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EDITOR'S NOTES, LETTERS and CORRECTIONS

This issue of the *Review* is our biennial effort to capture the flavor of the Automotive History Conferences through publication of papers, and abstracts of papers, that were presented. The Conference is held every other year in conjunction with the National Association of Automobile Museums (NAAM).

The Sixth Conference was held at the Studebaker National Museum in South Bend, Indiana. As was true with the Fourth Conference (Auburn, Indiana, 2002), it is most appropriate for national SAH activities to take place in the Hoosier State, as that is the Society's legal home. The Society of Automotive Historians, Inc., is a not-for-profit corporation established under the laws of Indiana. In addition, the repository for SAH's records and Cugnot-nominated books is the library of the Auburn-Cord-Duesenberg Museum. When we are in Indiana, we are truly home again.

Those who have visited the old Studebaker Museum will recall large, dark rooms crammed with vehicles side by side. The new Museum opened in November 2005 and is quite a different story; all is light and bright. The centerpiece of the two-story atrium is a simulated body drop, where a '37 sedan body is being lowered towards its chassis. On a turntable at the end of the atrium at the time of our visit sat a sparkling burgundy bullet-nose '50 Champion convertible. The walls of the atrium are adorned with blowups of cars from colorful Studebaker sales catalogues of the '30s and '40s. There are three large display rooms, one featuring Studebaker wagons, carriages, and early cars. This display includes the carriage used by President Lincoln to take him to Ford's Theater, and another built for Hoosier son President Benjamin Harrison. Later model Studebakers are found in another room, everyone's favorite being an immaculate cream '35 President convertible (not that there was anything wrong with the two-tone '31 All-Season 4-seater convertible). A curiosity was a large-windowed coupe with blue plush upholstery, a body custom-built in Shanghai and installed on a 1923 Studebaker chassis.

The basement display room shows military vehicles produced by Stndebaker and Hummer in Mishewaka, the town next door, and more Studebakers. I had quite forgotten that the '41 Studebaker President club coupe was equipped with a one-piece curved windshield. Archivist Andy Beckman and crew have done a bang-up job in capturing the essence of a local business that operated for over 100 years.

The Museum shares quarters with the Northern Indiana Historical Society (NIHS), which has set up separate displays on the history of Notre Dame University, the St. Joseph Valley, and Oliver, a maker of plows and farm tractors. These give a vivid picture of life as it once was. Prominent is a mannequin of Mrs. Oliver in the special gown in which she greeted guests on her 50th, I believe, wedding anniversary. The Oliver mansion, "Copshaholm," adjoins the Museum, a gothic pile built in 1896; think Charles Addams in white stone with red mortar. The house and its furnishings, mostly the original ones, were left to NIHS by the last member of the Oliver family to live there.

The SAH Board met in the Bendix Room where the famous Bendix Trophy is displayed in a case. The Trophy race was sponsored by local industrialist Vincent Bendix during the years 1931-62 "to encourage experimental developments by airplane designers and to improve the skills of aviators in cross-country flying techniques, such as weather plotting, high altitude, and instrument flights," according to a folder published by Bendix Aerospace. An experimental Bendix car from 1934 is on display at the Museum. The upstairs lounge at the spacious South Bend Regional Airport displays historical photos of the early days of aviation in St. Joseph County (courtesy NIHS) including the Bendix Trophy. And I might add that in the terminal's main concourse, a '62 Lark Daytona is on display. No mistaking where you've landed, that's for sure.

The Conference was structured so that the two days of presentations were separated by a free day devoted to touring South Bend or the nearby Hummer plant. As we had visited Hummer when the Board met in South Bend in 1995, six of us decided to motor, as they used to say, to Kokomo, to pay our respects to Elwood Haynes and the Apperson Brothers, pioneers of the Indiana automobile industry, if not of the entire country west of Massachusetts. Our first stop was the Automobile Heritage Museum on the outskirts of town which features at least eight Haynes and Haynes-Apperson cars, and two Appersons. Our enthusiastic guide was Don Wooldridge, an encyclopedia of local lore, whose wife is a docent there. Kokomo, surrounded by the flattest land you ever saw, has itself become the proverbial buckle on the Rust Belt, but we had a fine lunch downtown, following the Woolridges' recommendation, and proceeded to the home that Elwood Haynes built and where he spent the last ten years of his life. If you have to ask who Elwood Haynes was, see the review of two books about him at the end of this issue. His home is now a museum. Curator Kay Frazer let us behind the ropes to examine in detail the Haynes car that has been placed on the sun porch of the home. Upstairs each room is devoted to the products of local industries such as Delphi, including the room where Elwood died of heart failure in 1925, at the age of 67. Our final stop of the day's jaunt was at the monument marking the spot where Elwood first drove his "Pioneer" car on July 4, 1894. Then the road had the romantic almost novelistic name of Pumpkinvine Pike. It must be many a year since pumpkins grew there for now it is only yards away from a busy six-lane highway.

Two dinners were of particular note. The Clem Studebaker home, Tippecanoe Place, another of South Bend's magnificent piles of stone, hosted a joint NAAM-SAH cocktail hour and dinner. Two nights later, we said goodbye at the joint banquet at the Studebaker Museum. The highlight of this dinner was a talk by Dr. Bernie Kish on "Rockne: The Coach and Car." I had hoped to publish this talk and Dr. Kish seemed amenable to it at the time, but two subsequent attempts to enlist his cooperation met with silence. We adjourned with the announcement that the Seventh Conference will take place in 2008 at the Lane Motor Museum in Nashville, Tennessee. I doubt if we will see a Nash, but the Lanes are noted for their collection of cars of Central Europe, so it should be fun.

The theme of the conference was "Engines of Change—The Automobile

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Front Cover: Tooting the horn for the 1937 Studebaker (courtesy of the Studebaker National Museum)

Rear Cover: Front cover of *The Studebaker Wheel,* October 1930 (from the editor's collection)

Acknowledgments: Credits for illustrations will be found in each article or abstract.

Back Issues of Automotive History Review

Packards From South Bend: Economic Perspectives on "The Last Packards" Decision
Part 1

by Robert R. Ebert, Ph. D, and Niccole M. Pamphilis

Introduction

After facing serious corporate financial problems and sharply declining sales the Studebaker-Packard Corporation ended production at the Detroit Packard plants in June 1956. Subsequently, Packard production was transferred to the Studebaker plants in South Bend, Indiana. While the history of Packard is well-documented up to that point, what is not well documented with respect to the 1957 and 1958 models is the economic rationale behind the "Last Packards" decision. In this paper we use standard economic analysis to examine the decision of the Studebaker-Packard Corporation to produce the 1957 and 1958 Packards.

The premise guiding our research is that rational corporations operate in the best interest of their stockholders. That is, it is assumed that under ordinary circumstances firms are profit maximizers (Pindyck, 264. For a full citation of this and other works see Bibliography at the end of the paper).[1] Therefore, the question underlying our research is whether, given that sales projections for the 1957 and 1958 Packards were significantly lower than prior year Packard sales, the "Last Packards Decision" was in the best interests of the company's stockholders and other stakeholders. In raising the question of the economic rationality of "The Last Packards Decision," the examination of that question is taken beyond the anecdotal and often subjective discussion that has characterized earlier writing on the subject.

Historical Setting

The move to South Bend made that city the third city to house the principal manufacturing operations of Packard. The Packard Motor Car Company began business as the Ohio Automobile Company in Warren, Ohio, following the building of the first Packard automobile by James Ward Packard in 1899. Investors led by Henry B. Joy moved the company, then called the Packard Motor Car Company, from Warren to Detroit, Michigan, in late 1903 where it remained until consolidation in the Studebaker plants in South Bend for the 1957 model year. The South Bend Packards, that is the 1957 and 1958 models, were based on Studebaker body shells and mechanical components (Kimes, 16-89, 624-634).

Automotive Production Efficiency and Studebaker-Packard

The decision leading up to the production of the last Packards needs to be put in the context of the economics of the automobile industry of the United States as it existed in the middle and late 1950s. Economic studies of the U.S. automobile industry of the 1950s and the 1960s present convincing evidence that a fully integrated auto producer (one that builds most of its major components such as bodies, engines, etc.) needed to operate its assembly plants at the rate of 200,000 to 250,000 cars per year, or 55 to 65 cars per hour, to be efficient, minimize unit costs, and take advantage of economies of scale in assembly (White, 19-39). (In economic terms, firms seek to achieve productive efficiency - that is, to operate where costs per unit are minimized and where economies of scale are taken advantage of. Economies of scale exist in the automobile industry when unit costs are reduced by spreading the significant fixed costs of plant and equipment out over a lar, number of units.) Table 1 shows that Packard before the 1954 merger with Studebaker was not sustaining production levels that could be considered efficient in the post World War II era.

Table 1
Studebaker and Packard Automobile Production Calendar Years, 1946-1959[a]

Year	Packard	Percentage of U.S. Total	Studebaker	Percentage of U.S. Total	S-P Total	S-P Percentage of U.S. Total
1946	41,706	1.28	77,567	2.37	119,263	3.65
1947	52,273	1.03	123,640	2.44	175,913	3.47
1948	98,898	1.79	166,755	3.01	265,653	4.80
1949	104,593	1.60	228,402	3.49	332,995	5.09
1950	72,138	1.88	268,145	4.02	340,243	5.10
1951	76,065	1.42	222,570	4.17	298,635	5.59
1952	62,820	1.45	161,520	3.72	224,340	5.17
1953	81,341	1.33	186,484	3.04	267,825	4.37
1954	27,583	0.50	85,369	1.55	112,952	2.05
1955	69,667	0.88	112,380	1.41	182,047	2.29
1956	13,432	0.23	82,257	1.42	95,689	1.65
1957	5,495	0.09	67,394	1.10	72,889	1.19
1958	1,745	0.05	55,124	1.31	56,869	1.34
1959	–	π–	153,830	2.75	153,830	2.75

[a] *Ward's Automotive Reports*, selected weekly issues, 1946 through 1959.

Even the Studebaker and Packard combined outputs after the merger did not reach efficient levels of output needed in a single assembly plant. Studebakers were being built in the large South Bend facility and, through 1955, in smaller Los Angeles and Canadian assembly plants. Packards were built in the Detroit plant. A letter written by James Nance, president of Studebaker-Packard Corporation, to a Congressional Committee of the 84th Congress indicated that after the merger the firm had a production capacity of 470,000 units (U.S. Congress, 416).

The Studebaker and Packard production operations differed in one important respect. The South Bend Studebaker plants, with complete body and engine making facilities, were more integrated than the Packard Detroit plant. The East Grand Boulevard plant of Packard was basically an assembly operation that mated bodies made for Packard by Briggs Manufacturing with engines built by Packard. Bain estimated that such a relatively less-integrated assembly operation could be profitable with production of 60,000 units per year (Bain, 245). As shown in Table 2, in years when Packard sustained output of 60,000 cars or more, it operated profitably.

The Packard financial position in the late 1940s and early 1950s was complex. Robert J. Neal in *Master Motor Builders* used Packard Board of Directors meeting minutes to calculate the firm's profits or losses from auto production compared to non-automotive operations such as aircraft and marine engines. Table 2, therefore, shows the income and profits of Packard overall as reported publicly in the company's annual reports and breaks down the earnings or losses by automotive and non-automotive activities.

The picture that emerges from Neal's work is that of a Packard Motor Car Company whose financial condition was more precarious than revealed in publicly-reported data. The pre-tax profit data confirm that, when Packard produced over 60,000 cars at East Grand Boulevard, automotive operations were profitable (see Tables 1 and 2). However, the data also reveal that non-automotive profits were significant. Over the 1946 through 1956 period, Packard lost a total of $71 million on automotive operations (most losses were concentrated in 1954, 1955, and 1956) but earned $31.6 million total on non-automotive activities. While automotive profits were relatively robust between 1948 and 1952, the importance of defense business in the early and mid 1950s is evident.

After 1954, Packard production methods changed dramatically as it became more integrated in new production facilities. Faced with aging, multi-story plants at its Detroit East Grand Boulevard facilities and the realities of an aging product line based on its venerable straight-eight engine, Packard made an attempt to modernize its cars and its production facilities for the 1955 model year. The body design, originally introduced for the 1951 models, received a major face-lift. Mechanical improvements included introduction of a V-8 engine, upgrading of the company's automatic transmission, and adaptation of a new suspension system based on torsion bars.

The introduction of an upgraded product line was the occasion for upgrading Packard's production facilities. New engine and transmission plants were built in Utica, Michigan, where the objective was to achieve straight-line, continuous flow production in a single floor plant which had not been possible at East Grand Boulevard (*Annual Report*, 1954).

Additional upgrading of Packard facilities involved body production and final assembly. Packard bodies had been manufactured by Briggs Manufacturing Company since 1941. However, in 1953 Briggs sold its automotive facilities to Chrysler Corporation and Packard was faced with having to make its own bodies for the 1955 model year. As a result, Packard acquired a plant on Conner Avenue in Detroit from Chrysler under a five-year lease agreement with option to

Table 2

Packard Motor Car Company Dollar Sales and Profits 1946-1959[a]

(Millions of Dollars)

Year	Sales	Income	Auto Profit[e]	Non-Auto Profit[e]
1946[b]	$92.8	$4.8	($5.7)	$1.9
1947[b]	117.1	3.9	(2.2)	.7
1948	233.1	15.1	24.3	.5
1949	212.6	7.7	13.4	.04
1950	174.4	5.1	7.3	.3
1951	179.5	5.6	9.9	1.2
1952	234.5	5.6	7.3	5.3
1953	336.6	5.4	.6	11.9
1954	222.9	(26.1)	(48.1)	6.4
1955	482.2	(29.7)	(32.3)	1.4
1956[c]	304.3	(43.8)	(45.7)	1.9
1957	215.9	(11.1)	NA	NA
1958[d]	183.7	(13.4)	NA	NA
1959	387.4	(28.5)	NA	NA

Note: Figures in parentheses represent losses.

[a] *Packard Motor Car Company,* Annual Reports 1946-1959 *(includes Studebaker-Packard Corporation reports 1954 through 1959). The 1954 figures include Packard Motor Car Company results for the first nine months of the year and the combined results for Studebaker and Packard in the final three months.)*

[b] *"Income" for 1946 and 1947 reflects additions to earned surpluses for those years. Packard lost $3.9 million in 1946 before war contract adjustments, tax refunds, and a return to reserves held out in prior years for possible cost adjustments. In 1947, Packard earned $1.1 million before such adjustments.*

[c] *Net loss is before special charges and credit. After such provision, net loss was $103.3 million.*

[d] *Sales in 1958 reflected successful introduction of the Lark compact car in the fourth quarter. Sales in the fourth quarter of 1958 were $88,651,896 and operating profit was $3,680,574. Nine month results reflected continuation of the Packard line and larger Studebakers in 1958. Nine month sales were $92,005,696 and operating loss was $22,552,511.*

[e] *Before taxes and other adjustments; Source: Neal, Robert J.;* Master Motor Builders *(Kent, Wash.: Aero-Marine History Publishing Co., 2000) pp. 233-236.*

purchase. Body and final assembly operations were then shifted to Conner Avenue. With its engine and transmission plants in Utica and the body and final assembly at Conner Avenue, Packard became a more integrated producer for 1955 than it had been since the early 1940s (*Annual Report*, 1954, 13).

With its new facilities in operation, Packard set a goal of making 100,000 cars in 1955 (*Business Week*, Jan. 8, 1955, 121). While an integrated production system may have had the potential for making Packard more efficient, it would have required a higher level of output to bring unit costs down, given the greater overhead in the new facilities. Whereas Packard sustained profitable operations on production of approximately 60,000 cars in prior years, the company encountered substantial losses on production of 69,667 Packards and Packard Clippers in 1955 (See Table 1). The breakeven point for the Packard Clipper Division in 1955 was estimated by the company as being 84,350 cars (Minutes of board of directors meeting, Jan. 21, 1955).

A major production and cost problem for both Packard and Studebaker at the time of the merger was the direct labor hours it took to build the cars. Data on labor hours from the pre-1955 model year at the old Packard East Grand Boulevard plant have not been found. However, the start-up figures for the 1955 model year in the new Conner Avenue and Utica facilities indicates Packard was operating at a distinct labor cost disadvantage from what it had expected in the new facilities. Start ups in new production facilities are often slow but unit costs may decline over time as employees become more experienced and more effective at using the plant and equipment. This so-called "learning-curve effect" reduces the hours of labor needed per unit of output as total output increases (Pindyck, 233).

Packard did obtain a learning-curve benefit, but nowhere near expectations. For January 1955 it targeted direct labor hours of 148 hours per car but achieved only 212. By July 1955, when output of the 1955 models was well underway, the target was 91 hours per car but the actual was nearly 50 percent higher at 133 direct labor hours per car (Minutes, Aug. 19, 1955). The higher-than-targeted labor hours per Packard and Clipper car most certainly had the effect of raising unit costs above target.

The labor hours per unit at the South Bend Studebaker plants were equally troubling for the company. Direct labor hours to build Studebakers were volatile– from 90.5 hours in 1954 to 101 in January 1955 to 79.6 in April 1955 and to 128 in July 1955 (Minutes, Nov. 12, 1954 and Aug. 19, 1955). In the South Bend plants total direct hours of 90.5 and indirect of 50.4 for a total of 140.9 hours to build a car in 1954 led to a condition where the Board of Directors was told in November 1954 that, to break even, Studebaker had to gain $97.75 per car in cost reduction, principally by reducing the number of labor hours per car (Minutes, Nov. 12, 1954). In March 1955, Nance told the directors that for each added Studebaker produced per hour with no increase in the size of the labor force there was a savings of approximately two hours per car and a value to the corporation of $480 per car or $768,000 per year (Minutes, March 18, 1955). Nine months later, improved efficiencies had been achieved and Nance was able to report to the directors that productivity in the South Bend plants was excellent with a total of 96 direct and indirect labor hours per car (Minutes, Jan. 20, 1956).

