiator-mounted engine temperature-indicating devices.

Forced to abandon use of the radiator tank coolant filler tube vapor space area principle or similar use of a thermometer for their temperature monitoring gauges, competitors scurried to adopt alternative temperature sensing and driver alerting methods while still wanting a piece of this profitable new market.

Some of these alternative gauges relied upon variations of the temperature-responsive bimetallic, Bourdon Spring or a rotating arrow (or colored) temperature-indicating panel semaphore. Others relied on float-based mechanisms, steam-operated plunger-type semaphores, visible steam ports or a whistling signal. Still others utilized a thermo-reactive temperature-indicating color changing fluid such as the "Heat-Ometer."

In 1922 Stewart-Warner Corp. introduced the use of electronics with its "Warn-O-Meter" that tapped power from sparkplugs to illuminate a temperature-based color-coded light panels within the gauge followed by the "Automobile Radiator Cap" by Otto Bihlmire marketed as the "GideLite."

Ultimately the Boyce Moto-Meter would sell, or have "in use" some ten million units by July of 1926 in Australia, Canada, and

North America, with the company having factory locations in Canada, England, France, Australia, Germany and the United States, in particular.

Independent inventors and owners of casting companies hurried to make auto temperature indicators in a further attempt to gain a toehold in the rapidly-expanding market and to do so without violating Boyce's patented indicator principle and patent.

All sorts of temperature indicating methods were deployed—float mechanism-based water levels; visible steam emitting; steam pressure semaphore rising or audible signal emitting; arrow or colored panel articulating; and light panel illuminating devices. None of them were sufficiently successful on their own to dislodge the Boyce Moto-Meter's market dominance.

Motometers adorned automobile hoods, particularly in America, long before traditional hood ornaments. Hood ornaments, or automotive mascots as they are also known, only became prominent in the 1930s as engine temperature gauges became more frequently installed on steering columns or within dashboard instrumentation panels, and water pump and engine design technology improved.

Accessory items such as flamboyant Art Deco-style wings, light-equipped caps, decorative radiator caps and figurine mascot "toppers" began to be mass manufactured in the 1920s and purchased by individual auto owners as a style statement in addition to their motometer. This spawned a market onto itself.

Figure 11: A close-up of a 1923 Dusenberg 8 with Motometer & accessory wings.

And, while becoming evermore ornamental, decorative, aesthetically artistic and appealing the

Figure 12: 1922 Oldsmobile with Boyce Moto-Meter.

Figure 13: A marque-specific Moto-Meter, as installed on a 1923 Flint Sport Touring. Photo by Don Keefe.

motometer retained its purpose and function of indicating engine temperature versus being a solitary piece of brand sculpture like its hood ornament/automotive mascot brethren.

The Boyce Moto-Meter easily dominated the automobile motor heat/radiator temperature indicator market as an accessory or supplied piece of auto instrumentation.

The product had grown from a misunderstood novelty to the predominant engine temperature gauge of its time for race cars, passenger cars, commercial vehicles (trucks and farm/agricultural vehicles), airplanes and motorboats. No competing indicators are known to have individually or in combination sold anywhere near as many as the Boyce Moto-Meter.

In 1926, the Moto Meter Company acquired the National Gauge and Equipment Company of Toledo, Ohio, and changed its name to the Moto Meter Gauge and Equipment Co. (or Moto Meter G & E Co. as on its products, including sparkplugs, horns and ignition components). In 1934 that company was acquired by the AutoLite Company of Toledo, Ohio and completely dissolved.

Between 1914 and 1932—the heyday of radiator-mounted motometer invention and manufacturing—more than 200 indicator patents would be granted. Virtually none of these would achieve even a modicum of commercial success.

Years after the Moto Meter Company's demise, a former employee, Herman Schlaich, who set up the Moto Meter Company of Germany, would claim to have founded the original Long Island City Company and even invented the Boyce Moto-Meter!

Primarily in the 1950s Boyce Moto-Meters found resurgent popularity as hood ornaments on hot rodded custom cars. Old car enthusiasts put their old "temperature gauges" aside in garage toolboxes or on shelves. These actions would spur on and form the basis of artifact supply for today's collectors.

The Boyce Moto-Meter would go on to become a readily identified and accepted icon of the "Roaring '20s," automobile owner status symbol. It can be seen on vehicles in period movies, films, television programs and commercials to this day. I invite you to carefully watch *The Great Gatsby* (1974 and 2013 films), *The Betsy* (1978), *Cars* (2006), *The Munsters* and more recently *Cinderella Man* (2005) and *Men Who Built America* (2012) for example, among a great many more that use Boyce Moto-Meters as period-indicating props on similar period vehicles—most of which are unfortunately, modern reproductions instead of authentic originals.

According to *Printer's Ink* trade journal (August 10, 1922, Volume CXX, Number 6, page 10) "no other automobile accessory has ever approached the enormous

popularity of the Boyce Moto-Meter."

Although Moto-Meters are no longer mounted the radiators of today's modern vehicles, the basic technology, purpose and general temperature sensing principle(s) are still in use after more than one hundred years, serving a vital function. The role of the Boyce Moto-Meter extends well beyond its initial novelty and subsequent accessory status to that of an indispensible, normal and regularly installed instrument component of the auto dashboard.

Automobilia enthusiasts around the world are tuning in to collecting motometers of all types as relics of long gone antique automobiles, manufacturers and an era. With more collectors emerging each year it is tremendously important that an accurate record of the intruments' origin and history be established in place of misinformation, myth and lore while the opportunity exists. These enthusiasts and others, such as museums and historical societies, are hungry for real facts and the truth about these early automotive industry relics; hence this article and other efforts by its author, a fervent motometer automobilia collector.

Automobile enthusiast Harry Pulfer may have been influenced by his entrepreneurial pursuit of selling reproduction automobilia and motometer components (including Messko Radiator Thermometer-based faux Boyce Moto-Meters) that still circulate unbeknownst to their current owners on secondary markets as authentic originals to this day. As an artifact and subject-specific preservationist this author has no such motivation.

Almost all of us have overlooked the importance and historical significance of engine temperature gauges, except on very cold winter days or when our engine has already overheated.

The history of vehicle temperature indicators of all types can be traced back to Harrison H. Boyce and his groundbreaking invention. Its influence can be seen on today's battery, braking and tire temperature sensors and battery electric power generation units. Even turbo compressor units used on Formula 1 racecars and "Check Engine" light signals have their origin in the early 20th Century's Boyce Moto-Meter. And now is the time to correct the history and origin of these "most necessary" instruments.