After consolidation of Packard production into the South Bend plants, the Studebaker-Packard labor hours per car were as shown in Table 3. While the Packards had the highest labor content of any of the company's cars, the direct labor hours were substantially below that in the 1955 model year in the Detroit plants. In that period of time, Studebaker had been working to achieve better efficiency at South Bend. In data presented to the directors in July 1957, A. J. Porta, Comptroller of the Corporation, showed labor hours for a representative South Bend automobile, the Studebaker Commander four-door sedan. For this vehicle, direct labor content declined from approximately 65 hours in October 1956 to about 58 in 1957 and was estimated to be about 53 hours in 1958 (See Table 3) (Minutes, July 25, 1957). In the same time period total direct plus indirect hours content for the four-door Commander was reduced from 105 to 92.[2]

Table 3 – 1958 Studebaker-Packard Direct Labor Hours

4-Door Sedans	Direct Labor Hours
Scotsman	48.27
Champion	51.61
Commander	53.47
President Classic	58.0
Packard	71.72
2-Door Hardtops	
Commander	58.41
President	61.74
Packard	74.49
Station Wagons	
Scotsman	60.99
Commander Provincial	68.2
Packard	82.98
Hawks	
Silver Hawk-6	53.57
Silver Hawk-V8	55.92
Golden Hawk-V8	67.67
Packard Hawk-V8	80.29

Source: Studebaker-Packard Corporation, Board of Directors Meeting Minutes, vol. II, September 16, 1957, New York City.

Given the evidence on labor productivity at the Detroit Packard plants compared with the South Bend Studebaker plants, on economic efficiency grounds alone it appears that consolidation of Packard production at South Bend was an attractive option for Studebaker-Packard. Also, given that both Studebaker and Packard sales dropped precipitously in 1956 (See Table 1), serious overcapacity existed in both the South Bend and Detroit plants. Without the financial resources to bring out a whole new line of vehicles to appeal to buyers, Studebaker-Packard had to figure out how to survive within the bounds of its existing volume. That reality made consolidation attractive in order to improve the productive efficiency of the firm by increasing output volume and gaining benefits from economies of scale in one plant rather than tolerating inefficient operations spread out over two production facilities.

The 1956 Crisis

Low sales and production volume at Studebaker-Packard led to inevitable financial problems that, by the middle of 1956, threatened the survival of the corporation. Others have discussed the details of the financial crisis that gripped Studebaker-Packard in the 1956 through 1958 period (See Kimes, 602-634 and Ward, 197-257). The key events of the 1956 crisis are summarized in Table 4 from information contained in the Studebaker-Packard Corporation Board of Directors Minutes. Table 4 should be examined along with Table 2 which shows the annual financial results for the firm that underscore the seriousness of its problems.

By summer 1956 there were two key developments at Studebaker-Packard. One was the Joint Program/Management Advisory Agreement with Curtiss-Wright Corporation (See Table 4). As the company's financial situation deteriorated and original sales expectations for Studebaker, Packard, and Clipper cars were not being met, it became clear that banks and insurance companies were not going to extend more credit to Studebaker-Packard. Although further efforts to secure credit for the company were undertaken, it was evident by the end of January 1956, that additional financing could not be obtained on any practical basis from lending institutions or from offering securities to the general public (Harris, 228). Financial rescue finally came with the agreement with Curtiss-Wright which was viewed by the company's directors as the only reasonable alternative to bankruptcy (Minutes, May 8, 1956).

With the conclusion of that agreement came a fundamental administrative change at Studebaker-Packard. James J. Nance, President of Packard and Studebaker-Packard and one of the prime architects of the merger with Studebaker, resigned. Corporate headquarters were moved from Detroit to South Bend, and all U.S. auto and truck production of the corporation was consolidated in South Bend. The new president of Studebaker-Packard was Harold E. Churchill, an engineer by training who had been with Studebaker since 1926 and had been a vice-president of Studebaker-Packard in charge of Studebaker operations at South Bend (*New York Times*, Aug. 8, 1956, 46).

The second major event in 1956 was the ending of Packard and Clipper production in Detroit on June 25 (Kimes, 617)(Fig. 1). For two more months the fate of Packard was up in the air. As shown in Table 4, by the end of June it was clear that the Detroit Packard operations were being closed and the lease on the Conner Avenue assembly plant was being terminated. It also became evident that if there was to be another Packard, it would be built in South Bend. For example, at the July 25, 1956 board meeting of Studebaker-Packard, one director reported that Roy Hurley of Curtiss-Wright wanted auto production consolidated in South Bend. One of the critical decisions Harold Churchill faced as new president of Studebaker-Packard was what to do about Packard. At the August 6, 1956 board meeting, Churchill told the directors, ". . . one of the principal problems confronting the Corporation was what should be done about the continuance of the Packard lines" (Minutes, Aug. 6, 1956).

Development of the Last Packards

At the August 20, 1956 board meeting, Harold Churchill stated that, after careful consideration and study, he had concluded that the Packard name should be continued on an interim model through 1957. The program Churchill presented to the board was as follows:

> The 1957 Packard would be built on the Studebaker Classic chassis.
>
> The front and rear of the 1957 Packard would embody many features of the Packard and Clipper styling.
>
> The car would carry the Packard name and probably be called the Packard Executive and sell for about $150 less than the 1956 Packard Executive and $450 above the Studebaker Classic.
>
> The estimated cost for the tooling for the 1957 Packard was $1.1 million which Churchill estimated could be amortized over 4,000 to 6,000 units.
>
> The 1957 Packard could be introduced in January 1957.

After discussion and a statement from Roy Hurley of Curtiss-Wright that he supported the 1957 Packard program, the board approved it (Minutes, Aug. 20, 1956).

In October 1956, Churchill brought to the board appropriations for $1,052,074 to cover the tooling, plant rearrangement, and other incidental expenses to bring the 1957 model Packard Clipper into production. That figure was very close to Churchill's earlier estimate. The board approved the appropriations (Minutes, Oct. 4, 1956).

An important part of the 1957 Packard program approved by the board was the ability to amortize the costs of development of the car over 4,000 to 6,000 units. The major question is whether that estimate made economic sense.

Comprehensive and detailed information over a long period of time on the profits made on individual Studebaker-Packard models has not been discovered. However, in attachments to the March 20, 1957 board minutes there exists a rare insight into the company's gross profit per vehicle. The data are only for January and February 1957 which happened to be during the model introduction period for the 1957 Packards. Table 5 summarizes those data.

The gross profit per 1957 Packard was $382.55 or 146.3% of the gross profit on Studebaker cars. Clearly, then, Packard was a premium line of cars in 1957 which generated substantial profit margins for the Studebaker-Packard Corporation. Model year production for the two models of 1957 Packards were as follows: the four-door Town Sedan, 3,940 and the station wagon Country Sedan, 869, for a total of 4,809 units (Kimes, 805).

Assuming that the gross profit of about $380 per 1957 Packard was sustained through the model year, the 1957 Packard generated a gross profit of over $1.8 million which would have more than covered the tooling costs. Therefore, Churchill's estimates were accurate and the 1957 Packard was an

Table 4: The Studebaker-Packard 1956 Financial Crisis Summary

Dates of Meetings of Board of Directors	Issues Discussed
January 20, 1956	Nance announced: Inventories of cars were double the previous year. Packard and Clipper sales in December and January were seriously below projections The Corporation needs refinancing
February 27, 1956	Need $27.8 million for retooling to have common body shell for Packards, Clippers, and Studebakers Nance fears negative public relations effects of canceling tooling program Insurance companies refused added financing S-P could run out of cash in July Packard-Clipper production suspended for several weeks, to re-start on limited basis March 5, 1956 The Board discussed disposing of the Packard portion of the business
March 23, 1956	Retail sales continued to fall Unsuccessful merger negotiations were held with International Harvester, Chrysler and Curtiss-Wright (C-W) Merger negotiations opened with Ford Ernst & Ernst asked to consider three scenarios: Consolidate Studebaker and Packard auto production in South Bend Continue Studebaker production, discontinue and liquidate Packard Complete liquidation of the Corporation Robert Heller and Associates retained to study problems of S-P
April 16, 1956	Ford not interested in a merger Finance Committee reported plans developed by Ernst & Ernst not feasible without restoring dealer and customer confidence Heller report said liquidation would leave nothing for shareholders Finance Committee had consolidation of auto operations in South Bend with defense production in Detroit under consideration but would require financing
May 2, 1956	Board decided to begin implementation of Heller Program on May 7, 1956 to reduce costs and consolidate auto production in South Bend and possible liquidation of the auto business by Dec. 31, 1956, but maintain defense business in Detroit Negotiations on-going with C-W Nance and C-W Chairman, Roy Hurley, met with government officials to try to secure defense business Merger negotiations were under way with Textron Corporation
May 8, 1956	C-W agreed to lend S-P funds and enter into a management agreement with S-P C-W agreement subject to the U.S. government giving S-P a substantial amount of defense business Mercedes-Benz cars would be distributed through S-P dealers Board agreed the C-W program was the only alternative to bankruptcy or liquidation
May 29, 1956	Board approved resolutions to implement the C-W agreement
June 2, 1956	C-W announced on June 1, 1956, that it would not put the management agreement into effect because there was not a sufficient balance between passenger car and defense business
June 4, 1956	A new proposal was being worked out with C-W involving transfer of the Utica, Michigan and Chippewa, Indiana plants to C-W which would serve in a management advisory role to S-P Directors concluded an orderly liquidation was not possible By consensus, Directors agreed to a joint program with C-W Nance resigned but agreed to stay on for 30 days in an advisory role

TABLE 4—*continued*

Dates of Meetings of Board of Directors	Issues Discussed
June 7, 1956	Roy Hurley of C-W met with the S-P Board S-P Board established a special committee of key S-P employees to work out details of a joint program with C-W
June 27, 1956	Details of joint program with C-W announced C-W would lease Utica and Chippewa plants for 12 years for $25 million C-W would assume obligations for defense contracts previously held by S-P S-P's Aerophysics Development Corporation sold to C-W for $2 million A management advisory contract agreed to between C-W and S-P with C-W having an option to buy 8 million shares of S-P common stock
June 28, 1956	Board gave Nance authority to terminate the lease with Chrysler on the Conner Avenue plant in Detroit The lease on Studebaker plant in Los Angeles was terminated
July 25, 1956	Studebaker-Packard Board member J. Russell Forgan reported that Roy Hurley, chairman of C-W, recommended the continuation of manufacture and sale of automobiles in South Bend but on a consolidated basis
July 26, 1956	Forgan reported to the board that the only alternative to the C-W program was bankruptcy proceedings which would be less promising for stockholders The Board agreed the C-W program was the best deal obtainable
August 6, 1956	Harold Churchill, new President of S-P Corporation, presided Closing of the agreement with C-W

economically viable vehicle for the company to build. Also, it is evident the company did not envision the 1957 Packard as a major volume builder. Rather, it was viewed as a supplement to the regular Studebaker line of cars and trucks. Further confirmation of the South Bend-built Packards being viewed as high profit-margin vehicles was given by A. J. Porta, Vice-President of Finance for Studebaker-Packard, in comments to the board at its December 20, 1957 meeting. Porta stated the break-even point for the corporation was 103,000 vehicles, but would be 123,000 units if the Packard and Studebaker President Classic lines were eliminated (Minutes, Dec. 20, 1957).[3]

In the minutes to the October 4 board meeting the new car is referred to as the Packard Clipper not the Packard Executive as Churchill projected on August 20, 1956 (Minutes Oct. 4, 1956). The reason for the decision to call the 1957 Packard model the Clipper and not the Executive can only be speculated upon. However, the Clipper name had been associated with Packard models from 1941 to 1956 (except for 1948 to 1952) and it may have been thought that the Clipper name attached to the 1957 model would bring better public acceptance and recognition to the car.

The decision to build a 1957 Packard was made on August 20, 1956, and prototypes of the cars were shown to the dealers on August 28, 1956. A week would not have been sufficient time to design, engineer, and build prototypes. That raises the interesting question of when development work actually began on a 1957 Packard based on a Studebaker body shell and mechanical components.

The 1957 Packards as introduced in January 1957 were not the cars the Nance administration had initially envisioned. For a comprehensive discussion of the original plans for the 1957 Studebaker-Packard line, see Kimes, Chapter 31. Only a brief discussion of the ambitious plan to integrate mechanical and body components of the Studebaker and Packard automobiles can be covered here.

At the time of the merger between Packard and Studebaker the firms' products were completely different. Both Studebaker and Packard had their own engine, body, and other facilities. Nance hoped to bring about efficiencies and cost savings by having the Studebaker, Packard, and Clipper cars and even a Studebaker truck sharing a common body shell. Exterior body panels would have been different among the three car lines, but the basis of the designs would have been a body shell based on the Packard Predictor show car of 1956. As late as February 27, 1956, Nance and the board held out hope that this plan could be carried out. The cost for 1957 would have been $22.5 million to retool for the Packard and Clipper and $5.3 million for a face lift to the existing Studebaker models. Totally new Studebakers based on the common body shell were to be introduced in 1958. The total cost of the Packard, Clipper, and Studebaker programs over the 1957 and 1958 model years would have been an estimated $48.3 million. On February 27, 1956, the board was already nervous about the deteriorating financial condition of the Corporation and approved a back-up plan of only minor modifications to both the Packard and Studebaker lines for 1957 which would have cost $10.3 million ($5.3 million for Studebaker and $5.0 million for Packard). However, apparently hoping for financial backing which never came, the board also moved forward with initial appropriation totaling $2,750,000 for tooling for the more ambitious totally new Packard and Clipper program (Minutes, Feb. 27, 1956).

By the March 23, 1956 board meeting, the financial situation had deteriorated so far that one of the options the accounting and consulting firm Ernst & Ernst was asked to

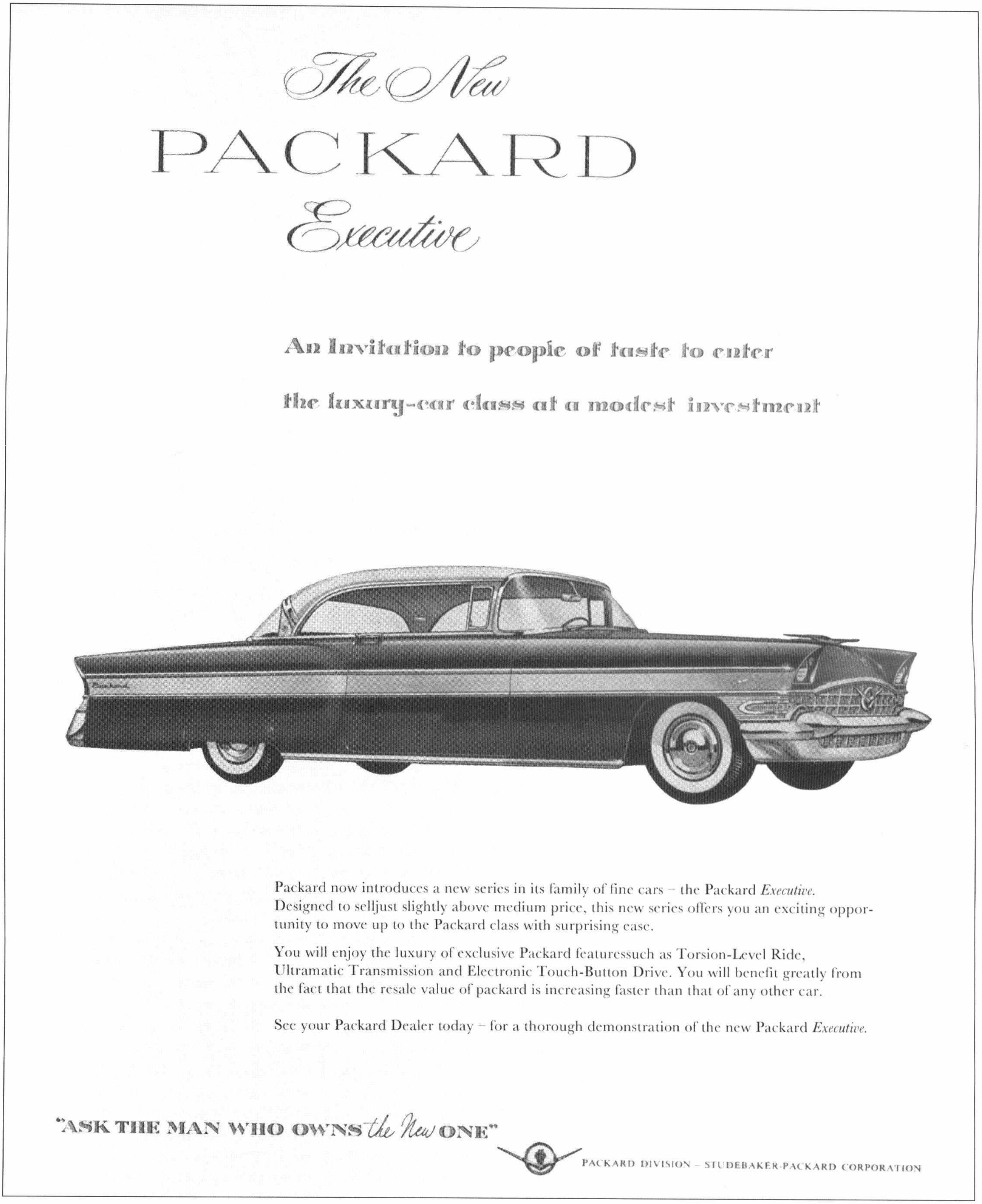

Fig. 1 – The 1956 Packard Executive. Introduced in mid-year, the Executive was representative of the last Packards manufactured in Detroit (from the editor's collection).

Table 5: Two Months: January/February 1957
Studebaker-Packard Sales and Per-Unit Profit by Model Line

	Studebaker Cars	Packard Cars	Studebaker Trucks	Total Vehicles
Unit Sales	9,740	2,800	1,848	14,388
Net Sales after allowances				
Base Price	$16,132,663	$6,233,275	$2,754,434	$25,120,372
Attachments[a]	2,264,571	987,215	342,602	3,585,388
Total	18,397,234	7,211,490	3,097,036	28,705,760
Gross Profits on Standard Costs				
Base Price	$1,575,028	$716,064	$198,494	$2,489,586
Attachments[a]	972,646	355,062	152,799	1,480,507
Total	2,547,674	1,071,126	351,293	3,970,093
Average Price (Net) per Unit				
Base Only	$1,656.33	$2,226.17	$1,490.49	$1,745.93
Total	1,888.83	2,575.53	1,675.89	1,995.12
Average Gross Profit Per Unit				
Base Only	$161.71	$255.74	$107.41	$173.03
Attachments[a]	99.86	126.81	82.68	102.90
Total	261.57	382.55	190.09	275.93
Packard Profit Per Unit as Percent of				
Studebaker Car Base	158.20%			
Studebaker Car Total	146.30%			
All S-P Vehicles Base	147.80%			
All S-P Vehicles Total	138.60%			

consider was consolidation of Studebaker and Packard production in South Bend. Another option considered was the discontinuation of Packard completely (Minutes, Apr. 16, 1956).

Given that in March 1956, consideration was being given to consolidating in South Bend, it is reasonable to suggest that at least some development work on a Studebaker-based Packard might have begun about that time. Evidence indicates that the 1957 Packards were developed in South Bend and not at the Packard styling studios in Detroit. At the time, William Schmidt was vice president for styling at Studebaker-Packard, overseeing the Packard styling studio led by Richard Teague and the Studebaker styling studio led by Duncan McRae. Although Schmidt made the presentation of the 1957 Packards to dealers on August 28, 1956, he was not the stylist responsible for the cars and neither was Richard Teague, head of the Packard studio. In an oral history of Schmidt recorded in 1984, Schmidt makes no mention of the 1957 Packards (Schmidt).

According to Teague, Duncan McRae was assigned the job of creating the 1957 Packard. Although Teague recalled going to South Bend two or three times to help with the gestation of the 1957 Packard, he believed it logical that the work on the development of the car was given to McRae because it was based on a Studebaker body (Teague, 88-89).

By June, the mechanical configuration of the 1957 Packards appears to have been set. Following a June 8 and 9 group meeting with Curtiss-Wright, including Roy Hurley, in a June 11 memo to Nance, George Brodie, Vice-President for Co-

Fig. 2 – The 1957 Packard Clipper, the first to be manufactured in South Bend. It incorporated a Studebaker body shell and many Studebaker parts (from the editor's collection).

ordinating Operations, after discussing the Studebaker-Packard defense program, stated:

> The balance of the meeting was devoted to consideration of the automotive, truck and parts programs at Packard and Studebaker. The Packard group spent the evening of June 8 resolving a proposed program which I understand would eliminate the Packard Clipper and provide for the production of the 1957 Packard and Executive models at Studebaker, using the 289 cu. in. Studebaker engine supercharged (Brodie).

So, by June 25, 1956, when Packard production ended in Detroit, planning for a Packard based on Studebaker components was well under way which means that by the time the decision to proceed with a Packard for 1957 was made by the board on August 20, 1956, Churchill knew he had something viable with which to work.

From a subjective point of view, the end result of merging Packard styling features onto the Studebaker body shell produced a fairly attractive automobile, but not a Packard in the Detroit Packard tradition nor a car that was what had been hoped and originally planned for, that is, one based on the Packard Predictor. However, McRae did manage to incorporate some styling features from the originally-planned 1957 Predictor into the resulting South Bend product. Those styling cues included a narrow stainless steel decorative strip on the side and a slight upswept cap on the rear fenders. The front of the 1957 South Bend Packards, though, resembled the 1956 models rather than incorporating a vertical grille such as appeared on the Predictor. The taillamps of the 1957 Packard were the same design as used on the 1956 Clipper and the instrument panel incorporated many of the features of the 1956 Packards and Clippers.

In late December 1956, the first South Bend-built Packards came off the assembly line (*Automotive News*, Dec. 31, 1956). The new 1957 Packard Clippers were introduced to the public on January 20, 1957 (Fig. 2). Initial sales were within expectations and, as noted above, the total for the model year was within the estimates Churchill made to the board. With that information available, and with the knowledge the Packards were high profit margin vehicles it is understandable that the company quickly proceeded with plans for 1958 Packards. At the February 28, 1957, board meeting Churchill presented an appropriation request of $3 million to cover preliminary tooling for 1958 Studebaker and Packard passenger cars (Minutes, Feb. 28, 1957).

The Packard line was expanded for 1958 to four models; the four-door sedan and station wagon were supplemented with a hardtop coupe and a Packard Hawk (Fig. 3). Initial expectations were high for the 1958 Packard line, perhaps as a result of sales of the 1957 Packards being within projections even though they were built for only about eight months. As late as the December 20, 1957 board meeting, Sydney A. Skillman, Vice-President and General Sales Manager, projected sales of 8,000 Packards for calendar year 1958, even though the model year had started out weak and projections were for a decline in Studebaker car and truck output to 74,000 units from 83,000 units in 1957 (Minutes, Dec. 20, 1957).

Fig. 3- The 1958 Packard Hawk derived from the Studebaker. Too little and too late to save Packard (from the editor's collection).

Introduction of the 1958 Packards was spread out over several months. Production of the 1958 Packard Hawk began on October 3, 1957 and the car was introduced to the public on October 15, 1957 (*Automotive News*, October 14, 1957, 56). Examination of the production orders for 1958 Packards (available on microfilm at the Studebaker National Museum in South Bend, Indiana) shows that production of the first regular Packard sedans, hardtops, and station wagons did not begin until December 9, 1957, with public introduction later that month. Therefore, at the December 20, 1957, board meeting, where Skillman made his optimistic forecast, it was still too early to tell how Packard sales would go.

Packard styling for 1958 was under the direction of then Studebaker-Packard styling head Duncan McRae. The styling featured large fins in the back, dual headlamps set in a pod on the sedans and stations wagons and a large downward slope to the hood with a wide narrow mouth air intake in place of a traditional grille. According to McRae, responsibility for the general 1958 Packard design lay with Roy Hurley of Curtiss-Wright. Hurley had seen a Ferrari on a European trip and asked McRae to incorporate that theme on a Hawk. McRae thought it was a one-off special car for Hurley, but it ended up being ordered into production as the Packard Hawk with its design themes spread across the whole Packard line (Kimes, 630-631).

While the design of the 1958 Packard Hawk is usually attributed to McRae as the corporation's chief stylist, there is some evidence the actual styling of the car was the work of another stylist in the studio. According to Virgil Max Exner, Jr., who started work as a designer at Studebaker-Packard in October 1957, the Packard Studio at the time consisted of himself, Del Coates, and Emil Bocade. Exner claims that the controversial Packard Hawk front end which was produced in fiberglass was the work of Del Coates (Exner).

For 1958, the Clipper model name was dropped and the line was known simply as Packard. Mechanically, the 1958 Packards were similar to the 1957 models except that only the Packard Hawk had a supercharged engine. The sedan, hardtop, and station wagon were not supercharged but had the 289 cubic inch Studebaker engine.

The 1958 Packards did not sell well. Sales did not equal the 1957 level and were far below Skillman's projections of 8,000 cars. Production records indicate the following breakdown of 1958 model year Packard output:

4 Door Sedans:	1,200
4 Door Stations Wagons:	159
2 Door Hardtop:	675
2 Door Hawk:	588
Total 1958 Packard Production:	2,622

The entire 1958 model year turned out to be a difficult one for Studebaker-Packard. The financial losses continued even though the company increased its market share slightly in an automobile market dominated by declining sales and an economy in recession (See Tables 1 and 2).

Throughout the 1958 model year, the board and Churchill were considering a reduction in the number of models the company offered. Plans were underway to introduce the compact Studebaker Lark for the 1959 model year. Even before the full line of 1958 Packards had been introduced to the market, there was some discussion by the board about the future of Packard. The first hint of what would come was from board member Hugh J. Ferry, a former president of the Packard Motor Car Company, who stated at the November 1957 board meeting that "the Corporation should give serious consideration to discontinuing the Packard line in 1959 if sales of that particular line are not improved" (Minutes, Nov. 15, 1957).

As plans for 1959 evolved, Churchill presented some alternatives to the board in February 1958. One plan was to reduce the number of models offered from 18 to 14 by dropping the Packard line in view of the low volume of Packard sales. He stated that without the Packard the proposed tooling bill for the regular Studebaker 1959 line was $3,251,000 and with the Packard it was $4.2 million. Changes to the Studebaker-Packard line would have included new front sheet metal, fins, tail lamps, cowls, hard and soft trim, and new instruments (Minutes, Feb. 24, 1958).

The second option Churchill presented was to drop the larger Studebaker and Packard lines. The company could then concentrate on a new 108.5-inch wheelbase compact car and the Hawk. Byers A. Burlingame, Comptroller, stated that with the absence of larger, higher profit margin Packards and Studebaker Presidents, the breakeven level for the company would rise to 121,000 units (from 103,000 in 1958). Tooling costs for only the 108.5 inch wheelbase car were modest at an estimated $5.8 million. The directors approved a preliminary tooling appropriation of $400,000 for the new model (Minutes, Feb. 24, 1958). On April 24, 1958, the directors authorized an additional $5,265,061 to tool a two-door sedan, four-door sedan, and a two-door hardtop on the 108.5 inch wheelbase. The board discussed the deteriorating situation of the corporation, concluding that regardless of the decision which might be made regarding future operations, there was no reasonable alternative except to proceed with the tooling program (Minutes, Apr. 24, 1958).

Before the compact Model X could be introduced to the pubic as "The Lark by Studebaker," a major financial challenge had to be overcome. In 1959, a large amount of debt had to be paid back by Studebaker-Packard Corporation. Bank credit amounting to $29.7 million was due on June 2, 1959. Insurance company loans totaling $25 million had to be paid off in annual installments of $1.4 million beginning October 1, 1959. At the June 18, 1958, Board of Directors meeting, A. J. Porta, Vice-President of Finance, stated that the cash position of the company was deteriorating to the point where if trends continued the corporation would have only $9 million left on December 31, 1958, hardly enough to meet its obligations (Minutes, June 18, 1958).

The directors agreed to a complex refinancing program in the summer of 1958 which was approved by the shareholders on October 15, 1958. In a letter to shareholders asking approval of the plan Harold Churchill stated: "I believe this plan is not only the best that can be obtained or developed at this time, but is one which has a good chance to put your company on the way back to profitable operations. *Without this plan the chance of restoring any real value to your stock is practically*

Fig. 4 – The 1959 Studebaker Lark, which replaced larger cars in the Studebaker line (from the editor's collection).

nonexistent." (Churchill) The plan can be summarized as follows (Proxy Statement and Minutes, May 8, 1958):

1. Debt would be reduced from $54.7 million to $16.5 million as banks converted existing debt into $16.5 million secured notes, and preferred stock convertible into 5,500,000 shares of common stock at $3 per shared after 2 years.
2. Introduction of a new smaller car to be sold with the Hawk, trucks, and Mercedes-Benz vehicles.
3. An acquisition and diversification program aimed at bringing earnings into the company to utilize its $100 million tax loss carry-forward credit.
4. Termination of the Management Advisory and Stock Option Agreements with Curtiss-Wright Corporation and purchase by C-W of the Utica and Chippewa plants for an additional $2,000,000 in cash.

The plan worked! In 1959 Studebaker had a year of optimism and achievement unknown since the early 1950s. It seemed that everyone was a winner. Certainly the shareholders did well. From a low of $2-5/8 per share in 1958, Studebaker-Packard stock reached a high of $29-1/4 in 1959. That rise in value of the stock meant the risk that banks had taken in agreeing to the refinancing plan (where they could convert preferred stock into common stock at $3 per share) paid off in huge profits for them as Studebaker-Packard stock approached $30. Workers benefited from an increase in employment at South Bend from 7,000 in 1958 to over 8,000 in 1959. In addition, they worked regularly with no layoffs and even enjoyed some overtime. Table 1 shows that a $29 million profit was earned by the company in 1959. That was the only year between 1953 and 1966 that the automotive division operated at a profit (Studebaker Background).

The 1959 results at Studebaker were achieved because of the success of the compact Lark which was offered in five models for the 1959 model year. The four-door, two-door, and two-door hardtop were built on a 108.5 inch wheelbase while the two-door station wagon and four-door taxicab were on a 113-inch wheelbase (Fig. 4). Larks were available with either a 170-cubic inch six or 259-cubic inch V-8. Larks came in either Deluxe or Regal trim (except the hardtop in which Regal trim was standard equipment).

Studebaker did not discourage the notion that the Lark, called a "New Dimension in Motoring," was an all-new car. In its advertising the Lark was referred to as "an automobile as fresh and new as the first breath of spring." In fact, the Lark was one of the most ingenious major facelifts in automotive history. Faced with a cash shortage and a tooling budget of only $5.8 million Studebaker essentially repackaged the 1958 Commander/ Champion line.

The excitement surrounding the development and introduction of the Lark as well as the news of still another financial reorganization for Studebaker-Packard came after a significant event in automotive history. On July 13, 1958, Studebaker-Packard Corporation announced the Packard line was being discontinued and the company would concentrate on compact cars (Ingraham, 1)(Fig.5). Production orders show that the last production Packard automobile was built in South Bend on July 25, 1958. It was a blue four-door sedan.

In Part 1 emphasis has been placed on the costs of developing and then the level of production of the 1957 and 1958 Packards. To develop and build cars is one thing. To sell them is another. We raise the question, then, in Part 2 of whether a serious attempt to market Packard cars in 1957 and 1958 occurred through advertising and through the dealer network.

(to be continued – footnotes will be found on page 40)

Packard is Dropped After 59 Year

Once-Famed Quality Auto Bows to Move to Smaller Models

By JOSEPH C. INGRAHAM

Packard—one of the most illustrious names in automotive history—will disappear from the American motor market this year.

The Studebaker-Packard Corporation has decided to drop the line, once the symbol of prestige among car owners, because it believes its "destiny is tied to smaller cars." This segment of the mark...

A Packard of 25 years ago, showing distinctive radiat

...its new "compact" surge after World War II fai

Fig. 5 – The death of Packard, as reported in The New York Times, *July 13, 1958* (from the editor's collection).

American Runabouts Abroad

by Arthur W. Jones

Introduction

This is an account of the first efforts of the American automobile industry to enter foreign markets.

In 1951 the writer and a high school chum stepped onto the pier at Southampton. We collected our black-and-gold three-speeds at the Raleigh factory and were off for a summer on the highways of England and France. Still under wartime trade restrictions, England in the '50s was a living museum of motorcars of the '20s and the '30s. In France the long straight roads of the Loire valley were all but empty. Many of the smaller chateaux were still in private hands but the Blue Guide said, if you rang the bell, visitors would be admitted to the grounds. On one such occasion, the concierge responded to our call but asked that we wait for a minute since the owners were about to return. Soon a small black sedan appeared, the chauffeur paused while the wrought iron gates swung open and the car proceeded up the crushed stone drive. What was the owners' car? A fine old Hotchkiss berline? A Panhard Dynamic trailing its pale blue haze? No, it was a 1936 Chevrolet Master Deluxe, looking and sounding as though it had left the factory that very afternoon.

The Chevy was a conservative choice, to be sure. This automobile, manufactured in Detroit, assembled in Antwerp and sold from a Paris showroom, did not carry the panache that later generations have awarded to classic marques of the period. It was, however, tasteful and modern in appearance, long lasting and lively in performance and of a size capable of carrying five passengers in relative comfort.

On the eve of the Second World War, annual worldwide production of motor vehicles had reached 5,000,000., a level it would not again reach until 1948. America accounted for approximately 80 percent of the total, the rest of the world for 20. American production was the sum of three components: American vehicles built in the continental United States, U.S. cars shipped knocked down for assembly in foreign plants and U.S. brand cars produced in Canada by subsidiaries of the American companies. We should correctly refer to it as the North American car since it was essentially the same product wherever produced. At that time, the export of American motor vehicles accounted for between 10 and 12 percent of production, a range maintained for many years. The significance of this can be appreciated when it is realized that, in areas outside North America, American-type cars held approximately 30 percent of the total market.

Earliest Exports of Motor Vehicles From the United States

The award for being the first in America to sell a motor vehicle outside the United States must go to the inventor Elijah Ware of Bayonne, New Jersey, who in 1866 shipped one of his steam-powered wagons to a clergyman of Prince Edward Island in Canada.[1] Some historians have claimed that this transaction was the first sale of an American car to any buyer. Many years later, an experimental steamer built by Ransom E. Olds was the subject of an article in Scientific American. It was purchased in 1893 by the Francis Times Company of London and shipped to its Bombay, India, branch but history does not tell us if it reached its destination or, if it did, what use was made of it. In 1896, the Duryea Motor Wagon Company sent some of its cars to England to compete in the Emancipation Run to Brighton and, when their good performance had been demonstrated, tried to arrange for their manufacture under license, but was not successful.

In the early years of the industry, the horseless carriage was newsworthy and attracted frequent notice in the popular press as well as in the new automotive journals. The first advertisements for cars appeared at this time, although not all of the advertising manufacturers were in a position to fulfill the hoped-for demand for their products. With nationwide dealer organizations still years in the future, many buyers communicated directly with the factories and ordered their cars for delivery. A memorandum of the Locomobile Company, dated 1901, stated that half of its sales were made through company agents and half directly to customers.[2] Until export agents had been appointed, many sales to foreign owners may also have been made in this way.

Surviving records do not reveal the numbers and destinations of these early export sales. The U.S. Bureau of Foreign and Domestic Commerce, predecessor of the Department of Commerce, included horseless carriages with the totals for conventional carriages until 1901. From 1902 to 1906 motor vehicles were counted separately but statistics were given in terms of dollar value rather than units. In later years wealthy owners often took their cars to Europe for summer touring and the export and import of these cars may have been included in trade statistics. Nevertheless, assumptions can be made for the extent of the trade. Contrary to popular belief, America was from the first years of the century a net exporter of motor vehicles. There were few De Dietrichs to be seen on the streets of Des Moines or Detroit. French luxury cars such as this were an Eastern fashion. Their style and the exploits of their wealthy owners made good press and it has therefore been assumed that these models dominated the market but this was not the case. For every big four-cylinder car that arrived on our shores, many little Yankee singles went the other way. The first year America imported more automobiles than it exported was 1958.

The decade of the 1890s, when the fledgling motor industry was barely underway, witnessed the creation of several combinations to control the manufacture and sale of motor vehicles. The speculator Harry J. Lawson formed the British Motor Syndicate Ltd. to purchase rights to the Daimler patents and thereby dominate the new industry in England. In America, the Electric Vehicle Company joined with the Albert Pope interests to offer vehicles with every system of propulsion. The Company later purchased the Selden patent and formed the Association of Licensed Automobile Manufacturers (ALAM) to control and extract fees from vehicle manufacturers. Knowing this, we should not be surprised to learn that the American automobile industry was at this time also the target of an attempt to dominate its export trade by a bold financial intervention.