Much more information on motometers can be found on the author's website at www.motometercentral.com.

The answer to the opening image question is: The reproductions are on the left side and the authentic, originals are on the right.

Disclosure/Disclaimer

The author founded, owns and operates the MotometerCentral.com website. It was initiated to educate and entertain motometer automobilia enthusiasts and collectors as well as to assist in correcting the factual historical records of these early automotive industry devices.

Mr. Clax is recognized as one of the top motometer collectors in the world with a collection made available for exhibition at leading automotive museums libraries and higher learning institutions. His collection contains a number of the oldest and most historically significant examples in existence. It is one of the most extensive and varied collections of its type, fully authenticated with a 97% or higher rate of original functionality and few duplicates.

He is an active and contributing member of the Society of Automotive Historians, the Antique Automobile Club of America, the Historic Vehicle Association and Motometer Collectors Association. He has published articles, written papers and presented at industry conferences and seminars.

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The Trailer Revolution:

The Origins of Recreational Vehicles in American Culture

Figure 1: A 1936 Airstream Clipper being towed behind a 1936 Lincoln Zephyr V-12 sedan. Photo courtesy of Airstream, Inc.

By David Burel
Auburn University

Photography and ads from the author's private collection unless otherwise noted

A sign stating "No More House Cats" immediately caught Howard Vincent O'Brien's eye on his trip to the beaches of Corpus Christi, Texas. He was used to seeing "No More Vacancy" signs, but he "decided the congestion must be extreme. Things were certainly crowded when there wasn't even room for another kitten!"[1] Upon closer inspection of the worn lettering, O'Brien discovered that rather than dealing with a lack of room for domestic felines the sign was directed at early recreational vehicles: "house cars." This was the first time O'Brien, a Chicago area

news reporter, had developed any interest in the topic of recreational vehicles. Shortly after, at the prompting of a newspaper editor and O'Brien's wife and daughter, he would begin a journey of four thousand miles in a travel trailer.[2] Like O'Brien, many others would attempt to piece together their understanding of the new trailer technology in their travels.

During the 1930s, the American public and especially those interested in travel witnessed the launch of an industry that focused on producing a new type of automotive technology, the manufactured travel trailer. Prior to this development, those interested in recreational vehicles had to produce their own or purchase an expensive custom setup. The travel trailer—mobile accommodations towed behind a passenger vehicle—became the dominant form of recreational vehicle during the 1930s. From the beginning of the decade to the onset of America's involvement in World War II, this new product and the popular demand for it cemented the recreational vehicle as a lasting cultural institution. The 1930s' trailer revolution explicitly reflected America's enthusiasm for new technologies that promise novel experiences and lifestyles. Americans' expanded desire for domestic vacations and limited Depression-era budgets fit well with the trailer industry's promises of good times at cut-rate prices. The trailer itself became an object of hope that symbolized a new technological future featuring expanded vacationing opportunities as well as the promise of new mobile lifestyles. Some forward-looking individuals even began to make fantastical forecasts that the majority of Americans would one day be living in mobile trailer housing in flexible mobile cities. Although this did not come to pass, the enthusiasm associated with travel trailers created lasting links between the travel trailer's mobility and a socially constructed belief that this mobility equated to increased freedom, democracy, and individuality. In these ways, the introduction of manufactured trailer technology during this period represents a revolution in American tourism, travel, and culture.

Today, recreational vehicle manufacturing is a multi-billion dollar industry. From the beaches and the mountains to the college tailgate and NASCAR infield, the recreational vehicle is ubiquitous in American life. It is a far-reaching cultural symbol, which many Americans spend sizeable sums of money to experience. Some choose to live in recreational vehicles in retirement, while others use them to go on vacation or to sporting events. The recreational vehicle's important role in American culture was no accident; enthusiasts and the industry built the cultural institution from the ground up.

This paper examines the history of the recreational vehicle industry and travel trailer users from 1930 until America's entry into World War II. This was a vital and formative period, a time when the recreational vehicle became a cultural institution and the definition of a recreational vehicle solidified.

The onset of the Great Depression had begun to push the majority of Americans away from autocamping, as people camping in cars became associated with homelessness and desperation. In addition, the creation of the early motel industry, which provided convenient accommodation options for those traveling by car, also helped to kill off mainstream autocamping. However, these developments did not stop recreational automobile enthusiasts from wanting to travel with their own mobile accommodations. Autocamping enthusiast groups, such as the "Tin Can Tourists of the World," began to search for a way to satisfy their desire to travel without sacrificing modern creature comforts and convenience. These enthusiasts demanded a better way to autocamp, which in turn created a new technology, the recreational vehicle. These desires would not be satisfied by the previous decade's autocamping setup, which used makeshift tents and general purpose camping gear to provide mobile accommodations. This in turn created the market conditions necessary for some entrepreneurs to become interested in mass-producing a

recreational vehicle that would suit the enthusiasts' desires. Like automobile manufactures several decades earlier, these recreational vehicle entrepreneurs were numerous and many would not stay in the business for long.[3]

By 1936, the recreational vehicle industry was beginning to leave its mark. The industry had publications interested in covering its products, and numerous books were published about users' experiences. The excitement of recreational automobility that the Tin Can Tourists had first enjoyed a decade earlier was reaching wider sections of American society.

Historical scholarship on recreational vehicles has been lacking. One of the only works on American automotive travel technology is Warren Belasco's *Americans on the Road* (1979), which sheds valuable light on the rise of the travel trailer. [4] His book presents an evolutionary story of roadside accommodations from early autocamping to roadside businesses over the course of thirty-five years.[5] Although his story intersects with the history of autocamping, Belasco's focus on roadside accommodations causes him to miss significant developments in mobile accommodations technology, such as the travel trailer.

The same is true of John Jackle, Keith Sculle, and Jefferson Rogers, who expanded on Belasco's work on early motels in *The Motel in America* (1996).[6] The trio presents an authoritative history of the motel's growth in America including its architecture, business models, and patronization. Read together, these books provide a thorough history of roadside accommodations, but very little on the technology of mobile accommodations. This paper seeks to address this gap.

More broadly, this paper contributes to a growing body of scholarship on automobile enthusiasts. Among the first of these is Robert Post's *High Performance* (1994), an extensive study of the sport of drag racing that would likely satisfy both the academic scholar and the drag racing enthusiast.[7] *The Business of Speed* (2008) by David Lucsko takes aim at the pursuit of automotive performance outside of the narrow lens of drag racing and within the everyday enthusiasts' driveway.[8] Lucsko's book shows that enthusiasts involved in a specific genre of automotive technology have significant histories that warrant scholarly attention.[9] This paper asserts that recreational vehicle enthusiasts are similar, and have an important history of their own.

Terminology

This paper attempts, as much as possible, to focus on the history of recreational vehicles, but it is important to note the ambiguity associated with trailer technology in the 1930s. The word "trailer," in American usage, has a variety of possible meanings.[10] Today, a trailer could be a recreational vehicle, a travel trailer, or an almost entirely static form of housing, the house trailer or mobile home. This confusion dates back to the era in question, as the histories of travel trailers and mobile homes run parallel to each other until the 1950s.[11] The best scholarly work on the latter is *Wheel Estate* (1991), written by a professor of public administration, Allan Wallis.[12] Wallis argues that the history of mobile homes unfolded through an iterative process as invention by manufacturers, developers and users that was negotiated with often hostile governments, regulators, and zoning authorities.[13] Ultimately, this process has made mobile homes less attractive and limited their competiveness against other housing forms. Wallis' study provides a valuable context to the development of the recreational vehicle.[14] Although they have improved in construction over the years, mobile homes have been made increasingly immobile; today, they are largely permanently installed manufactured housing.[15]

The recreational vehicle should be seen as distinct from the mobile home trailer or manufactured housing of later decades. In the 1930s, there were some considerable overlap as the industry and the government had not yet created precise categorizations.

To explain the difference one must focus on the question of mobility. A trailer without mobility, with wheels removed or foun-

dations built under it, represented nothing other than cheap static housing. The recreational vehicle users were involved in a specific type of action, "recreational automobility." Recreational automobility might best be defined as the use and enjoyment of automobiles as a major form of recreation and/or leisure travel. The term then builds on the emotional, pleasurable, and recreational aspects of automobile tourism and travel. This term is useful because it shifts the emphasis of the word "automobility" away from its traditional basis in the common conception of the automobile as a primarily utilitarian technology.

The history of the recreational vehicle enthusiast begins with the autocamping of the 1920s. Just as important is autocamping's demise during the Great Depression, which in turn pushed these autocamping enthusiasts to go further. With the end of mainstream autocamping and the rise of roadside accommodations, recreational automobility took a separate path of development. But even in the 1920s, enthusiasts themselves began to create mobile accommodations (often in the form of house cars) that could compete in comfort and convenience with the new roadside accommodations. Their efforts were realized in the first recreational vehicles. According to Mirriam-Webster, a recreational vehicle is "a vehicle designed for recreational use (as in camping)."[16] A better, more specific description might read "any readily mobile vehicle or vehicle attachment which is both roadworthy and constructed to provide shelter in support of camping-style activities." This definition allows for a little more clarity and specifically includes both the motorized house car, or motorhome, and the travel trailer, which is towed by an automobile or other road vehicle. The term "recreational vehicle" was not universal in the 1930s; in fact, as the travel trailer came to dominate the mobile accommodations scene, many would describe the activity as "trailering," and themselves as "trailerites." Our story begins, however, with the humble "house car" of the 1920s.

Figure 2: House cars were often home-built on automotive chassis and had varying levels of workmanship and finish quality. [17] Photo courtesy of www.floridamemory.com.

The recreational vehicle emerged during the first two decades of the twentieth century. Its "invention" was a gradual process undertaken by many different users modifying their own cars to suit their individual travel desires. The first type of vehicle to meet the definition of a recreational vehicle was the house car, which was popular during the 1920s. These house cars represented the first step in the evolution of autocamping as the recreational autocampers looked to improve their camping experience. As Tin Can Tourist Leroy Mills stated during the 1920s, "A few housecars, crude compartments built upon the chassis of a car or truck, began to appear among the tents."[18] They required far less time to set up for camping and usually contained at least sleeping and storage areas. These vehicles were typically homebuilt projects and were built to varying standards and sizes, with "each of these reflect[ing] the owner's ideas of craftsmanship in construction."[19] Figure 2 shows a typical house car of the late 1920s. A wooden frame was attached to the original chassis to construct the

Figure 3: A view of a Tin Can Tourist convention in the 1930s. [21] Photo courtesy of www.floridamemory.com.

house car. Pictures of the Tin Can Tourists using house cars show that no two were exactly alike, and that each had its own distinctive flair. Mills described these variations in quality and finish:

> Some were neatly constructed and painted, while one old-timer [swore] that he saw one of those individual hog-pens mounted upon a chassis and used as a traveling home. Gradually, these house cars became better built and more convenient and were quite popular with the campers. [20]

There was also no one make or model of vehicle used by early recreational vehicle enthusiasts like the Tin Can Tourists. Generally, the only requirement was an engine sufficiently powerful to propel the vehicle and a design with adequate stability for long distance travel. Another distinctive feature of the house car was that it represented a permanent modification to a vehicle.

Unlike the car-and-tent setup common among early autocampers, the house car redefined the use of the vehicle as recreational. The house car was an advanced and eye-catching piece of recreational automobile technology, but practical issues would limit its success over the long term.

One reason for this was that house cars never reached anything approaching mass-production. Instead, they remained custom-built products, which meant that they continued to be relatively uncommon outside autocamping enthusiast circles. Because the house car conversion was permanent, the opportunity cost was higher to the individual as they could not use the vehicle for its previous utilitarian transportation role. The opportunity cost for a house car conversion meant that while one gained recreational uses for the vehicle, one also sacrificed the opportunity to use the car for simple utilitarian transport. Both the lack of any concerted effort to mass-produce the house car and its high opportunity cost combined to push recreational vehicle enthusiasts to embrace another format, the travel trailer.

Ultimately, the house car was not the mainstream recreational vehicle format for the future, and it largely remained unfamiliar to the general public until well after World War II when it was reimagined by manufacturers on a larger scale as the motorhome built on a larger truck, van or bus chassis.

Therefore, travel trailers offered most of the advantages of house cars without generally requiring

permanent conversion to a single-purpose recreational vehicle. This was because the utilitarian vehicle could simply tow the travel trailer. One could now secure their trailer in camp and separate their vehicle to run errands into town or take short day trips with the car alone.

Additionally, when the trip was over those who returned home could store their vehicle in a garage or parking place indefinitely until the next recreational outing. Together the car and travel trailer were a recreational vehicle and, when separated, the car was every bit the utilitarian vehicle it had been before. This practical advantage gave travel trailers the competitive advantage in the early market for recreational vehicles, particularly in the era of limited financial resources like 1930s America.