On December 29, 1898, the *New York Sun* printed the following announcement:

AMERICAN MOTOCYCLES FOR EUROPE

The Fisher Equipment Company of Chicago today contracted to furnish $1,000,000 of electric vehicles to be sold in Europe in the next ten years. Count de Jotemps, of Paris, president of the American General Motor Agency, of Paris, organized the deal for his company. The count arrived in Chicago this morning, and left for Boston this evening. He will sail for Europe on Tuesday. During his visit to America the Count has also closed contracts with the Holyoke Motor Works, the Stanley Company, and the Overman Wheel Company to furnish 1,000 vehicles a year for ten years to his company. The Massachusetts factories are to turn out steam, gasoline and petroleum motors, while the Chicago concern will manufacture electric motor cycles, or horseless carriages, to cost about $1,000 each. Among the stockholders in the Paris company are Albert Geiger, a Boston capitalist, and the Duke of Milton. Count de Jotemps married a Mrs. Bennett, of New Haven, Conn., several years ago and with his bride acquired an immense fortune. He says that his company will open its Paris offices on the Champs Elysees, on March 15th, and will soon establish branches in London, Berlin, Vienna and Brussels. His company has a capital of $2,000,000. The first shipment of vehicles from Chicago will be made in January.

In later interviews with the automotive press, the Count was more conservative in describing the extent of his undertaking, reducing substantially his earlier claim as to the number of vehicles he had ordered for immediate delivery. However, the Stanley brothers confirmed in March that, of their initial batch of 100 vehicles in production, 50 were reserved for Paris.[3] They had been in discussions with Jotemps for several months prior to his visit. In the early days of the automobile industry, and especially in France, public acceptance and manufacture were expanding at a fast pace. It is easy to understand how an entrepreneur might believe that the opportunity was there and with a bold strike take advantage of the moment, especially one who may not have had experience in the motor trade. There were few who had.

Jotemps could not have made a more inauspicious choice of business associates. The Fisher Equipment Company of Chicago was the manufacturer of an electric car designed by Clinton E. Woods, for whom the Woods Electric would be named. The company lasted one year and produced but 60 vehicles. The Holyoke Motor Works had been newly organized to build gasoline cars that were to be designed by Charles Greuter, who many years later served as Chief Engineer of Stutz. Few cars were built and the company closed down in 1903. The Overman Company, initially formed to build gasoline cars, produced a conventional steam runabout, the Victor, in small quantities for three years until its absorption into the Locomobile Company in 1902. And the Stanleys were to sell their firm to New York investors six months after the Count's visit.

Locomobile Abroad

F. E. Stanley and his family traveled to Paris in June to meet with the Count and his associates, to demonstrate their car and to experience the thriving automobile culture at its source.[4] On the trip they represented the interests of the Locomobile Company of America, to whom they had recently sold their business. Prior to their visit Jotemps had joined with other investors to organize the American Automobile and Motor Company to serve as agent for the sale of American cars in England and France. It was intended that this firm would offer the new American steam cars but changes were afoot at the company's headquarters and Stanley's new owners had other ideas.

When John Brisben Walker and Amzi Lorenzo Barber incorporated the Locomobile Company of America in June 1899, they had already purchased the Stanley brothers' automobile business earlier in the spring, acquiring the factory, cars and material in process of manufacture, and all patents and applications for patents pertaining to the steam car. Shortly thereafter Walker left and the officers of Locomobile were A. L. Barber as president, LeDroict L. Barber, his son, as vice president and Samuel T. Davis, his son-in-law, as treasurer and general manager. The majority of the stock was retained by Barber and his family with a small number of shares allotted to trusted associates. The Barber family, therefore, held total control. Operating funds were secured through bank loans and the company avoided the stock dilution that led to the expulsion of founders that occurred at many of the early manufacturers.[5]

The establishment of an effective sales organization for American automobiles in the European countries was a task that had not previously been attempted. The concept of assigning European distribution rights for the cars to another entity did not have appeal and the Locomobile Company of America took steps to set up its own sales branch in London. Offices and showrooms were taken at Sussex Place, South Kensington, from which agents were appointed in the major towns, five by November 1900, with more promised. Barber and Davis made frequent trips to England and the continent and remained thoroughly involved in every detail of the export operation. The Locomobile executives realized that, in the future, they might need to form an English company to conduct the business there. During the year they had engaged an Englishman, Edward Joseph Halsey, to represent them. It is not known what credentials Mr. Halsey brought to the assignment but his supposed ability to connect with persons of influence was considered important (Fig. 1). Samuel T. Davis, a Locomobile executive, wrote in January 1901 that "Halsey is, to use his expression, overwhelmed with the possibilities of the business here. I do not think he, or anybody but a very strong man both financially and socially, would be able to float, at the present time, a company such as we would desire to handle our business."[6] Davis' concerns were prophetic, as will be seen.

For day-to-day operations, Halsey was not the man. Davis recommended an active young American who had been trained

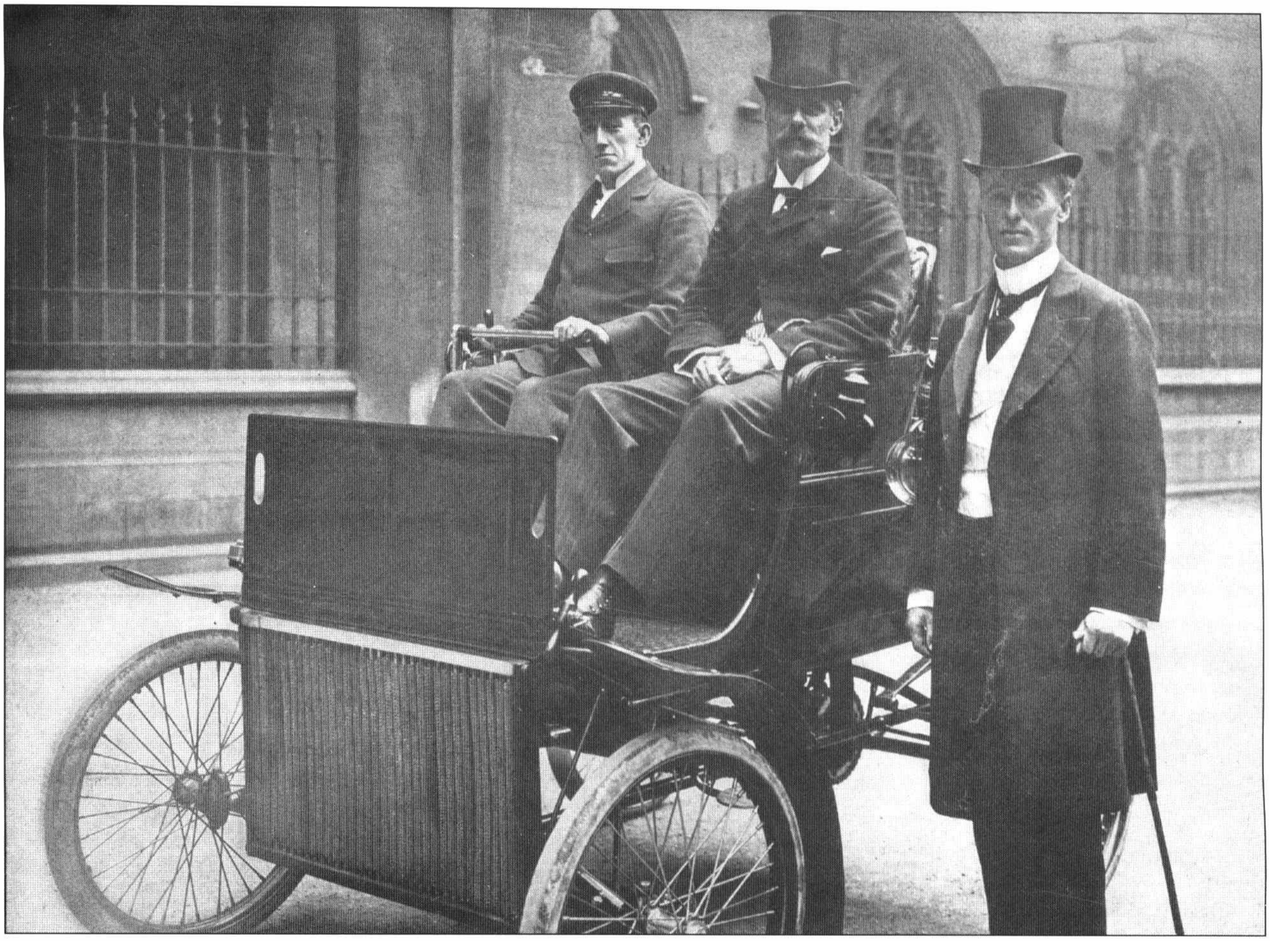

Fig. 1 – Sir John Dixon Poynder, MP, in his Locomobile in the court of the Star Chamber of the House of Commons, 1902. Sir John was one of the many aristocratic purchasers of the car (photo courtesy of Malcolm Jeal).

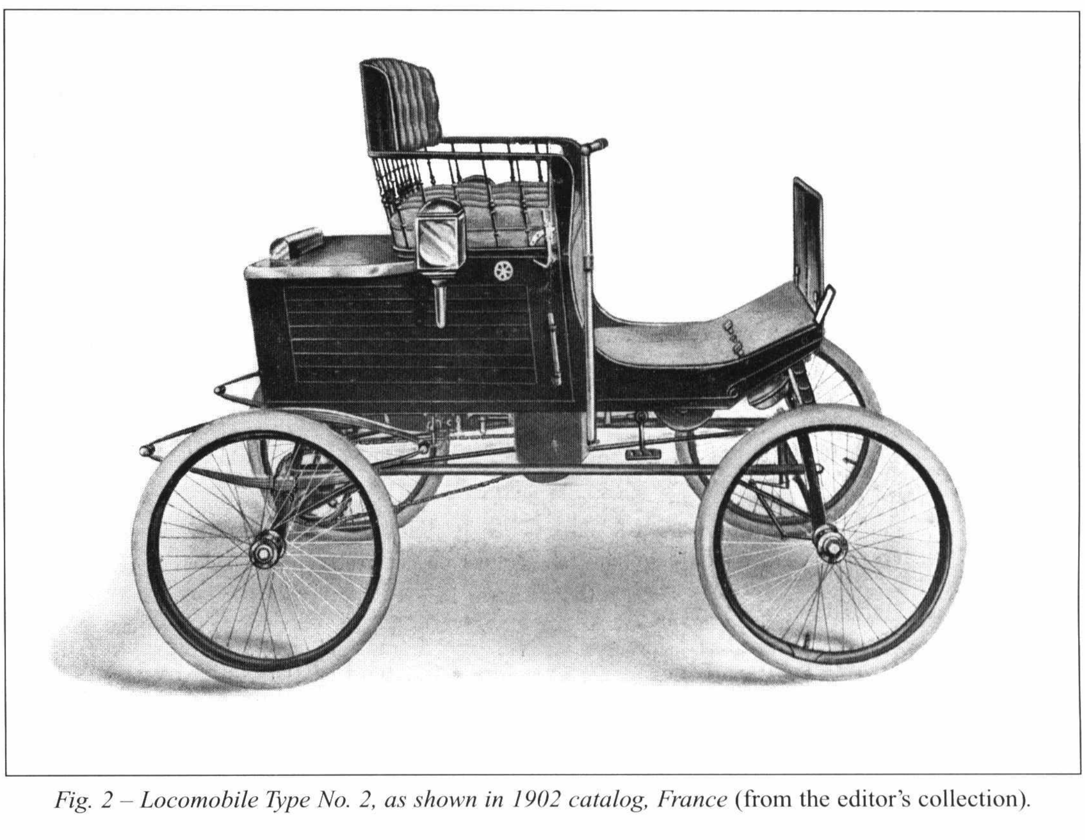

Fig. 2 – Locomobile Type No. 2, as shown in 1902 catalog, France (from the editor's collection).

in their methods to take charge of the management of the business, appoint agents, run the repositories and have general supervision. The man chosen was Arthur T. Robinson, who arrived in London shortly. By June he reported on the impossibility of conducting the London office on an economical basis under the existing system.[7]

The American Automobile and Motor Company had been registered in London in March 1899 and Barber and Davis initially acquiesced in retaining it to conduct their business on the continent. There were problems whose reasons we do not know. By January 1901 Locomobile was negotiating with a new agent for Germany, stating that "the Ammotar Company has done us so much harm in Europe that it would not be advisable to go into an important country like Germany except in a proper way; whatever we do the carriages must be looked after most carefully and given a good start."[8]

Also in Belgium Locomobile representation had not gone well and a new agent had to be appointed in 1901. Davis reported to Barber, "You will recollect that this is the country where Botari spent most of his time and did us the most harm." The new agent, Mayer & Co. of Antwerp, was confident that with a little time they could overcome the prejudice against Botari, who was now a fugitive from justice. It was probable that in only a short time he would be jailed.[9] New agents had also to be found for France (Fig. 2) and Austria and, it appears, the entire organization that had been set up by American Automobile and Motor Company was abandoned. The company, whose only business may have been the representation of Locomobile, was dissolved at the end of the year.

These complications occurred at the beginning of 1901 when the Locomobile achieved sales leadership in the American market and which was also its most successful year internationally. The company's new factory in Bridgeport, Connecticut, was coming on stream but cars were often in short supply. Agents in Portugal and Glasgow complained that their orders were not being filled. The company adopted a policy of giving preference to foreign orders but still some were disappointed. The Locomobile Company of Great Britain was formed with Robinson as managing director to bring in additional capital through a stock placement.[10] Investors were given preference shares but financial and operating control was retained by the parent firm. Sales were strong and a young man with previous experience in the motor trade, William M. Letts, was brought in as sales manager. He did an admirable job, finding opportunities to demonstrate the car's performance and keep it in the public eye, and was later promoted to general manager. Letts was to become an important figure in the American automobile trade in England. Halsey was kept on as chairman of the board to avoid the embarrassment and negative publicity of having to discharge him.

It seemed for a short time that the light steam car, an American specialty, was on its way to achieving market domination. Reports submitted by company representatives filed from various European cities stated that more Locomobiles were to be seen than any other make and only the De Dion was offering a light vehicle in competition. The French make, while well received over many years, was more costly and sold in smaller numbers. Historians have estimated the total production of Locomobile steamers over the period 1899 through 1904 at 5,200 vehicles. Letts later claimed to have sold almost 1,000 in the British Isles. Although records have not survived, it is reasonable to assume that between 1,200 and 1,500 cars were absorbed by the foreign market.

Nevertheless, interest in the product waned after the 1901 season and few were sold after 1903. In that year the decision was made to close down the recently-formed British company, presenting the difficult choice of whether to allow it go into bankruptcy or to purchase the preference shares held by the British investors. A. L. Barber felt strongly that the latter course should be followed in order to protect the good name of the Locomobile in the business community and this was done. Again the issue of Mr. Halsey came up when auditors discovered that he had been taking large commissions on cars and replacement parts in excess of his salary. Although he had been placed under contract when hired, there seems to have been a lack of clarity in that agreement and he had run up a substantial debt to the company, or so management believed. We do not know how this dilemma was resolved but it points up again the informal and ineffective way in which the business had been conducted.[11]

In later years the automotive press was to speak of the deficiencies in the first American cars sent to the international market and report how future exporters had to overcome a prejudice against them. If this had been reported by foreign papers we might be tempted to assign it to chauvinist attitudes but it was equally spoken by American commercial attaches who were attempting to advise the manufacturers of sales prospects around the world. Names are seldom given and certainly Locomobile was not the only relevant party, but the performance of the little steamer must receive a major share of the blame.

The appeal of the car to the first-time buyer must have been strong. The magic of its all-but-silent operation and the simplicity of driving could be demonstrated in a brief run. That test drive might frequently have been the prospect's first ride in a horseless carriage. He perhaps did not experience the rigor of firing up and getting the car underway or the messy periodic maintenance that was required to keep its performance up to demand. He may have read the three-part story in *The Autocar* of its triumphant 900-mile run from John O'Groats to Land's End. The editor did not tell him that the driver, Mr. Egerton, was connected with the Locomobile Company and that the car was barely in operable condition on arrival.

Montagu and Bird have described in detail the technical problems that gave early Locomobile owners such difficulties. Among them were the vital necessity of keeping the water feed level accurate to prevent damage to the boiler, the difficulty of lubricating the driving mechanism which was exposed to road dirt and the overly simple design of the burner which made use of highly flammable gasoline rather than the kerosene used in some other contemporary steamers. Their judgment is that "it came on the market before it was sufficiently developed to be entrusted to the ordinary customer."[12] Owners with a mechanical bent rose to the challenge and wrote in numbers to the automotive press enthusiastically praising their mounts, one signing himself "Locomaniac." A more sober appraisal was that of A. L. Barber who, in a letter of May 1903 assessing the prospects for saving the British company, recommended that "if the factory is sure to furnish a steam car that will suit the requirements of this market no later than next spring, the business here better go on. A good long distance steam car will find quick and large sales."[13] It was not to happen and the company was dissolved that summer.