The travel-trailer era of recreational vehicles began during the 1930s and reached mainstream status before the end of the decade. There were relatively few travel trailers constructed in the 1920s and there is little record of their presence in early autocamps.

For example, the visual record of the Tin Can Tourists does not appear to show any travel trailers prior to an image from 1931. Early travel trailers were rudimentary, especially those built before the 1930s and those built by hand. According to Wally Byam, the early travel trailer manufacturer and founder of Airstream, "the first trailers were tents on wheels."[22] Tin Can Tourist Leroy Mills also mentioned these early tent-like trailers, describing one he called the "Covered Wagon" with a rather ponderous drop down floor, canvas panels, stove, and built-in storage cupboards.[23] He described another inconvenient early set-up which required that "poles [be] placed under each corner to prevent the sides from falling off when opened and [it] took all neighbors around to operate its mechanism."[24] These early trailer tents were the forerunner of the travel trailer, but they appeared to lack in simplicity and convenience. It required the application of large-scale manufacturing of simple and well-designed trailers as well as the public's realization of the natural advantages of the trailer format to make the travel trailer a viable product in the 1930s.

Looking at the largest recreational vehicle group of the time, the Tin Can Tourists, the travel trailer clearly began to catch on as the predominant form of mobile accommodations as tents and house cars diminished in popularity. One trailer magazine commented on the direct connection between travel trailers and their popularity with the Tin Can Tourists. It suggested that their adoption had been a boon to the organization. "Each year the membership of, and interest in, the organization have grown, and especially is this true since trailers have forged to the front to replace the tents."[25]

By the mid-1930s, photographs of the Tin Can Tourists suggest that the group had almost completely shifted to the travel trailer as the recreational vehicle of choice. In 1935, the Tin Can Tourists were described as having "978 trailers, 36 house cars and 2,300 people in one camp" at their meeting in Sarasota, Florida.[26] This Tin Can Tourist meeting was made up of 96 percent travel trailer outfits, representing near uniformity among the group. This demonstrated that the travel trailer, not the house car, was the primary choice of recreational vehicle among the Tin Can Tourists by the mid-1930s.

The Launch of the Trailer Industry

The travel trailer manufacturing business became its own distinct industry by the late 1930s. The industry grew increasingly visible when specialist publishers began to discuss their manufactured travel trailers in both books and magazines. The first magazine about travel trailers was *Trailer Travel*, the first issue of which was published in 1936. This magazine later changed names to *Automobile and Travel Trailer Magazine* and eventually became part of the Woodall Publishing Company, which still exists.[27] In early 1936, it was marketed as the "only national magazine in the trailer field for all Trailerites... owners [present and future], operators, dealers and manufactures of

pleasure and business trailers."[28]

In 1937, *Trailer Travel* Magazine was joined by a competitor, *Trailer Topics*. These new publications reflected Americans' growing interest in travel trailers. Both magazines focus generally on the promotion of travel trailers, news of the trailer industry, the experience of living in trailers, and technical and legal information about travel trailers, as well as providing firsthand accounts of activities one could do while traveling by trailer.

In addition to these magazines, numerous books were also published on the travel trailer in the mid-late 1930s. The content of these books focused primarily on what one could do and where one could go with a travel trailer as well as practical advice on what to expect when on the road. These publications would help to make traveling by trailer a more comprehensible choice for Americans by telling them both where to go and how to go about getting there.

There were two chief practical concerns related to traveling by trailer for those who considered this type of vacation. One related to the difficulty of driving a car with a trailer in tow behind it. The other concern was finding parking suitable and safe for overnight stopovers as the newspaperman-turned-trailer-traveler Howard Vincent O'Brien commented:

> Well-equipped camps are available, but they are not numerous. They are in fact, comparatively rare. And candor compels me to say that the best that I have seen are not very good. In most cases they are makeshifts, hastily improvised to meet new demand, badly drained, awkwardly arranged and with sanitary equipment which at best may be called questionable.[29]

O'Brien's harsh assessment reflects a skeptical view of travel trailers, which he maintains throughout his book, but it also likely represents a fair assessment of a real lack of sophisticated support facilities. Others noted this deficiency as well. Jay Norwood Darling, in his book *The Cruise of the Bouncing Betsy* (1937), recounted numerous difficulties in finding adequate places to park his car and trailer for the night. Lack of suitable trailer parking forced Darling to park at automotive garages and even rent a motor court room simply to find a safe place for overnight parking. He believed that the future of travel trailers depended on the status of the trailer camps:

> Whether or not the trailer becomes a general practice of the average American family will depend, from now on, not so much on the practicability of the trailer itself as upon the receptive attitude of the towns, inhabitants and landowners who control the use of the land along the lanes of tourist travel.[30]
>
> Just now they are not ready to throw open wide the doors of hospitality and let you park your caravan in their front yards or obstruct city traffic by pulling up to the curb of their streets.[31]

Getting cities to admit camping motor tourism had been a problem since the autocamping days. It is therefore not surprising that these issues would continue to plague autocamping's spiritual successor. Darling concurs with O'Brien on the overall availability of camping spaces, stating that "Well equipped trailer camps, with sewer, water and electric connections are almost nonexistent; ordinary tourist camps with cottages to let are definitely hostile and the modern trailer with its manifold conveniences is a good deal in the same situation as the man who was all dressed up and no place to go."[32] The issue of where to park your trailer overnight was certainly a problem that could limit the travel trailer's growth over the long term if nothing was done to rectify the situation.

The quickest solution was the publication of trailer park locations in both *Trailer Travel Magazine* and *Trailer Topics* Magazine. These listings helped subscribers find places to stay with their trailers as they moved about

the country. The ongoing problem of trailer parking was discussed in depth in a 1940 piece in *Automobile and Trailer Travel* titled "Let's Talk Trailer Parks—It's Time" by Mabel Reed LeBourveau. [33] She believed that in some areas, such as Florida, Texas, California, Maine, and Michigan, trailer camps were beginning to rise to acceptable standards with clean and safe sites featuring full utilities. However, she also noted that many areas completely lacked this kind of trailer camp. LeBourveau's selection of states suggests that better appointed camps were most likely to be found in states with high levels of tourist activity such as California or Florida. The success of trailering depended on these locals opening up suitable trailer camps where trailer travelers could enjoy both modern camps and the full protections of the law. The trailer magazines also provided extensive listings for trailer camps in each issue. Similarly, books like Freedman March's *Trailers* (1937) published extensive lists of all the available trailer camps by state and even included a chart of the facilities offered at each national park and national monument site.[34] Although they did not completely solve the problem of overnight parking, location listings and in depth analysis in the trailer press went a long way to make traveling by trailer easier for newcomers.

The difficulty of driving a car while towing a trailer was another issue that troubled many who were thinking about buying a travel trailer. Almost every trailer book author recounted their story of their first trip with a trailer by remarking on the fear of towing a trailer on the road. But over time, they all got used to the experience. Jay Norwood Darling notes that he found very little difference between driving a car with a trailer or a car without one, "except about 15 percent increase in gas consumption."[35] He did, however, criticize some state roads with small imperfections in the road surface that caused shaking, which was then significantly amplified by the trailer.[36]

Howard Vincent O'Brien notes a similar initial fear that was followed by a nearly identical realization that the trailer was not too difficult to drive. At the end of his book, he has a question and answer session with an almost certainly fictional policeman:

> Q.—Is it difficult to drive the trailer?
> A.—No. The women folk did most of our driving, even in the heart of city traffic.
> Q.—How fast can you go?
> A.—Faster than you ought to. We reached sixty-five miles an hour and could have gone faster. Our last day's run was four hundred and fifty miles.
> Q.—How about turning and backing?
> A.—Turning can be made in a wide street. Backing requires practice, but can be done surprisingly well.[37]

He continues by explaining that the car drives well at high speeds, consumes only slightly more gas, and is very easy to connect and disconnect from the trailer. Most of the literature describing driving with a trailer follows this arc from fear to mastery. The authors usually note that the trailer does not cause extremely high fuel consumption, suggesting that trailer travel could well be relatively inexpensive.

Indeed, besides alleviating concerns over the availability of trailer camps and the difficulty of driving a car and trailer, it was widely held that traveling by trailer was extremely economical. O'Brien stated, "Meanwhile, the trailer has a long list of advantages to offset its disadvantages. First and foremost is its economy. It makes possible wintering in the south for less than the cost of staying at home in the north."[38] When O'Brien started his journey, the trailer dealer told him that there were options even to rent a trailer, but in effect, everyone who came back ended up buying it outright.[39]

In *Trailers Ahoy!* (1937) Charles Edgar Nash noted, "The lure of the trailer has made itself felt among all classes of people. The home mechanic is just as proud of his $300 rolling bungalow as the millionaire is of his $15,000 mobile mansion."[40] Authors writing about

travel trailers often noted that the price of admission for taking part in these new trailer vacations was practically only the cost of the trailer. They also stressed that the cost of a trailer was within the reach of most people. Nearly all of the manufacturers' magazine ads of the later 1930s have prices from around three hundred dollars for base models to well over one thousand for "deluxe"models. This price range made travel trailers accessible to more people, while allowing the manufacturers to build higher-end models. In many ways, the selection of different sizes and models continues on today with modern recreational vehicle manufactures having a similar diversity in sizes and prices.

Census statistics illustrate the success of the industry. The numerous manufactured travel trailer sales began to gain government attention by the late 1930s. In 1937, trailer manufacturing began to be labeled as a category of manufactured goods by the United States government, demonstrating recognition of the new trailer market's size. In 1937, trailer production stood at 18,130 units followed by a decline in 1939 to 11,782.[41] The decline connects to the economic ups and downs during the 1930s, in particular the recession that occurred in 1937 and 1938. It is also unclear exactly how trailer production numbers had looked prior to the *1937 Census of Manufactures*, but it is obvious that the industry experienced considerable growth to warrant counting in 1937. Wally Byam suggested that "more than 250,000 trailers were in use by 1936."[42] With the trailer industry producing over 10,000 units a year of goods valued at $9,712,195 and $7,890,898 for 1937 and 1939 respectively, the government had to pay attention to this new industry.

Very much like the early automobile, the 1930s saw a wide range of manufacturers entering the new market. Many of these manufacturers would not survive for many years, but some would survive and play vital roles in the post-World War II era. One example of an early trailer entrepreneur who was initially successful, but then later failed is the story of Arthur Sherman and his company, Covered Wagon. Sherman was an early entrant into the field of travel trailers, starting production in 1929. By the trailer boom of 1936, his production line was capable of producing thirty-five units daily.[43] The scope of his business can be seen in the numerous ads he purchased in both *Trailer Travel* and *Trailer Topics* during the mid to late 1930s. According to Allan Wallis the Covered Wagon trailers had a modern design, solid, home-like compartmentalized spaces, and a side-mounted door for easy access. He states, "More impressive than the design of the Covered Wagon was the method of production, patterned after Ford's assembly line. Units moved down the line, end-to-end, on their own wheels."[44] Despite this success, Covered Wagon would be a victim of a shift in consumer preferences and an economic downturn. The company's trailers were six-and-a-half feet wide, but by the late 1930s, its competitors had began to produce eight-foot-wide models that were increasingly popular. Covered Wagon would be caught trying to update their line to eight foot wide production at exactly the same time the economy turned downward again in 1938.[45] Covered Wagon advertisements would disappear from both *Trailer Travel* and *Trailer Topics* by the early 1940s.

Unlike Covered Wagon's spectacular boom and bust, Wally Byam and his company, Airstream, would start small in the 1930s and blossom into an iconic manufacturer in the post-World War II period. Byam believed that travel trailers should specifically be for vacations and not an alternative to standardized housing. "The travel trailer is a compact apartment designed to be towed by an automobile," he once said. "Its basic purpose is to provide the comforts of home to the vacationing tourist, freeing him from dependence upon transportation schedules, hotels and restaurants."[46] He also believed that trailers should be high in quality. His extensive use of aluminum in his trailers resulted in trailers that weighed less than his competitors'

steel models. This reduced weight meant lower fuel consumption for the tow vehicle and easier handling on and off the road for those using Airstream trailers. His aerodynamic, streamlined travel trailers self-consciously followed trends in aviation.[47] His company was not a heavy advertiser in this period, but he did purchase some space in *Trailer Travel*.

The case of Wally Byam proves how the 1930s represented a formative period which generated both the market for mass-produced travel trailers and motivated entrepreneurs looking to build an industry over the long term.