Papers prepared in 1903 in connection with the renegotiation of outstanding debt throw some light on the financial condition of the Locomobile Company at the moment when it was completing its transformation from a steam car to a gasoline car producer. Among liabilities were the fact that British investors had to be paid off. Overman steam cars and other inventory were sold at the best obtainable prices. Patent rights that had been carried at a valuation of $307,000 were written down to $50,000. George E. Whitney, the company's chief engineer, agreed to the cancellation of future payments for the use of his patents, which were no longer of value. An attempt to raise new capital through the sale of preferred shares was not successful and the owners saw their substantial investment vanish in the face of continuing operating losses.[14]

Losses sustained in foreign trade were a significant element in the negative returns. The cost of doing business at a distance through agents whose performance could not easily be monitored demonstrated that this department could not be a source of easy profits. The practice of selling through a factory branch meant that the value of cars was carried by the company until delivery to the customer, tying up operating capital in inventory. The executive who prepared the financial report noted that "the new gasoline machines showed a handsome profit, that even if you were not able to fill all orders, there ought to have been some profit, and it would be a satisfaction to me to know if there is any profit at all in the business or whether it is run at an absolute loss."[15]

Enter the Curved Dash Olds

At the moment when the light steam runabout was rapidly losing the confidence of the motoring public, another small American machine appeared in the international marketplace. In February 1902 the first Oldsmobile Curved Dash Runabout was imported to England by Frederick Wells Peckham and displayed at the Motor Show in the Agricultural Hall. The Oldsmobile Company of Great Britain Limited was formed in June with Peckham holding 1,000 of the 3,000 shares, the balance held by Pedro Juan de Galindez, his brother Joaquin de Galindez, and other members of their family.[16] Peckham was appointed managing director and the other investors may have been brought in through his efforts. The English firm may have been the first foreign Oldsmobile agency but there were already prospects throughout the world for a vehicle that was arousing considerable interest. This was not the company's first foreign sale; the purchase of a curved dash is recorded in Australia in 1901 and the 30th example produced was shipped to a customer in Ontario in July of that year.[17]

Peckham's attempts to publicize the car by entering it in competitive events were not successful. In September he entered the Six-Day Reliability Trials where the press noted the silent running of his machine, but was forced to withdraw when he broke down and failed to complete the first day's run.[18] A Locomobile piloted by William Letts took honors in the class. In October Peckham attempted a hill climb but was defeated when his car's rawhide pinion teeth were stripped.[19] The Olds was clearly not ready or not suitable for this popular style of promotion.

Nevertheless, the elegant little runabout almost seemed to sell itself and quickly outstripped the sales of the Locomobile. By the end of 1902 Oldsmobiles were said to be "rapidly becoming one of the favorite cars in Europe." *The Autocar* referred to the car as "the well known Oldsmobile." A shareholders' report for January 1905 states that 730 machines had been exported in 1903 and 1,061 in 1904.[20] Production of the model peaked in 1904 but may have been sustained in later years by foreign sales. Of the total 13,000 curved dash and other single-cylinder variations produced, somewhat more than 3,000, or approximately one quarter of the total, were exported.

The Oldsmobile Company of Great Britain also held agencies for Winton and Baker Electric cars and, in January 1903, Anglo-American Motor Car Company, Ltd., was formed to take over its business. The two companies had the same owners and continued in parallel for several years. In August 1903 the Oldsmobile agency for Great Britain and Ireland passed to Charles Jarrott and Letts, Ltd., on Great Marlborough Street, London (Fig. 3). The reason for the change is not recorded but perhaps Peckham's efforts at promotion had not been considered effective. At the time of the transfer Oldsmobile was among the most popular cars on the market and it is difficult to imagine a reason why Anglo-American would have willingly given up the agency.

Fig. 3 – Charles Jarrott and William Letts in their offices, 45 Great Marlborough Street, London (from The Automotor Journal, *June 13, 1903, supplied by the author).*

Charles Jarrott was a wealthy young English sportsman drawn into motor competition after an introduction to racing during the bicycle craze, then of motorcycles and motor tricycles. He began his automobile racing career in 1898 as an experienced motorist and competed in the 1902 Paris-Vienna race. He won the Circuit of Ardennes in a 70-horsepower Panhard, his only major victory, and came in fourth in the Paris-Madrid race in July 1903. Prior to that event, he took the London agency for De Dietrich cars in partnership with his friend, William M. Letts, selecting the make as the most progressive of the French manufacturers.[21]

We have met Letts during his sojourn at Locomobile where his efforts earned him the praise of Samuel Davis, who said, "if the sales of our London office are due to any one man, they are due to Letts."[22] He had been involved in the motor trade from its very beginnings and at one time owned a stable of Cannstatt Daimler rental carriages obtained from Harry J. Lawson, the management of which gave him much grief. A man of active enterprise, he was with Jarrott in New York in 1900 when he attempted to demonstrate one of Lawson's motor bicycles on Fifth Avenue in a newly fallen snow, with disastrous results. Jarrott reported that "the first words he uttered as he lay on the ground were to the effect that never again would he attempt to ride a motor bicycle, a vow he has solemnly kept to this day."[23] Released from his previous employment by the closing of the British Locomobile branch, Letts was available to join his friend in the business.

The skills of the two partners were well matched. Jarrott's name was known from his racing exploits and could open doors; Letts brought management ability and a flair for promotion. Acquiring the Oldsmobile agency, they set out to add luster to its reputation and build the franchise. Oldsmobile historians have stated that the curved dash cars of 1901-02 were subject to a series of faults due to their overly-light construction. In 1903 the cars were almost completely redesigned by R. E. Olds and the new models were capable of giving much improved service (Fig. 4) . Jarrott and Letts inherited responsibility for some of the early models and, with them, their dissatisfied owners from the days of the Oldsmobile Company of Great Britain. They moved quickly to address complaints to preserve the make's good name.[24]

A car was entered in the Royal Automobile Club 1,000-mile Reliability Trial in September 1903 and factory employee Dwight Huss was sent from Lansing to drive it. He led all 23 cars in his class and was awarded the gold and silver medals.[25] Huss will be remembered as the driver of Old Scout in the New York to Portland run in 1905. The positive effects of this and other victories were reinforced by news of the American transcontinental crossing of Lester Whitman and Eugene Hammond in the summer of 1903. The company was well aware of the potential benefit of these wins and, for the 1904 Small Car Trials, allocated two machines to be specially prepared in its Experimental Room under the direction of Howard Coffin, the chief engineer.[26] In this event, however, their efforts were not crowned with success. Active factory support for entrants in competitive events was not usual among American firms and it shows how high an importance the company placed on success in the export trade.

In August, Letts put an Oldsmobile at the disposal of *The Autocar*. Surprisingly, this motoring journal had not sampled one before, and it gave the car a very favorable review. The writer began by commenting on the convenience of the tiller steering, saying that "the handy little car was in, out, and round almost before the driver of a wheel-steered car has got half a turn to his wheel." He was also impressed with the silence of the engine and running gear, declaring that "the exhaust strikes on the car no louder than the panting of a good-sized dog."[27] Simplicity of operation was considered equivalent to that of a steam car, especially by virtue of its two-speed epicyclic transmission, a feature then common on American cars. *Automotor Journal* was also given a test car, which they completely disassembled in order to examine and photograph its construction. The well-illustrated three-part article demonstrated their assessment of the commercial and technical significance of the vehicle.[28]

The development of foreign sales was from the start a goal of the Olds Motor Works beginning with agents in Canada and Mexico in the summer of 1902. By the following year there were independent agents in the principal European countries. Fred and Angus Smith representing the owners attended automobile shows in Paris, Berlin, and London in 1903 and in Berlin saw the Polymobil, a curved dash built under license for the German market by the Polyphon Musical Instrument Works. Dwight Huss and his supervisor, John L. Poole, were sent to Russia in the fall of 1903 to assist in setting up dealerships in Odessa, Moscow, and Saint Petersburg.[29] The Olds was strongly promoted there, the Moscow agent claiming in 1905 that 80 of the 150 automobiles in the city were Oldsmobiles. Huss and Poole later traveled to Denmark and Sweden. General export agents were appointed for Europe and Australasia and for the Far East. These complicated arrangements may not have been judged efficient and the directors voted in July 1904 to investigate the installation of a European branch to bring order to the operation, but it is not known if the action was taken.

The company conducted meetings of its agents and sales staff in Paris and Lansing in 1905. New models were shown and orders solicited from the agents. Poole was later appointed manager of export operations. He traveled extensively visiting the foreign agencies and attending automobile shows. A photograph has survived showing him demonstrating the power of the Oldsmobile by climbing the steps of a public building in Odessa.

In later years it became fashionable to claim that the American cars that were first exported were of poor quality, incorporating used or defective components. The opposite was true of the Oldsmobile. A February 1904 order from the company's main office directed that cars intended for foreign shipment have a series of quality upgrades in fittings, washers, waterproofing of electrical equipment and French Standard spark plugs. Rear wheel hub brakes were fitted to foreign cars, a feature not used on domestic models. In July a further directive stated: "To fill export orders the Testing Department will save out of each day's production the best machines and turn same in to Shipping Department in sufficient quantity to meet export orders. It is a matter of the greatest importance that these machines for export should be in every respect up to our highest standard."[30]

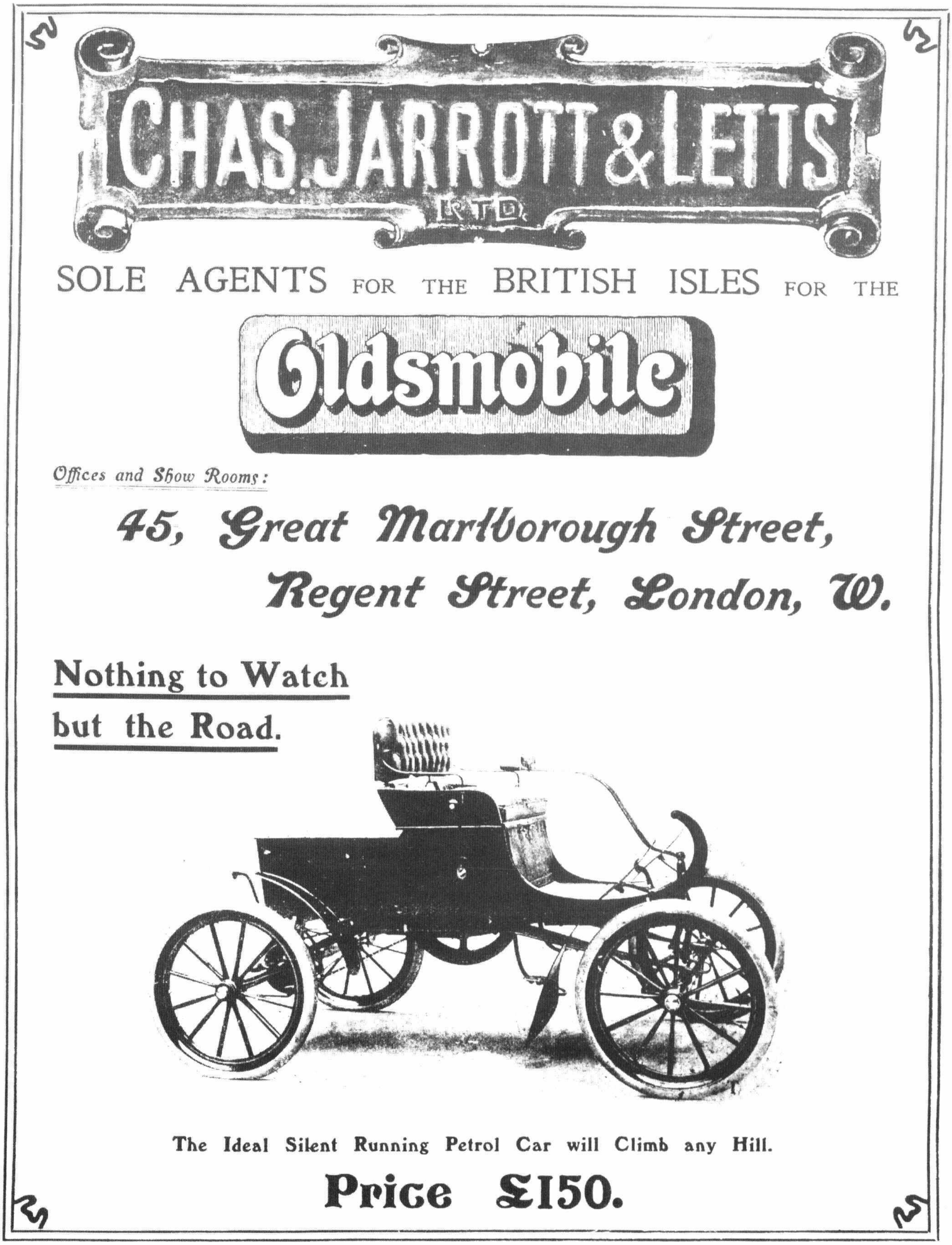

Fig. 4 – Brochure cover with Oldsmobile ad (from The Automotor Journal, *August 5, 15, and 22, 1903, supplied by the author).*

In February 1905, General Manager F. L. Smith wrote to the shareholders. Looking back on the successful operations of the previous two years and the completion of factory expansion that would enable the company to meet demands, he was optimistic about future prospects. The Curved Dash Runabout was the core of the company's business and its steady sales demonstrated the wisdom of offering a model in the lowest price range. The new more expensive Touring Runabout and Light Touring Car were not expected to displace it. Foreign business had grown to represent 30 percent of sales and a further proportional increase was predicted.[31]

Smith could not have known that current high sales records would not be bettered for ten years and that the company would soon be forced into an association with its rival, Buick, and the arms of a giant conglomerate. The Curved Dash Runabout, for all its charm, could not indefinitely remain at the forefront of style and its upgrade into models with dummy hoods and wheel steering put it squarely into the price range of its new competitors: Ford, Reo, and Cadillac. To be "the best of its type and a universal machine" was not sufficient to ensure its future in a fast moving field. Nevertheless, the survival of approximately 1,000 examples with 300 in foreign ownership after a period of 100 years gives testimony to its good qualities.

Then Came Cadillac

In 1902 the Oldsmobile Company of Great Britain engaged a young Englishman, Frederick Stanley Bennett, as Works Manager. Bennett was born in 1874 and apprenticed to the London and North-Western Railway works at Crewe. He later became Chief Resident Engineer at the St. James's and Pall Mall Electric Light Company in London. Oldsmobile was his first experience in the motor trade and he purchased his first car, a curved dash runabout, at this time.[32] The following January he found himself at the New York Automobile Show where, at the stand of a newly-introduced American car, the 6-horsepower Cadillac, he met one of the most charismatic figures of the American industry, William E. Metzger.[33]

Metzger was the proprietor of Detroit's largest automobile agency, showing in his Jefferson Avenue store, in addition to Cadillac, Winton, Yale, Packard, Toledo steamers, and Baker and Columbia electrics. Appointed sales manager for Cadillac in the fall of 1902, before the car was in production, he advertised extensively in the trade press in search of dealers and by February 1903 had secured 22 agents across the country. Bennett traveled to Detroit where he met Henry and Wilfred Leland and heard the message of accuracy and interchangeability that was the creed at the Leland & Faulconer plant. He ordered a car for delivery to England.

Fig. 5 – First appearance of the Cadillac in Great Britain, Sunrising Hill, 1903 (from *The Romance of the Cadillac Car*, issued by F. S. Bennett, Ltd., ca. 1920, supplied by the author).

In June, Metzger traveled to London with a complete line of models "intending to close the continental agency for his company. He would be at the Hotel Russell not later than July 3 and invited correspondence at that address with parties interested in foreign representation of the Cadillac."[34] It appears he was not successful for the company was again searching for French agents at its first appearance at the Paris Salon two years later. Perhaps Metzger can be pardoned; the 1903 visit was his wedding trip. In London he set up the Cadillac agency for Anglo-American. The initial manager was George W. F. Brock, but by 1905 he had been replaced by Bennett. Certainly Metzger would have been hesitant in granting agency rights for the United Kingdom to a young man with barely a year of experience in the motor trade. Peckham seems to have left the business at this time.

Bennett's car was shipped on June 4, 1903, through the Cadillac Company of New York and arrived in August, the first Cadillac in England. It was campaigned in hill climbs and reliability trials and made a good showing (Fig. 5). Cadillac sold only 54 cars in the export market in its first year, 1903. Thirteen were delivered to Hyslop Brothers in Toronto, 10 to Dexter & Crozier in Auckland, New Zealand, and 31 to Anglo-American in London. A fourth foreign agent, Compania dos Vehiclos Electricos in Mexico City, was added in 1904. Cadillac's total foreign sales during its first two years of operation did not exceed 200 cars, a meager result when measured against the grand success of the Oldsmobile. The majority of these sales were made through the four agents named.[35]

During its first two years of operation, the Cadillac Automobile Company was owned by a group of investors led by William Murphy and Lemuel Bowen. The firm was the outgrowth of the Henry Ford Company formed to manufacture cars designed by Henry Ford, but Ford had resigned after disagreements with the directors. Leland & Faulconer served as suppliers for the mechanical parts of the car but were not at first involved in the management of the company. Cadillac's neglect of the foreign market was no doubt due to the passive approach taken by the directors who had entered the motor trade primarily as an investment.

The car sold on its merits. Foreign agents were engaged when they approached the company, not by company representatives who searched them out. Anglo-American's agency had resulted from Bennett's visit. Dexter & Crozier applied to represent the make after David Crozier, a New Zealand bicycle dealer, inspected the Cadillac plant on a visit to Detroit. There appears to have been no organized effort to pursue the international market. In 1905, after the Cadillac

Motor Company was reorganized under Leland management, a more proactive stance was taken. Charles Greif was appointed to the full-time position of export manager and traveled the world appointing agents. Cadillac's foreign business essentially begins with this activity and export sales increased. In October 1906 Metzger announced that Cadillac expected to export "nearly if not quite 1,000 machines during the coming season, these being produced now because of the unprecedented demand."[36] Sales for the previous two years must have been lower. Although the car was successful because of its reputation for quality construction, it did not enter the foreign market until the taste had turned away from the light American runabout.

The decline in popularity of the American runabout forced the manufacturers to introduce new models more in the European style. Those of Locomobile and Oldsmobile did not catch the public's fancy and, first Locomobile in 1903 and then Oldsmobile in 1907, closed their agencies and abandoned the export market for many years. Cadillac alone, after several false starts, introduced a four-cylinder car of conventional, that is to say European, design, at an attractive price. It was able to sustain its position and eventually became, with Buick, a mainstay of the General Motors export program.

The American runabout had been tried and, although well received, found lacking in comfort, performance and style. Nevertheless, it was to be the pathfinder for a great automotive wave of the future.

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American Runabouts – Production and Exports

	Locomobile Steamer	Oldsmobile Single Cylinder	Cadillac Single Cylinder
1899	600		
1900	1,600	5	
1901	1,400	425	
1902	1,100	2,500	3
1903	500	3,976	1,652
1904		3,412	2,319
1905		2,094	3,878
1906		300	2,350
1907		200	2,350
1908			1,482
Production	5,200	12,912	14,822
Exports, Estimate	1,300	3,100	2,800

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The Shift from Shift to Shiftless: Transmission Advances in U.S. Cars (1929-55)

by Byron Olsen

Introduction

It's so simple to drive the family car today. Just move the transmission lever from Park to Drive through Reverse and Neutral, depress the accelerator pedal and off you go. It wasn't always that way of course. Eighty years ago to get a car to move involved many more steps. First, you depressed the clutch pedal, then carefully shifted from neutral to first gear with your foot on the accelerator pedal, and then double-clutched your way to second and high. Double clutching means pausing in neutral when shifting, for example, from first to second gears. While in neutral, the driver engaged the clutch momentarily and blipped the throttle to start the second speed gears rotating to match the rotational speed of the rest of the gear train with which it is about to be meshed.

During the ten years of the '20s, the automobile in the United States went from a plaything of auto enthusiasts and the well-to-do to an essential part of nearly every American's life. The automobile's appeal of greatly enhanced personal mobility, coupled with the unique genius of the American auto industry in making cars affordable to a wide spectrum of the citizenry, proved irresistible to the buying public. But this popularity was not because cars of the day were particularly easy to drive. The challenges for the fledgling motorist were daunting. Snail-like acceleration, crash gearboxes with straight-cut teeth requiring double clutching in order to shift smoothly, mechanically-actuated brakes on only two wheels, little or no interior heat in the winter, hard steering with wheel fight from every bump, and on and on. As the roaring '20s (that was the roar of car engines) came to an end, the average automobile remained something only a motorhead could love. One almost had to be an auto enthusiast to learn and enjoy driving a car.

As mechanical reliability improved, the auto manufacturers began to turn their attention to improving the driveability of their products in order to make them more user-friendly. The need to shift gears and manipulate the clutch was probably the most difficult challenge for the first-time motorist of the '20s, male or female. Even among those who had mastered the operation of the clutch, there was a desire for easier driving. Anything car builders could do to accomplish this held the attraction of vastly expanding the market by making car ownership appealing to new segments of the population. This article will focus on efforts made by the auto industry to accomplish this goal by improving drivetrain performance — first by making gear shifting and clutch tending easier; and second, by eliminating or greatly reducing declutching and shifting by the driver in everyday operation.

Synchromesh Transmission

The first significant development in this industry effort to make driving easier was the synchronized or "syncro-mesh" transmission (later simply "synchromesh"). Introduced by GM on Cadillacs in 1929, it was a true breakthrough. Not to be overlooked, at about the same time there was another development that soon became standard in the industry as well: helical gears. Helical-cut gears angled the gear teeth to make them run more quietly, and some claimed, easier to engage. But synchromesh went further and provided a mechanism to bring the gear about to be engaged up to speed prior to engagement, thereby eliminating clash and grind as the teeth of the two gears meshed. For many decades, synchronizers were applied only to second and third (high) gears, but by the '60s were extended to first and even reverse on manual transmissions.

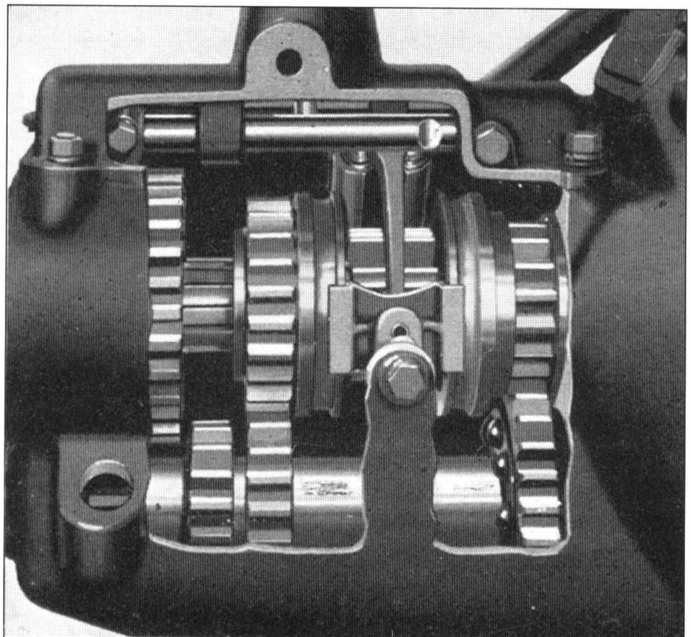
Synchromesh gears were developed by an inventive young engineer named Earl Avery Thompson. Aware of the difficulty most drivers had with double clutching in order to effect smooth shifts, Thompson had developed a synchromesh system by the early '20s. The art, or luck, lies in bringing the gears up to the right speed by feel to avoid clashing. It took Thompson several years, and several trips to Detroit to make the rounds of the car builders before he was able to convince one of them to try his idea. Most agreed it was a desirable concept, but anticipated cost and concern over durability were the major deterrents.

Finally, in late 1924, Cadillac Division took the plunge and bought the patent rights from Thompson, hiring him as an outside contractor for good measure. It was the start of a prophetic history-making relationship. Thompson had some ideas about designing a fully automatic transmission as well and went on to lead the GM team that eventually developed Hydra-Matic, the first successful fully-automatic transmission.

Over the next four years, Thompson and Cadillac Engineering developed four variations of Thompson's idea for synchromesh, always with the goal of reducing manufacturing costs without impairing performance. Thompson's basic concept involved the addition of synchronizing rings which brought up the speed of gears about to be engaged for clash-free engagement.

Finally, synchromesh was deemed ready for release and was introduced on the 1929 Cadillacs (Fig. 1). It was an immediate success and the rest of the industry soon followed. By 1932, it was available on 22 of the 78 model lines offered by the industry that year, including all nine GM lines. Synchromesh eventually spread to virtually every marque. Some manufacturers tried to delay adoption of synchromesh by inferring that helical-cut gears produced the same result. As Lincoln put it succinctly in its 1931 Model K sales catalog, "Second speed gears are cut with spiral teeth which make them practically noiseless in operation when the car is being driven in second gear."

Another major development that was arguably a step toward easier (i.e.less shifting) driving was the major shift in



The Syncro-Mesh transmission utilizes cone clutches to equalize the rotating speed of the gears just before the shift is completed.

Fig. 1 – Synchromesh transmission as first used on the 1929 Cadillac, from Cadillac Mechanism and Coachcraft, *Cadillac Motor Car Company* (from the editor's collection).

1930-32 from 4- and 6-cylinder to 8-, 12-, and 16-cylinder engines. Many medium-priced cars received 8-cylinder motors while the high-priced vehicles offered V-12 and V-16 engines. Especially at the top end, one of the objectives of more cylinders was smoother low-speed performance: the ability to lug without jerking. Thus, the driver could sail around a low-speed corner at, say, five miles per hour, and accelerate smoothly away in high gear without having to downshift to second, with no snatching or jerking. Reducing the need to downshift made driving that much simpler and easier. This low-speed lugging ability was usually abetted by a low-geared rear axle ratio. In those pre-freeway days, there were few opportunities to cruise at much over 50 mph and so axle ratios were typically in the 4.5 to 1 range or numerically higher. Comfortable high-speed cruising usually requires an overall final drive ratio of under 4.0 to 1.

Free Wheeling

The next innovation to be adopted throughout the industry in the interest of easier driving was free wheeling. Those of us who grew up in the later overdrive era have assumed that free wheeling was a misguided, poorly thought out economy device that was blatantly hazardous because it eliminated engine braking. The device consisted of a relatively simple and trouble-free overrunning clutch mounted inside or at the rear of the transmission. A button on the gear shift knob (or a lever or pull knob on the dash) controlled engagement.

When free wheeling was engaged, the car coasted with the engine disengaged from the driveshaft whenever the accelerator was released. The engine speed then dropped to idle which "saved fuel, saved oil, saved wear and tear on the engine" or so the advertising claims went. But economy was not the only reason advanced at the time in favor of free wheeling. Introduced by Studebaker on its 1931 models, the device was also promoted as a means to make gear shifting smoother and even permit shifting without use of the clutch (Fig. 2). Better gas mileage was usually mentioned, but seldom as the principal reason for buying free wheeling. Indeed, shifting *was* smoother —clash free even if your free-wheeling car did not yet have synchromesh. And you really could shift without the clutch. Once underway (the clutch was needed to start from a dead stop), you could flick idly up and down through the gears simply by letting up on the accelerator. Only when you were forced to a complete stop was resort to the clutch pedal again necessary. At the lower speeds experienced in urban areas, the lack of engine braking was not a problem. If hills were encountered, you could lock out free wheeling without stopping the car.

Six months after Studebaker introduced free wheeling, Pierce-Arrow, Lincoln, Auburn and Hupmobile had adopted it. Free wheeling swept the industry by 1932, but was gone almost as quickly. By 1936, it had virtually disappeared from U.S. option lists. Where it remained, it was sometimes combined with overdrive, then just arriving on the scene. Studebaker by 1936 was bragging about having introduced free wheeling and how free wheeling had made possible the development of overdrive. For that year, Studebakers could be ordered with free wheeling and with or without overdrive. After that, free wheeling as a stand-alone option disappeared.

Why did it appear and then disappear so quickly? Probably because synchromesh had spread to most makes of cars and thus most transmissions had become easier to shift without the necessity of paying extra money for free wheeling. Also, more and more drivers became concerned about the safety hazards inherent in eliminating all engine braking, especially at the higher speeds permitted by improving roads.

Automatic Clutch

The Depression was a tremendous spur to innovation and product improvement, and transmissions and clutches were a major area of focus. Seeking new ways to broaden the market appeal of the automobile, the engineers of Detroit were on a roll and were coming up with more devices to make driving easier. Free wheeling was one such example and another was the automatic clutch. Developed by Bendix, the automatic clutch became an option on several makes starting about 1932. A vacuum-powered cylinder activated by solenoids disengaged the clutch whenever the accelerator was released. Engine speed then dropped to idle. The effect was similar to free wheeling with one significant difference: the vacuum clutch would also disengage automatically when coming to a full stop. Then when the traffic light changed, the driver could select first gear and motor off, all without tending the clutch pedal. The clutch would be engaged automatically whenever the accelerator pedal was depressed. One could even do reverse gear manuvering without manually tending the clutch pedal, but the manufacturers discouraged that.

The clutch actuation was linked to the accelerator linkage and had to be carefully synchronized to work smoothly. As the clutch wore or the state of engine tune deteriorated or the controls and switches just plain got dirty or out of adjustment, clutch smoothness would deteriorate. At that point, rather than try to fix it, most owners would just switch off the device and

Studebaker *discovers* momentum just when America is seeking to *recover* it!

In the 78 years of Studebaker existence and expansion, America has on a number of occasions lost her momentum, but she has never yet failed to recover it!

Always the protagonist of progress, Studebaker has frequently been the prophet of prosperity.

Its expansion programs and contributions to transportation have coincided with national needs and given impetus to economic recovery.

And today, Free Wheeling, with Positive Gear Control, stands forth as the symbol of America's returning momentum!

Manufactured exclusively under Studebaker patents, and obtainable now and only in the superb New Series President, Commander and Dictator Eights, Free Wheeling is a blazing new star in the economic sky.

Studebaker engineers have triumphed in the worldwide search for the secret that gives to motoring a free and untaxed inheritance of power.

For the first time in the history of the internal combustion engine, momentum has been released from subjection to the engine that creates it, and put to work in Free Wheeling, with Positive Gear Control.

For the first time in a motor car you get the full benefit of momentum *automatically* . . . and the added benefits of momentum *economically*.

Strains on engine, transmission and axle are minimized. When your car has gone 10,000 miles, your motor has "worked" only 8,000 miles.

You save 12 per cent to 20 per cent on gasoline and oil . . . and the heavier the traffic, the heavier the saving!

You can shift from high to second — back and forth — at 40 to 50 miles an hour and never touch the clutch . . . in fact, you need use the clutch only to start or back up.

And there's nothing new to learn . . . nothing but still greater simplicity in driving! . . . nothing but still greater economy in upkeep! . . . but there is the thrill of motion that's a new emotion from the secret heart of power!

Wait till you try Free Wheeling! But don't wait to try it! Get a demonstration now in a Studebaker Seasoned Champion Eight, and you will instantly share the enthusiasm of Highway Commissioners and Safety Directors throughout the country for the epochal discovery of Free Wheeling.

Stop wasting your money on Power!
Start saving it with *MOMENTUM!*

THE STUDEBAKER CORPORATION OF AMERICA
SOUTH BEND
INDIANA

Fig. 2 Studebaker publicizes "Free Wheeling" with allusions to the Depression, rear cover The Studebaker Wheel, *October 1930* (from the editor's collection).

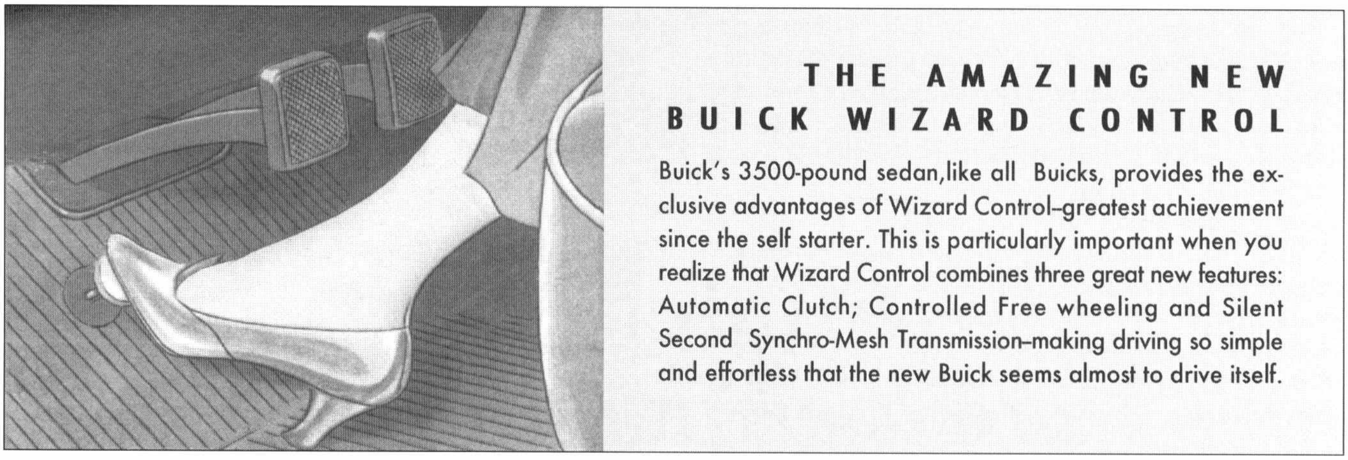


Fig. 3 - 1932 Buick "Wizard Control," as featured in a Division mailer (from the editor's collection).

forget about it. In addition to maintenance, what ended the brief automatic clutch vogue was that drivers came to realize that perhaps gear shifting was a bigger chore than clutch tending.

The automatic clutch did nothing to reduce the need to shift. Nor (perhaps just as important) did it help decide when to shift. Like free wheeling, by 1936 the automatic clutch had virtually disappeared. (But not entirely: see Hudson sidebar at end of this article). However, between 1933 and 1935, the automatic clutch was offered on a number of makes. In 1934, perhaps the high water mark, it was available on all the Chrysler Corporation cars (Plymouth, Dodge, DeSoto, and Chrysler) as well as Auburn, Hudson, Terraplane, and Stutz. But aside from Buick, no GM car ever offered an automatic clutch nor did Ford.

One clever variation on the free wheeling / automatic clutch theme was employed by Buick starting in 1932. Called the "Wizard Control," Buick offered what purported to be free wheeling (Fig. 3). Actually, Buick rigged an automatic clutch to perform like a free wheel unit. As long as the driver kept a foot on a floor button located near the clutch pedal, the auto clutch would disengage the drive train whenever engine speed dropped to idle. This gave the effect of free wheeling without the cost of installing a free wheeling unit on the transmission. Wizard Control had the added advantage of not requiring the driver to depress the clutch when bringing the car to a complete stop.

There was another unique advantage: anytime there was a desire to return to direct drive and engine braking, you just switched off the device by sliding your foot off the "Wizard Control" floor button and the clutch would instantly engage. In a car with conventional free wheeling, the driver had to move a lever on the dashboard to disengage free wheeling.

The Buick control mechanism was sophisticated enough to actually provide for a more gradual clutch engagement when starting from rest as compared to shifting between the higher gears after getting underway. But the automatic clutch was more difficult to keep in adjustment and was definitely higher maintenance than a free wheel unit. Buick quietly dropped the device after just two years.

The Road to the Automatic Transmission

The Roller Transmission

By the mid-'30s, some of these early efforts to make driving easier had run their course and been abandoned, such as free wheeling and automatic clutches. Others had been widely adopted throughout the industry and remain today, such as synchromesh transmissions and helical gears. There was wide recognition in the industry that these devices fell far short of the goal, that of a fully automatic transmission. Efforts to develop an automatic transmission were going on full bore both within the industry and by numbers of eager inventors outside of Detroit's engineering departments. Clearly, public interest was growing. Devices to make shifting *easier* had been explored. Now the time had come to take steps to seriously *reduce* the amount of gear shifting. The challenge came down to meeting two objectives: (1) developing a reliable means to permit the engine to idle in gear yet pull the car when the engine was accelerated, without any driver action other than pressing the accelerator; and (2) developing a transmission that would shift under load, again without any driver direction or action other than stepping on the gas pedal.

The U.S. Patent Office files are filled with plans for all manner of automatic shifting devices. Most were too complex or looked impossible to produce economically or simply did not look to automobile engineers as if they would work. They will not be reviewed here, with one exception: a major effort by Buick Division to design an automatic transmission in the early '30s, significant because Buick was a leading car builder. Years of work and millions of dollars went into development of what came to be called the roller transmission, but in the end, when ready for production about 1934 or 1935, the project was cancelled. There were several reasons: the transmission weighed three times as much as a manual transmission, added a good $500 to the cost of the car (big money in the Depression), and had not shown good reliability. It was a continuously, or infinitely, variable friction transmission (CVT) with an automatic clutch to permit idling. There was no fluid coupling as became common in later automatics. The prototypes gave good performance in tests, but cost and doubts about longevity doomed it.