Trailer Futurism

In modern America, new technologies have often bred excitement and extravagant promises of a brighter future. Trailers were no exception, with many advocates speaking of how they would reshape society in the future. However, these boosters claims' should not be dismissed entirely as flights of fancy, for their ideas contributed to the success of the travel trailer industry. They also provided the conceptual vocabulary of ideas for how trailers would be marketed and used by future generations. Some authors even correctly foreshadowed the post-World War II split between the travel trailer and the mobile home

One of the most remarkable predictions is the forecast of Roger W. Babson, the founder of Babson College in Massachusetts. Babson was a businessman, and his interest in new technologies dated back to his days at the Massachusetts Institute of Technology. He felt his education there was lacking in that it "was given to what had already been accomplished, rather than to anticipating future possibilities."[48] He wrote an article that was published in the January-February 1936 issue of *Trailer Travel* titled "We'll Soon Be Living on Wheels."[49] In this piece, Babson did not mince words: "I am going to make an astonishing prediction: Within twenty years, more than half the population of the United States will be living in automobile trailers!"[50] He saw the trailer as bringing fundamental change to the mobility and freedom in American society. Babson's article is both boosterish and utopian, stressing all the purported advantages of trailer living for everyday Americans, including being able to move for employment, cheaper living costs, and no or low taxation. The pitch that trailer travel and trailer living are cheap and affordable is one of the most lasting arguments of early boosters like Babson.

Babson's influence can be seen in later publications about mobile travel trailering. Jay Norwood Darling, in *The Cruise of the Bouncing Betty* (1937), writes that he undertook his journey based on "a somewhat fantastical idea that if the whole pattern of American life was to be completely altered by this new device of perambulating penthouses, it was up to us to acquire some advance information about it."[51] Charles Edgar Nash's book *Trailers Ahoy!* directly addresses Babson's prediction: "Nearly a year ago Roger W. Babson, of Wellesley, Massachusetts, the great economist, rocked the public to its foundations when he predicted that within 20 years, more than half the population of the United States would be living in trailers."[52] He continues by providing additional evidence that Babson was not alone in his enthusiasm for a mobile American society. Nash continues, "William Bushnell Stout, former president of the American Society of Automotive Engineers, and world-famous for his accomplishments in the field of airplane design, was recently engaged in a discussion of 'mobile cities.'" [53]

Evidently, enthusiasm for the travel trailer was present within traditional automotive circles at the time. In some ways, the precedent of the automobile's transformative nature (as was becoming readily apparent by the 1930s) seemed to be spilling over toward trailer enthusiasm. As Nash recalled, "[Stout] opened up his broadside by stating that not many were aware of it, but that a large part of the population of the United States is constantly moving. [Stout] backed up Babson's prediction with a ten-year modifi-

cation, by stating that within 30 years, half of the population would be living in homes on wheels."[54] Nash added his own take stating that "Mobile homes are undoubtedly going to result, in a few years, in mobile cities, living communities which will pick their locations according to the best advantages obtainable."[55] The combination of the automobile's mobility with the trailer made mobile living possible. As soon as a trailer is permanently immobilized its ability to fulfill the dream of a mobile city is significantly diminished.

Explicit in predictions about the creation of a mobile society living in trailers was a promise of greater freedom. Trailer boosters and enthusiasts often trumpeted individual autonomy and independence as central tenet of the advantages of the travel trailer. Roger W. Babson's 1936 article presented a manifesto of these idealized images of trailers: "In the first place, as I see it, this movement on the part of our families is a natural expression, a revolt, of our people against what they apparently feel to be a condition of oppression."[56] The trailer therefore was a tool to fulfill an inherent desire to break from restrictions and mobility defeated "a condition of oppression." He goes on to break down critically the conceptual consequences of static living:

> Here are salient features of it: When a man moves with his family into a home he has the feeling that he is anchored; that he is in the grasp of his employer, to begin with. He further feels he is in the clutches of politicians. He is marked by the tax assessor and collector, and must submit to any levies made against him. He cannot be certain that the landscape surrounding his residence will remain the same from one day to another, and he has no control over the erection of unsightly neighboring structures. He must put up with objectionable neighbors, should they move close to him and cannot alter conditions detrimental to his children in this respect. [57]

Babson reinterpreted static living in terms of restraint, loss of control, and the potential for being subjected to anti-democratic forces. Lack of mobility equated quite directly to his loss of freedom, autonomy and individualism, a feeling heightened by the insecurity of the Great Depression. He concluded that there was a possible solution to these problems, and one way to regain the mobility lost in modern society: "Those of our people who have turned to rolling homes have been influenced by a characteristic feeling of Americans—resentment against oppressive taxation and a desire for independence and freedom of movement."[58] The travel trailer therefore offered a particularly powerful vehicle for mobility by retaining one's individual autonomy, freedom from oppression, and American democratic ideals. Babson reflected many ideas that became a distinct draw for purchasers of trailers beginning in the 1930s.

Charles Edgar Nash conceived of the trailer experience in a similar way. Nash's accounting of the advantages of the trailer is one of the clearest in spelling out the ideological creed of the travel trailer. "Each trailer spells home and the comforts of home. Each provides coziness and de luxe accommodations on the road."[59] He emphasized the idea that travel trailers provide mobility while not being separated from the comforts of home, suggesting that one could travel without ever having to leave home. He recounted the ubiquitous theme of thrifty living, stating that "Each permits living at a minimum of expense and with a minimum of effort."[60] He finally ended on the idea of freedom and inherent American desires to travel: "Each stands for freedom and adventure, new sights, new scenes and a new outlook on life. Each means living, instead of existing. Each is the ideal outlet for an American's love of travel."[61] Nash devoted a large section of his book to retracing the development of the travel trailer all the way back to the American Frontier and even the Native America cart con-

traption called a "travois."[62]

A conception of a mobile society, like Babson's, might have best been illustrated in a 1936 cartoon, "In Nomad's Land." In the picture, the major municipal and business structures of the town were trailers. The most interesting aspect of the picture is how it shows the serious practical flaws of a mobile city. One car and trailer arriving has an occupant inquiring "Hey, where's the beauty parlor?" Although seemingly innocuous, the question points to the complete confusion that a mobile city would have caused. If important businesses all were housed in trailers and constantly on the move, they would be extremely difficult to locate. If on the other hand these businesses did not move, then building them in trailers would simply be superfluous. Perhaps more troubling is the sign that reads "Trailerville: No Taxes, No Voting, No Politics." The seemly pseudo-anarchistic vision of the mobile city was directly in conflict with long standing institutions of American politics. How could such a town function in an American system, where residence equals representation? What kind of sense of community could be built around such transience? One man sitting nearby brought home the point when he commented, "well, sometimes I kindo [sic] wish I could vote." "In Nomad's Land" also ironically suggested the developing idea of a trailer slum. In the rear of the image away from the activity of the business and municipal trailers, there appears a series of four shabby looking trailers standing idle without any automobile. These static trailers foreshadowed the negative conception of a "trailer park" present in modern society. "In Nomad's Land" represented a mobile city taken to its reductio ad absurdum. The modern conception of a city and the physical mobility of a trailer society remain difficult if not impossible to reconcile.

Figure 4: A 1936 cartoon, "In Nomad's Land" humorously depicts the confusion that could have accompanied a completely mobile community. It was originally published in the *Chicago Tribune* and was penned by John D. McCutcheon, known at the time as the "Dean of American Cartoonists." [63]

In response to the use of trailers as permanent cheap housing, purists within the travel trailer faction felt that manufactured mobile homes should not be considered part of the recreational-vehicle community because these housing

units were virtually immobile and thus did not conform to the definition of a recreational vehicle. Airstream founder Wally Byam, the most out-spoken opponent of manufactured mobile homes as recreational vehicles, felt they detracted from travel trailers:

> "Jerry" builders found that a trailer which did not have to be subjected to the rigors of the open road could be built very cheaply, actually and truthfully "cracker boxes" with wheels under them. Most of them were too big and too flimsy to tow very far behind a car. And it would take a mighty big car to tow them. They were actually submarginal housing built without the restrictions of the building codes. They were a disgrace to the industry." [64]

Wally Byam's description of early mobile home "trailers" demonstrated this growing divide between mobile homes and true travel trailers. Byam continued:

> "And new eyesores began to pop up on the outskirts of American towns and cities, "trailer camps" not meant for trailer travelers and vacationists, but for permanent occupancy. And many of them were so disreputable and junk that trailers began to get a black eye. The high esteem that they had gained by their design was lost in the squalor of their filthy surroundings."[65]

It took some time before the two would be truly distinct products from the viewpoint of laws and public image. Like Byam, the Tin Can Tourists also associated themselves with the travel trailer and did not look to incorporate the mobile home into their group's focus. Although the Tin Can Tourists' lifestyle likely did fall somewhere in between the casual trailer vacationers and the permanent mobile home dweller, Tin Can Tourists wished to live in their trailers on a semi-permanent to permanent basis, but never wanted to live in rundown trailer parks or in totally immobilized trailers. Their yearly meetings in both Florida and the North (often Michigan) kept them constantly touring and moving in proper travel trailers. A recreational vehicle therefore was intended to be constantly travelling. Motion was the key to its appeal.

The reason that the recreational vehicle became such an important part of American society was that it temporarily allowed someone to escape to this mobile lifestyle, without truly upending one's life. One could have a traditional job, community life, and political representation by living in a fixed location for most of the year, but then have the flexibility to go on trips in a travel trailer that would let them take part in the fantasy of mobile life. As even the newly-minted trailer traveler and openly skeptical Howard Vincent O'Brien admitted, "The trailer is here to stay and it will make many changes in our way of life."[66] He believed that its most influential feature was extending the vacation opportunity of people living in cities. He stated, "No longer will the city dweller be content with short week-end trips in a crowded countryside. People of small means will find it possible to take inexpensive vacations far from home."[67] O'Brien correctly predicted that this new form of vacation travel has a great deal of potential in American society.

Rather than reshaping cities, travel trailers reshaped vacation and travel. This new form of automobile travel based on using the recreational vehicle as mobile accommodations created a clear alternative to roadside motor courts and motels. Although trailer technology failed to create new mobile cities, the travel trailer profoundly changed American tourism and travel in the 1930s. It was the recreational vehicle that would captivate enthusiast groups like the Tin Can Tourists to make their traveling activities an increasingly larger part of their lives. The 1930s launched the travel trailer as the first practical manufactured recreational vehicle that would have mass-market appeal. Although the Second World War would limit both the industry and the enthusiasts as

resources went to the wartime economy, the recreational vehicle would increase in popularity after the war in a new era of prosperity.

The period between 1930 and America's entry into World War II proved revolutionary for the future of American tourism and travel. Enthusiasts like the Tin Can Tourists finally saw a technological solution to their travelling desires become readily available through mass-production, which made taking part in the activities of recreational automobility increasingly obtainable and practical.

Despite some difficult economic times, a group of entrepreneurs entered into new manufacturing businesses and directly participated in the creation of the first mass market for recreation vehicles. Finally, the ideological components of recreational vehicle's appeal would come together in the trailer literature, which would enshrine freedom, thrift, and accessible leisure as the central tenets of the recreational vehicle creed. By the end of these pivotal years, the foundation for the recreational vehicle as a cultural institution was now assured.

Endnotes:

1. Howard Vincent O'Brien, *Folding Bedouins Or Adrift in a Trailer* (Chicago: Willett, Clark & Company, 1936), 1.

2. Ibid., 1-5, 131.

3. Nevertheless, some of those who got their start in the 1930s, including Wally Byam of Airstream, enjoyed more lasting success.

4. Warren Belasco, *Americans on the Road: From Autocamp to Motel, 1910-1945* (Cambridge: The MIT Press, 1979).

5. Ibid., 3.

6. John Jackle, Keith Sculle, and Jefferson Rogers, *The Motel In America* (Baltimore: The Johns Hopkins University Press, 1996).

7. The book was originally published in 1994. It was revised slightly and republished in 2001. Robert Post, *High Performance: The Culture and Technology of Drag Racing 1950-2000*, Rev. ed. (Baltimore: The Johns Hopkins University Press, 2001).

8. David Lucsko, *The Business of Speed: The Hot Rod Industry in America, 1915-1990* (Baltimore: The Johns Hopkins University Press, 2008).

9. Ibid., 5.

10. Interestingly, British terminology on this topic is far more precise, with use of the term "caravan" to describe recreational vehicles and the term "caravanning" to describe the activity itself.

11. Eventually in the 1950s, overall width of manufactured housing trailers became too wide for roads. At this point manufacturers had to decide to produce on one size scale or the other. This was one of many factors that finally separated the industries, which had already been diverging.

12. Allan Wallis, *Wheel Estate* (Oxford: Oxford University Press, 1991).

13. Ibid., vii.

14. It is worth noting that the term "mobile home" itself is a misnomer in that mobile homes even in the 1930s were hardly mobile and barely roadworthy.

15. Wallis, *Wheel Estate*, vii-viii. Wallis notes that "manufactured housing" is the official name for the industry today. He also notes that he prefers the term mobile home "because it conveys better than any other the basic hybrid character of the innovation and the essential basis for the conflicts it has engendered."