Overdrive

Another transmission development that first came to market in 1935 must be noted in passing. Even though it did not reduce shifting, it played a role in some early semi-automatic shifting arrangements. Overdrive became an option on Chrysler

Fig. 4 – How Reo promoted its" Self-Shifter" transmission in 1933, as shown in a company folder Why Shift Gears? (from the editor's collection).

products and on those of many independents beginning in the mid '30s. In the '40s, Ford products began offering it as well, but no GM cars ever used it until finally it became an option on the 1955 Chevrolet. Overdrive was developed by Borg-Warner and provided a fourth gear for faster, more economical cruising. It was electrically operated and engaged by simply letting up on the accelerator as soon as cut-in speed was reached, typically about 25 or 30 mph. Below that speed, the car free wheeled, so shifting could be done without the clutch. Once overdrive gear was engaged, engine braking returned. It could be locked out by pulling a lever on the dash. In the late '30s, a "kick-down" switch was added, connected to the accelerator linkage. Flooring the accelerator downshifted the car back to regular third gear giving extra acceleration for passing and hills. There was even a fifth speed available. If overdrive cut-in speed could be reached in second gear, letting up on the accelerator put the car into overdrive second, a gear slightly lower than direct drive high gear. This could be useful in heavy traffic. Overdrive was a popular, trouble-free device that improved fuel mileage and gave serious drivers more options and flexibility.

Reo's Self Shifter

The first serious effort to be put on the market to reduce gear shifting, and reduce driver effort in terms of making decisions about whether and when to shift gears, came in 1933 from Reo Motor Car Co. of Lansing, Michigan (Fig. 4). The Reo "Self-Shifter" eliminated the gearshift lever but not the clutch pedal. A "T" handle on the dash selected ranges and reverse. There was no fluid coupling here, either. The driver still had to push in the clutch pedal when stopping. But the Self-Shifter did upshift automatically under load between starting and cruising gear when the transmission was set in high range. Shifting was accomplished by centrifugal weights which spun outward as rpm's increased and, at about 12 to 15 mph, engaged a set of multi-disc plates to effect the ratio change. Acceleration was slower than a manual shift Reo, and some drivers felt the gear ratios were not well chosen. Reo worked hard to market its new brainchild, which had cost millions to develop, but Reos were selling poorly in the depths of the Depression. The Company left the car business in 1936 and built only trucks after that. Reo had hoped to sell the Self-Shifter to other car builders, but that never happened. Nevertheless, early versions were reasonably reliable and it was a significant first step towards a truly automatic transmission.

GM's Automatic Safety Transmission

Even before Buick gave up on the roller transmission, work was under way at GM on another type of automatic transmission, first at Cadillac Division and later at Oldsmobile. This effort started in 1932 and was really a corporate, rather than a divisional, project. It was directed by none other than Earl Thompson, inventor of synchromesh gears. By 1934, Thompson and his group had a transmission that would shift under full torque load without letting up on the engine throttle. Prototype transmissions were turned over to Oldsmobile in 1935 and 1936 for testing. This led to the June 1937 introduction of what ads called the "Automatic Safety Transmission" as an option on late-model 1937 Oldsmobile eight-cylinder cars (Fig. 5). This transmission was the forerunner of Hydra-Matic and incorporated many of its principles.

The Automatic Safety Transmission used two planetary gear sets in the gearbox which would become a key feature in the design of Hydra-Matic and later automatics as well. Similar in concept to the gears in a Ford Model T, planetary gears incorporate a ring gear with teeth on the inside of the ring, a sun gear in the center of the ring, and usually three planet or pinion gears connecting the sun gear to the ring gear. These gears are always in mesh. Shifts are effected by clamping a band around the outside of the ring gear to stop it from rotation. Because of the way the gears are connected to input and output shafts and other parts of the transmission, changes in gear ratios are accomplished by clamping or releasing the bands stopping or allowing rotation of the ring gears. In the Model T, the driver used foot pedals to apply the bands. In the Automatic Safety Transmission and subsequent automatics, hydraulics provided the muscle. Use of planetary gears was a key breakthrough and permitted gear changing under load.

The Automatic Safety Transmission still required a clutch pedal, but it was only used for starting, stopping and reversing. To get under way, you stepped on the clutch, started the car, and moved a steering column mounted selector lever (much like automatic shift levers today) to a position marked "L" for low range. Then you got underway by releasing the clutch and accelerating. The transmission then shifted under load to second gear without any action by the driver. Then you could move the lever to "H" or high range without using the clutch or even letting up on the gas pedal. The transmission would shift immediately to third gear, and then later to fourth gear depending on how hard you were accelerating. If you started the car from rest in "H," the transmission would start in first gear, then shift automatically to third, skipping second, and then finally to fourth gear. Like Hydra-Matic to come later, this was a true four-speed transmission. Although fourth was not an overdrive, GM claimed it had the same effect through use of a higher speed rear axle ratio than found on standard transmission models. Flooring the accelerator would downshift to third for passing or extra acceleration. Moving the selector lever back and forth between low and high ranges did not require use of the clutch or letting up on the throttle.

The new transmission worked fine, although it apparently was seldom ordered. For 1938, it was made an option for six-cylinder as well as eight-cylinder Oldsmobiles. The price was $80 in 1937 and raised to $100 in 1938, a hefty sum when the total price of an Olds Six four door was only $970. Buick was persuaded by GM corporate to try out the new transmission, although apparently with some reluctance. Buick engineers may have still been unhappy about having their roller transmission turned down. Buick's torque tube drive made it more complicated to offer the different length Safety Transmission as an option. A different-sized driveshaft and torque tube assembly would have to be tooled for each Buick model that would offer the new transmission. As a result Buick only offered the option on the lowest priced Series 40, the Special, and then only for one year 1938. Buick called it the "Self-Shifting Transmission" (with no apologies to Reo) while Oldsmobile used "Automatic Safety Transmission" in advertising. Oldsmobile continued to offer the automatic on all models through 1939, when the price was dropped to $75. After that, Olds would have Hydra-Matic.

A side benefit of the Automatic Safety Transmission (so named because the driver could keep both hands on the wheel at all times) was the elimination of the shift lever from the center of the front seat floor. Three people could now occupy the front seat more comfortably. In 1938, the gear shift lever began its migration from the floor to the steering column in most marques, with a few temporary stop-offs at the center of the dashboard. Cadillac was the first in 1938, and Ford products were the last, in 1940. Most other makes made the move by 1939.

The First Automatic Transmission: GM's Hydra-Matic

The Automatic Safety Transmission had successfully achieved one of the two main goals for the ideal automatic: the ability to shift back and forth between gear ratios under load. Now the stage was set for the other key breakthrough: elimination of the driver-operated clutch. The successful

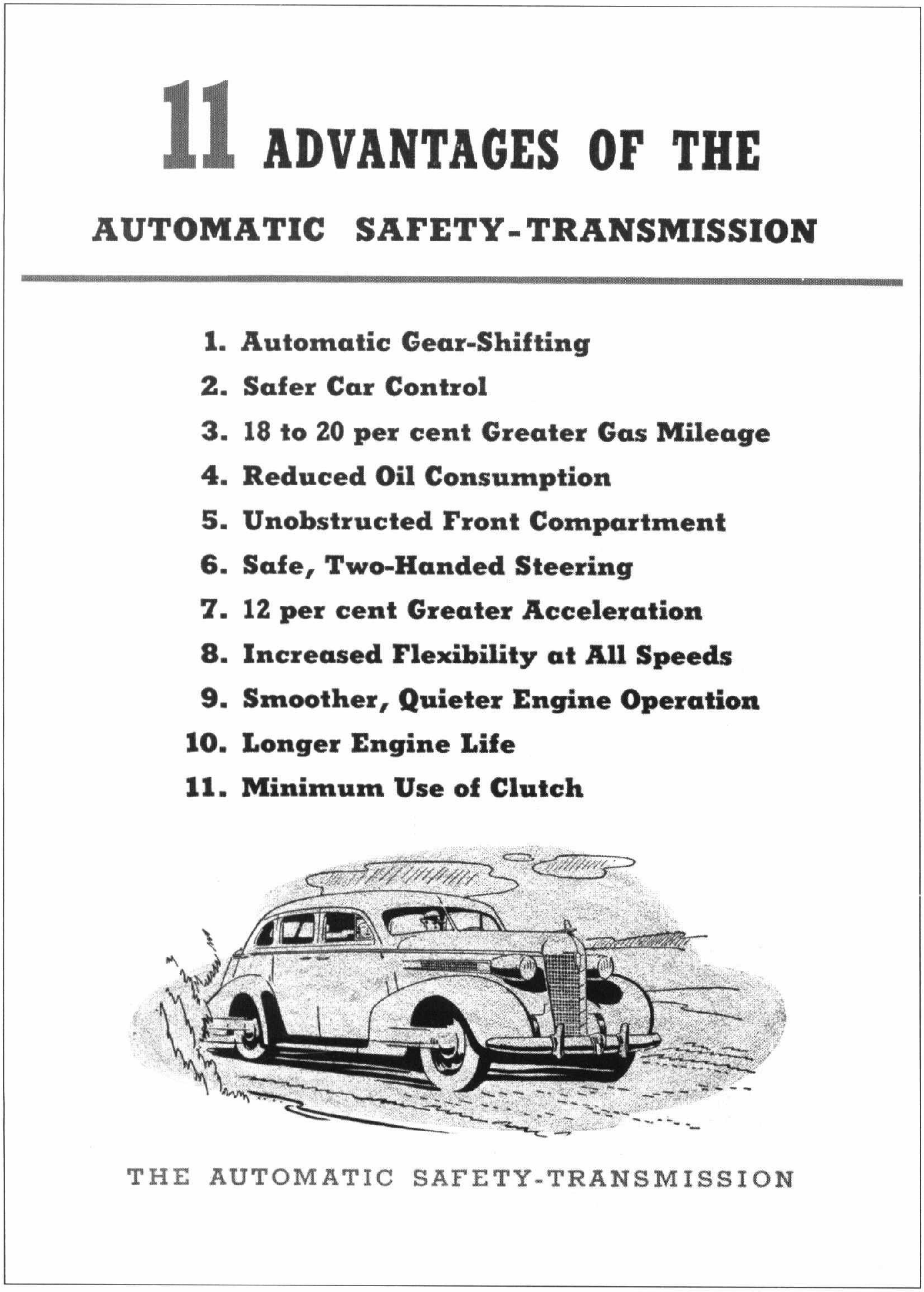


Fig. 5 – Oldsmobile's proclaimed advantages of its 1937 "Automatic Safety Transmission,"
(from the editor's collection)

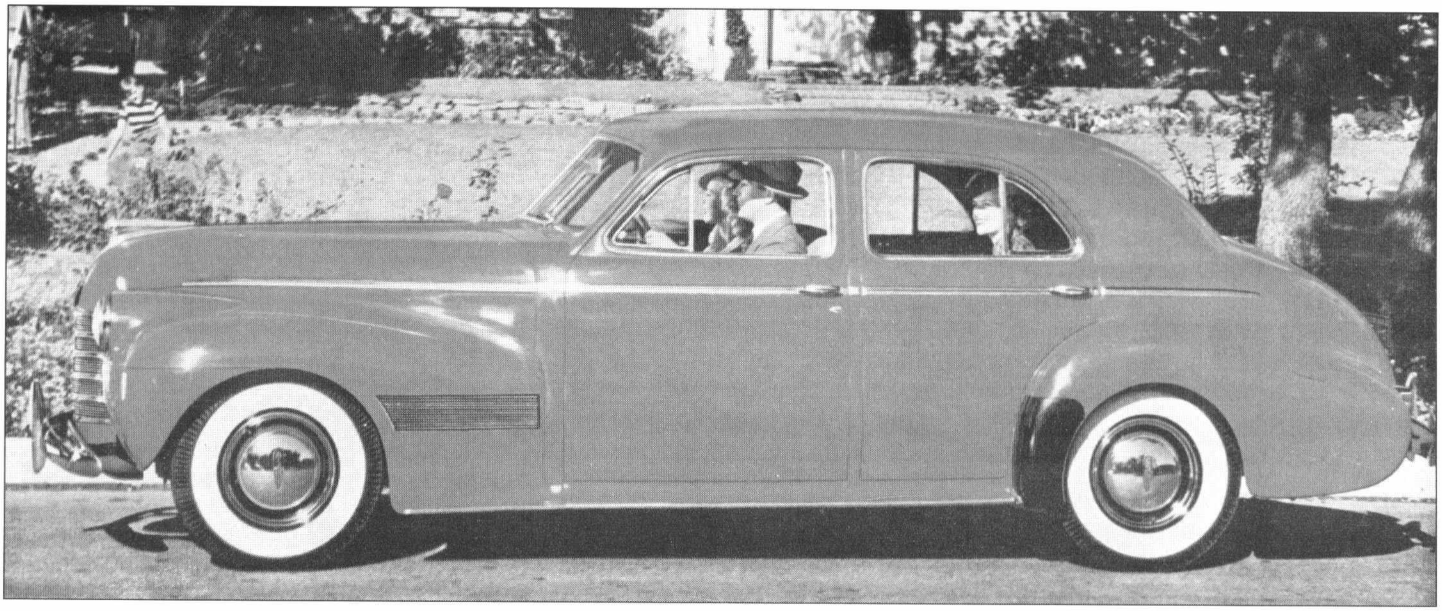


Fig. 6 – The fully-automatic "Hydra-Matic Drive" arrives on the 1940 Oldsmobile (supplied by the author).

solution to that challenge was inspired by British manufacturer Daimler which had developed a fluid flywheel in the early '30s to use in conjunction with its electric pre-selector gearbox. Ernest Seaholm, then chief engineer at Cadillac, saw one at the London Motor Show. Intrigued, he ordered a Daimler to be delivered to Detroit for study. When the car arrived, Seaholm was discouraged that no one seemed interested in the fluid flywheel. No one, that is, except our indefatigable Earl Thompson. To Seaholm's delight, Thompson immediately saw the possibilities and set to work incorporating the fluid coupling into what would become Hydra-Matic. This was the breakthrough device that would permit the engine to idle in gear, without any complicated mechanical devices to disengage it from the drivetrain.

What exactly, you may ask, is a fluid coupling? It can be compared to a pair of circular vanes not unlike electric fans facing each other. When one fan is turned on, the other soon moves from the air movement. In a fluid coupling, the fans are called rotors and are encased in a circular oil-filled housing. The medium for transmitting the energy from the driving rotor (connected to the engine and sometimes called the pump or impeller) to the driven rotor or turbine (connected to the drive shaft) is oil. There is no metal connection between the engine and the transmission, only oil. Chrysler called it "Fluid Drive," and the principle was eventually adopted by most early automatic transmission manufacturers. At idle, the engine-driven rotor did not rotate with enough speed to turn the turbine rotor (at idle, most fluid drive cars would creep but were easily held by the foot brake). When the engine was accelerated, the driving rotor would spin faster and cause the turbine rotor to begin to turn and move the car. It had the virtue of simplicity and being virtually trouble free, and at the same time not losing very much energy in the process. The perception of some drivers was that there was slippage, which wasted power and fuel, but it was not excessive.

Thompson and his crew—after eight years of work—were finished. The final design consisted of an oil filled fluid coupling, two planetary gear sets shifted by hydraulic power, and a centrifugal governor. The two gear sets working in various combinations gave four speeds forward. Although fourth gear was technically not an overdrive—the output shaft rotated at the same speed as the driveshaft—most Hydra-Matic equipped cars were supplied with a higher speed rear axle than a comparable manual shift car. This produced the same result as overdrive: lower engine rpm at cruising speed and thus less engine noise and better mileage. The component that made the transmission fully automatic was the governor. It told hydraulic servos when to shift gears, based upon engine and car speed. If the driver was accelerating vigorously, shifts would occur at higher speeds. The shift into fourth could occur at any speed between 18 mph and 68 mph depending on throttle setting. Downshifts into the next lower gear could be done by flooring the accelerator pedal at most speeds. The name "Hydra-Matic" came from a contraction of hydraulic and automatic.

It was the dawn of a new age. Oldsmobile introduced Hydra-Matic as an option for all the 1940 models, and for the first time all of the goals for a truly fully automatic transmission had been met (Fig. 6). When Hydra-Matic appeared, the world changed. It was arguably the most significant advance in automotive design technology of the mid-20th century. For the first time, there was not even a clutch pedal in the car! It was gone completely. So was the gear shift, replaced by a lever that clicked between discrete switch points, like an electric appliance. Just a single position to set and then you could drive all day without touching a gearshift lever, or a clutch pedal. Selector positions were, in clockwise order, N (neutral), Hi (high, renamed Drive in later years), Lo (low) and R (reverse). There was no park position, but the transmission would hold the car in place as if in gear, if shifted into reverse after the engine was shut off. Many years later a park position was added. On early Hydra-Matics, reverse was sometimes difficult to engage, and the shift lever could not be moved rapidly between reverse and low range to rock the car in snow or mud. This was remedied in 1951 by installation of additional clutches permitting easier engagement of reverse. Otherwise, the design concept worked well and received no significant modifications for over a decade.

Fig. 7 – Chrysler introduces "Fluid Drive" on the 1939 Custom Imperial (from the editor's collection).

Demand outstripped production that first year. More importantly, Hydra-Matic also performed well with no serious service or reliability problems. Now the most inept driver could motor off like a pro: just set the selector and step on the gas! And it cost only $57 extra, less than its semi-automatic predecessor.

Cadillac began offering Hydra-Matic on all 1941 models, and it was an immediate success there as well. Cadillac had participated extensively in the development of Hydra-Matic, so it was only fitting that it should be the next in the GM family to offer it. After Cadillac, Hydra-Matic was not offered on another GM make until 1948, when it became an option on Pontiac.