16. Merriam-Webster, "Recreational Vehicle," Merriam-Webster Dictionary. www.merriam-webster.com/dictionary/automobility, (accessed February 11, 2011)

17. "House car from Minneapolis at Tin Can Tourists convention – Arcadia," FL Memory,www.floridamemory.com/PhotographicCollection/ (accessed October 25th, 2011).

18. Leroy Mills, *History of Our T.C.T.*, Tin Can Tourists Scrapbook 2 Box 2, Tin Can Tourists of the World Collection(hereafter TCT), Florida Library and Archives

(hereafter FL Library), Tallahassee, FL. This history appears to have been a booklet originally, but appears as separate pages pasted in the scrapbook.

19. Mills, *History of Our T.C.T.*

20. Ibid.

21. "Tin Can Tourists convention - Arcadia, Florida," FL Memory, www.floridamemory.com/PhotographicCollection/ (accessed October 25th, 2011).

22. Wally Byam, *Fifth Avenue on Wheels* (Cambridge Press: Los Angeles, 1953), 1.

23. Mills, *History of Our T.C.T.*

24. Mills, *History of Our T.C.T.*

25. "The True Story of the T.C.T.: The Number of Migratory Members of the Tin Can Tourists of the World Estimated at 300,000—Their Aims and Activities," *Trailer Travel,* January-February, 1936, 14-15.

26. Ibid.

27. "Woodall's History and Timeline," Woodall's Website www.woodalls.com/articledetails.aspx?ArticleID=2442187 (accessed 11/30/2011).

28. *Trailer Travel,* January-February 1936. Brackets are original text.

29. O'Brien, *Folding Bedouins*, 104.

30. Jay Norwood Darling, *The Cruise of the Bouncing Betty: A Trailer Travelogue* (New York: Fredrick A Stokes Company, 1937), 15-16.

31. Ibid., 15-16.

32. Ibid.

33. Mabel Reed LeBourveau, "Let's Talk Trailer Parks—It's Time," *Automobile and Trailer Travel* Magazine January, 1940, 11, 14.

34. Freedman March, Trailers (New York: Coward-McCann Inc., 1937). He credits *Trailer Travel* Magazine as the source for most of his listings that were printed at the back of his book.

35. Darling, *The Cruise of the Bouncing Betty,* 24-27.

36. Ibid., 40.

37. O'Brien, *Folding Bedouins*, 132.

38. O'Brien, *Folding Bedouins*, 104.

39. Ibid., 4-5.

40. Charles Edgar Nash, *Trailers Ahoy!* (Lancaster, PA: Intelligencer Printing Co., 1937), 7.

41. *Census of Manufactures 1939.* (Washington, D.C.: U.S. Dept. of Commerce, 1939). No census data available for 1938. Manufacturing census data is only available for this period at irregular intervals.

42. Wally Byam, *Trailer Travel Here and Abroad: The New Way to Adventurous Living* (New York: David McKay Company, 1960), 20.

43. Wallis, *Wheel Estate*, 50.

44. Ibid., 51.

45. Wallis, *Wheel Estate*, 51-52.

46. Wally Byam, *Travel Trailer Here and Abroad* (New York: David McKay Company, 1960), 15.

47. Byam, *Travel Trailer Here and Abroad*, 15-26 and Wally Byam, "New Stream-lined Coaches Use Modern Principles: Recent Scientific Engineering in Transportation Fields Finds Expression in Automobile Travel-Coaches" *Trailer Travel* (January, 1936): 20-21.

48. "Biography of Roger W. Babson," Babson College Website, www.babson.edu/about-babson/at-a- glance/babsons-history/Pages/biography-of-roger-babson.aspx (accessed 10/29/2013).

49. Roger W. Babson, "We'll Soon Be Living on Wheels: Millions—Half the Population of the U.S.—Within 20 Years Will Be Trailerites, According to Roger W. Babson," *Trailer Travel*, January-February 1936, 10-13, 26.

50. Ibid., 10.

51. Darling, *The Cruise of the Bouncing Betty*, 9.

52. Nash, *Trailers Ahoy!*, 62.

53. Ibid.

54. Ibid., 63.

55. Ibid., 65.

56. Babson, "We'll Soon Be Living on Wheels," 10.

57. Ibid., 10-11.

58. Babson, "We'll Soon Be Living on Wheels," 11.

59. Nash, *Trailers Ahoy!*, 7-8.

60. Ibid. 7-8.

61. Ibid.

62. Ibid., 15-58.

63. Chicago Tribune, "In Nomad's Land," *Trailer Travel*, October 1936, 29.

64. Byam, *Fifth Avenue on*

Wheel, 2-3.

65. Ibid.

66. O'Brien, *Folding Bedouins*, 105.

67. Ibid.

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continued from inside front cover

Cincinnati, Ohio-based business man at the time. He reporedly paid $3,450 for this particular vehicle, some $1,000 more than the advertised list price.

"The Rauch & Lang was the Tesla of its day, both in terms of performance and price," Mr. Williams said. "That was a lot of money back then."

The car is captivating on a variety of levels, especially to modern eyes. First, the car has no steering wheel; a tiller is instead used and it is mounted to the left of the driver. Additionally, there is a seat opposite of the driver's seat that accommodates two passengers facing backward and ahead of the driver, providing a visual barrier.

The four-seater used 14 six-volt batteries, with nine positioned in the front and five in the rear. They pow-

ered an electric motor of Rauch & Lang's own design. A full charge typically took about 24 hours and provided a range of about 50 miles.

In addition to the unusual seating layout, the materials used were also curious by today's standards. In addition to the various uses of wood in the body, the fenders were actually constructed of patent leather. It is one of the many fascinating details that are lost in the faded photos and artists' advertising renderings. Seeing a vehicle like this in person is a history lesson that cannot be beaten.

As presented, the electric four-seater is now in stock restored condition. Sometime in the 1940s, the fenders were modified to accommodate larger tires; presumably because original-dimension tires were not available. The fenders were returned to their original configuration and new patent leather was used. Further, the original broadcloth upholstery was replaced with leather, which was optional in 1912. The original tufted pattern was replicated.

I think that the best part of this car's story is the family that has taken care of it for more than a century. In addition to Mr. Williams, we met his son and grandson, both of whom are as enthusiastic about this piece of their history as their ancestors. That makes six generations of one family devoted to this very special car. Mr. Williams and his family live automotive history and are stewards to a very special vehicle and a technological legacy.

-Don Keefe

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