Chrysler Corporation's Fluid Drive

Not surprisingly, the successful debut of Hydra-Matic sent the competition scurrying to their respective drawing boards. Now every car builder was going to need something that could be called an automatic transmission. Elsewhere in the market place, Chrysler had introduced Fluid Drive in 1939 as standard equipment on the top-of-the-line Custom Imperial and offered it as an option on some 1940 models. (Fig. 7) That year, the fluid coupling could only be ordered mated to a regular three-speed manual shift gearbox equipped with overdrive. This combination offered some interesting semi-automatic driving possibilities. Around town, you could drive all day using second and second overdrive, starting from a stop and shifting back and forth just by letting up on the gas and without using the clutch. Chrysler called its overdrive "Cruise and Climb" transmission. For 1941, Chrysler introduced the "Vacamatic" semi-automatic transmission and also offered it on DeSoto, where it was called "Simplimatic." This consisted of a fluid coupling and a gearbox with two gear ranges and two speeds in each range, four speeds forward in all. The transmission would shift itself within a range, but not between ranges. A manual clutch pedal was retained, and you had to use it to move the gear shift lever to shift between ranges or into reverse. But once you selected a shift position, you could release the clutch pedal and the car would idle in gear because of the fluid drive. You then stepped on the gas to go. Whether low or high range had been selected, the car started up in the lower gear of that range. As soon as

There is some indication that Olds may have had some misgivings about taking this bold step. There is no mention of Hydra-Matic anywhere in the 1940 Oldsmobile sales catalog. If the new transmission had been withdrawn for any reason, the catalog would not need to be reprinted! There was a separate booklet describing Hydra-Matic in detail, and the new transmission was featured prominently in magazine advertising. However, the new transmission sold well right from the start, unlike its predecessor the Automatic Safety Transmission.

speed reached about 15 mph, you let up on the gas momentarily and the transmission shifted itself into the higher gear of that range. Subsequent stops and starts did not require any clutch work or moving the shift lever. In normal driving, only the high range was used. Thus, you started from a stop in third and you shifted to fourth by letting up on the gas pedal. The column mounted shift lever looked like one for a manual transmission and had no position indicator (one was finally added in 1951). It shifted like an 'H" pattern manual transmission, except there was no low gear position. Second gear position got you low range and high gear position selected high range. This became the operating procedure for all Chrysler Corporation automatic transmissions from 1941 through 1953. There were refinements in the internal transmission control system, but no changes in basic driver operation.

These transmissions went by many different names during their production life, but it was all the same box. After Vacamatic, Chrysler called the transmission "Gyrol Fluid Drive," then "Prestomatic" (1949 and 1950), and finally, in 1951, "Fluid-Matic." In 1946, DeSoto began calling it "Tip Toe shift." Dodge began using the semi-automatic in 1949 and named it "Gyro-Matic." Earlier, from 1941 through 1948, Dodge used fluid drive with a conventional three-speed manual transmission. The semi-automatic gearbox was not available. That combination continued to be available on Dodge for a time after 1948. Dodge drivers with just the manual box could cut down on their shifting if they were willing to accept very leisurely acceleration by starting in high gear. But getting a full-sized Dodge rolling in high gear with only 105 bhp-cylinder engine from a 230 CID 6-cylinder engine was not an exciting proposition. Fluid drive did permit idling in gear.

Compared with fully automatic transmissions, the fluid drive transmission was simpler, and it was generally trouble-free. But there were some drawbacks that made this system a sales liability by the early '50s. There was still a clutch pedal and, although Chrysler tried to make that a virtue by labeling it a "safety clutch" (it said so right on the pedal), the public saw it as old-fashioned. Chrysler also claimed the driver-controlled shift was an advantage, but motorists didn't want to be bothered. The acceleration gear ratio (third) was a compromise that provided neither swift acceleration off the mark nor sustained intermediate range acceleration. First gear was a useless tractor low. But the greatest annoyance was the time it took for the transmission to shift when the driver released the gas pedal: over a second. This was noticeably slower than the comparable semi-automatic shift into fourth on an overdrive car.

Automatic Transmissions Offered by the Other Manufacturers

There were a variety of reactions to the arrival of Hydra-Matic from other car builders. Hudson had offered the automatic clutch as an option since 1932 and now for the first time gave it a name: "Vacumotive Drive." It was available with, or without, overdrive.

Packard did the same thing except that, unlike Hudson, it had little previous experience with these clutches. Packard labeled it the "Electromatic Clutch" and advertised that, used with overdrive second (Packard called overdrive "Aero-Drive"), it permitted no-shift driving (Fig. 8). Packard must have been

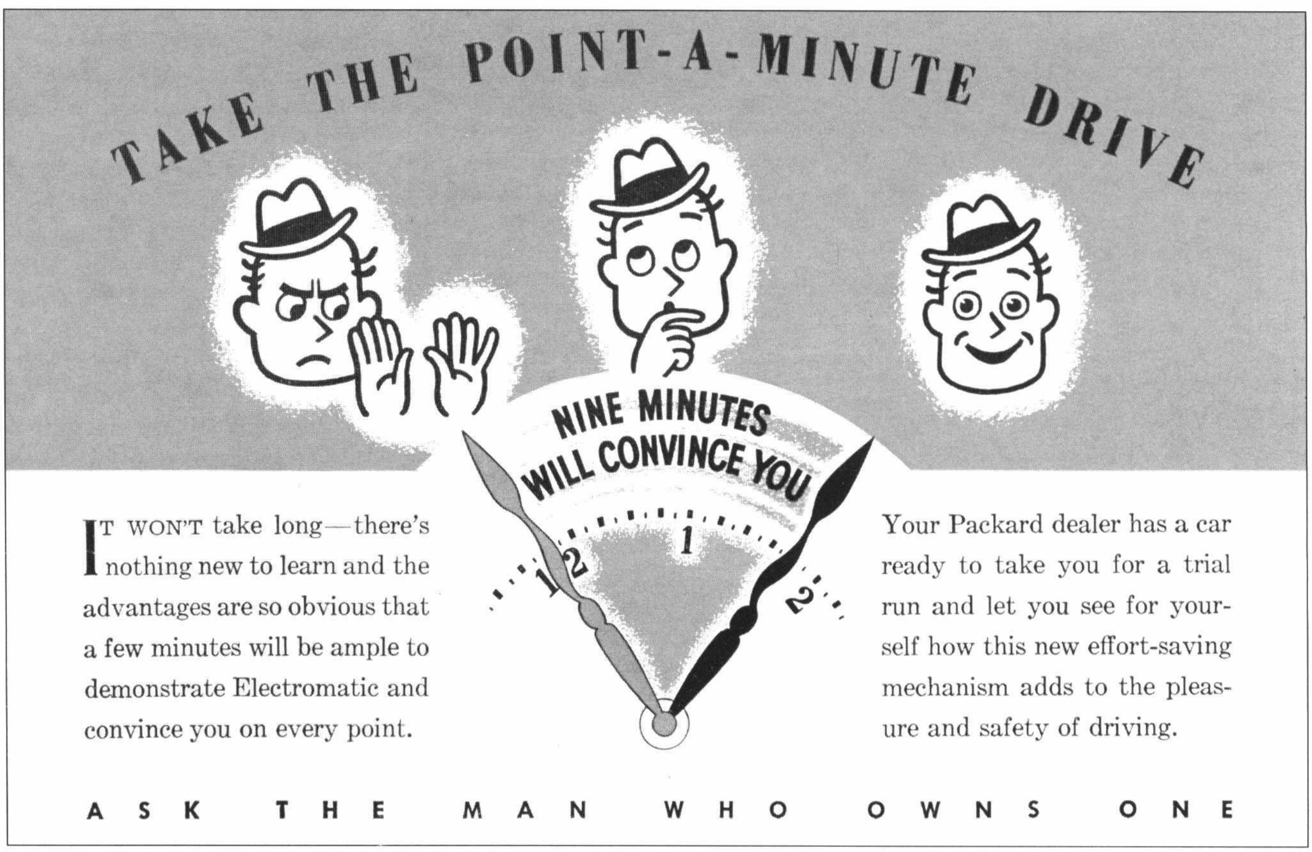


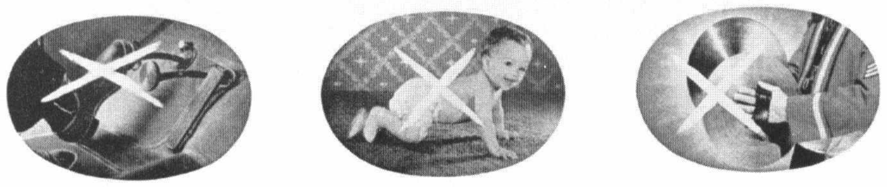
Fig. 8 – "Electromatic" comes to Packard in 1941 (from the editor's collection).

getting lots of customers asking for an automatic transmission that year, because by the end of the year, Packard ads were calling it Electromatic *Drive* implying perhaps more than an automatic clutch could deliver.

For 1942, Hudson added more vacuum cylinders and throttle-connected electrical controls to power shift the manual transmission between second and high gears actuated by what the driver did with the accelerator pedal. Named "Drive-Master," Hudsons with this option could be driven just like a Chrysler with Fluid Drive. Start the car, shift into high, step on the gas and then let up momentarily when the car got up to speed. The transmission then shifted into high. Instead of using a fluid coupling, Hudson accomplished this with an automatic clutch along with the additional transmission power shifting apparatus. The car actually started in second gear. This worked partly because Hudson used a unique and very smooth cork-faced clutch plate running in an oil bath. There were some advantages: Drive-Master could be switched off and the car driven with manual shifting, and the car did not creep at stop lights. But all of the complex cylinders and switches were exposed to dirt and weather and got out of adjustment easily. At least the driver could just switch the thing off and forget about it. Hudson continued to offer this option through 1951, after most other carmakers had gone to self-contained, fully-automatic transmissions.

Lincoln and Studebaker each announced automatic transmissions for 1942, and each turned out to be a fiasco. Studebaker combined a fluid coupling with an automatic clutch and a conventional three-speed transmission with overdrive and called it "Turbo-Matic Drive" (Fig. 9). The clutch pedal was eliminated. Research by Studebaker enthusiasts has led to the conclusion that only a handful of Turbo-Matic cars were built before World War II terminated automobile production.

Lincoln announced a new transmission called "Liquamatic Drive" as an option on 1942 Lincolns and Mercurys. Like Studebaker's Turbo-Matic, Liquamatic combined a fluid coupling with overdrive and something vaguely described as "a special automatic transmission." It was actually a modified three-speed gearbox and there was still a clutch pedal. Mechanisms and a governor were added to provide some degree of automatic shifting between second and high. Like the automatic clutches of the '30s and Hudson's various systems utilizing external switches, vacuum cylinders and other paraphernalia, Liquamatic had to be kept in precise adjustment to work. It soon didn't. The design was a hurry-up job for Lincoln which had only just adopted overdrive in 1941. The result was that virtually every Liquamatic was recalled and replaced with a manual transmission. To add insult to injury, Liquamatic required a modified engine block so that every engine had to be replaced as well. After these experiences, both Studebaker and Lincoln waited until the end of the decade before again attempting to offer automatic transmissions.



Studebaker's Turbo-Matic Drive

(Fluid Coupling–Plus Controlled Gear Selection and Automatic Overdrive)

1. Requires no clutch pedal.
2. Shift lever operates clutch during "range" changing.
3. Gives driver complete control of gear selection.
4. Assures clashless gear engagement.
5. Smooth, shockless turbine-type starting.
6. "Traffic range" and "cruising range" provide great flexibility in four smooth gear ratios.
7. Instant toe-touch shift into or out of overdrive.
8. Positive stopping, without "creep."
9. Surest, quickest shift to second or low gear for braking on hills.
10. Vibration banished from drive line by driving through oil, instead of through rigid unyielding control.
11. Permits starting on hill without roll-back.
12. Oil-cushion protects engine and driving mechanism.
13. If desired, driver can start and stay in high gear.
14. Car operation and control far simpler and easier.

Fig. 9 – Studebaker's ill-fated "Turbo-Matic" transmission, a casualty even before the war (from the editor's collection).

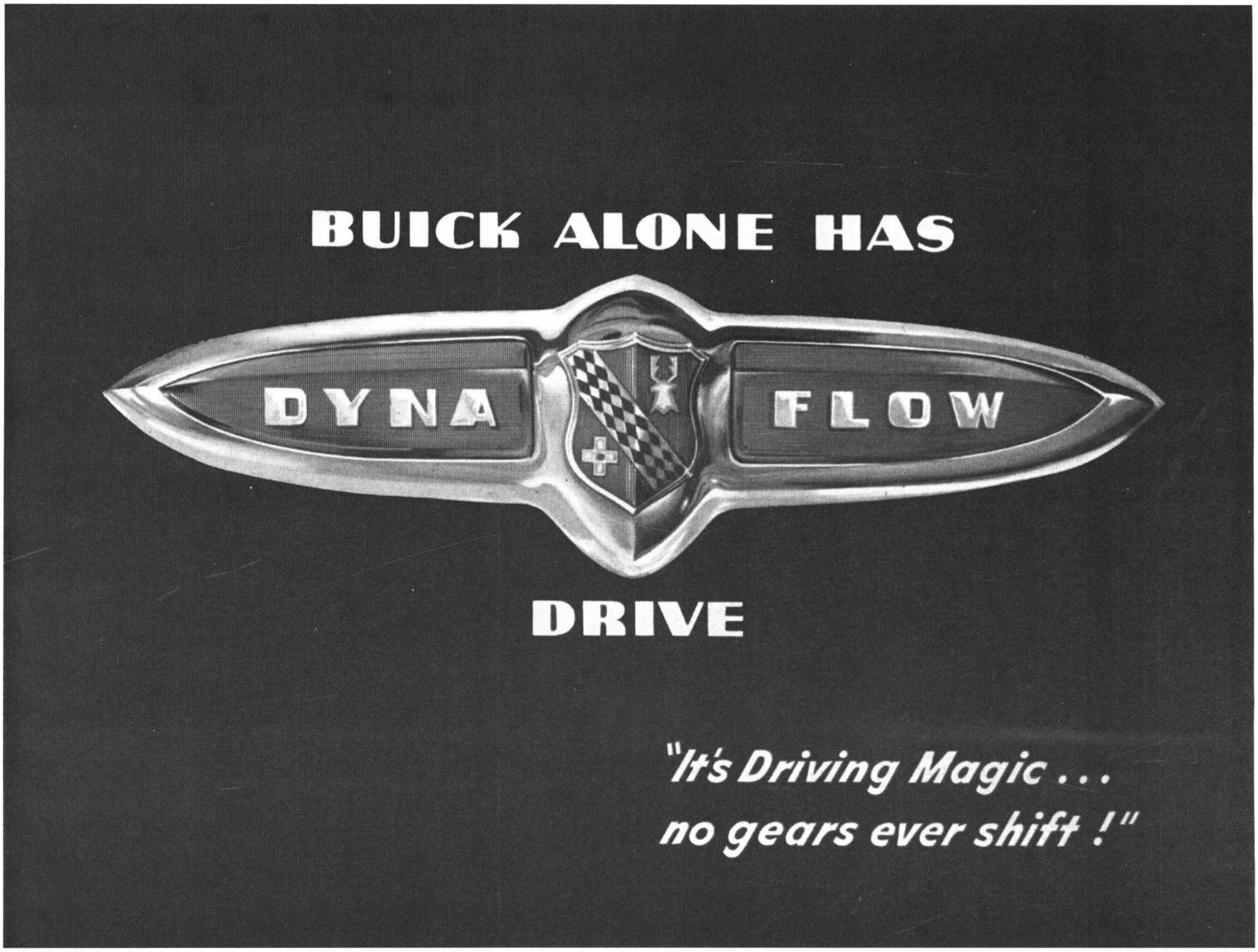


Fig. 10 – How the rear deck light appeared on 1948 Buick Roadmasters equipped with "Dynaflow," (from the editor's collection).

World War II put an end to the competitive scrambling to come up with no-shift transmissions. Civilian automobile production was suspended for three and one half-years, so the engineers could take a breather. After car building resumed, heavy demand for cars made it unnecessary to have an automatic to be competitive, at least until the sellers' market subsided in 1949. Problematic devices like Lincoln's Liquamatic and Studebaker's Turbo-Matic were put away and forgotten. There was time to develop proper fully automatic transmissions.

GM's Second Transmission: Buick's Dynaflow Drive

The first new postwar transmission came from Buick. Although the Division had briefly offered the Automatic Safety Transmission in 1938, Buick had not adopted Hydra-Matic even though GM siblings Cadillac and Oldsmobile had sold thousands of cars so equipped since 1941. Buick's efforts to develop the roller transmission in the '30s with its infinitely variable, completely shift-free operation had apparently left Buick engineers with the desire to develop something that would perform with the same characteristics. They wanted smooth, completely step-less acceleration, with no shifting of gears of any kind. The result was Dynaflow Drive, introduced as an option on the 1948 Roadmasters (Fig. 10). In 1949, it became standard on the Roadmaster and optional on the Supers and Specials.

Dynaflow achieved infinitely-variable, shift-free operation by use of a more sophisticated fluid coupling called a torque converter. This device, developed during the war by GM, added additional rotating sets of vanes (called stators) inside the fluid coupling to reroute the swirling fluid and increase pressure of the oil as it struck the turbine wheel turning the driveshaft. This had the effect of actually multiplying torque. A simple fluid coupling by comparison simply passed along the engine's output without adding any force. While Dynaflow did have some planetary gearsets, they were used only for reverse and an emergency low. All normal driving used no gear assist, just the torque converter. And of course, there was no clutch pedal. Dynaflow also introduced a "park" position. Selecting "P" dropped a pawl into a gear on the driveshaft side of the transmission locking the rear wheels. The shift quadrant read "P N D L R."

Dynaflow achieved the Buick objective of stepless acceleration. But it was soon perceived by the driving public as

Fig. 11 – Studebaker's controversial double-width brake pedal, introduced in 1950
(supplied by the author).

having a great deal of slippage. When accelerating, the engine revved up to a fairly high rpm and then stayed there until cruising speed was reached. People were used to hearing rpm rise and fall as transmissions, manual or automatic, went through the gears. Dynaflow Buicks also seemed slower because there was no periodic thrust forward as each gear shift took hold. Some drivers took to manually shifting to low range to get started, thus partially defeating the purpose of a no-shift transmission.

Buick was sensitive to these criticisms and counseled drivers to "let Dynaflow do it" and not step on the gas so hard. In 1953, Buick introduced "Twin Turbine" Dynaflow, and in 1955, "Variable Pitch" modifications in an effort to improve response. Powerful new V-8 engines introduced in 1953 also helped. In spite of the slippage reputation, Dynaflow sold well and within six years was being installed in 85 percent of Buick production.

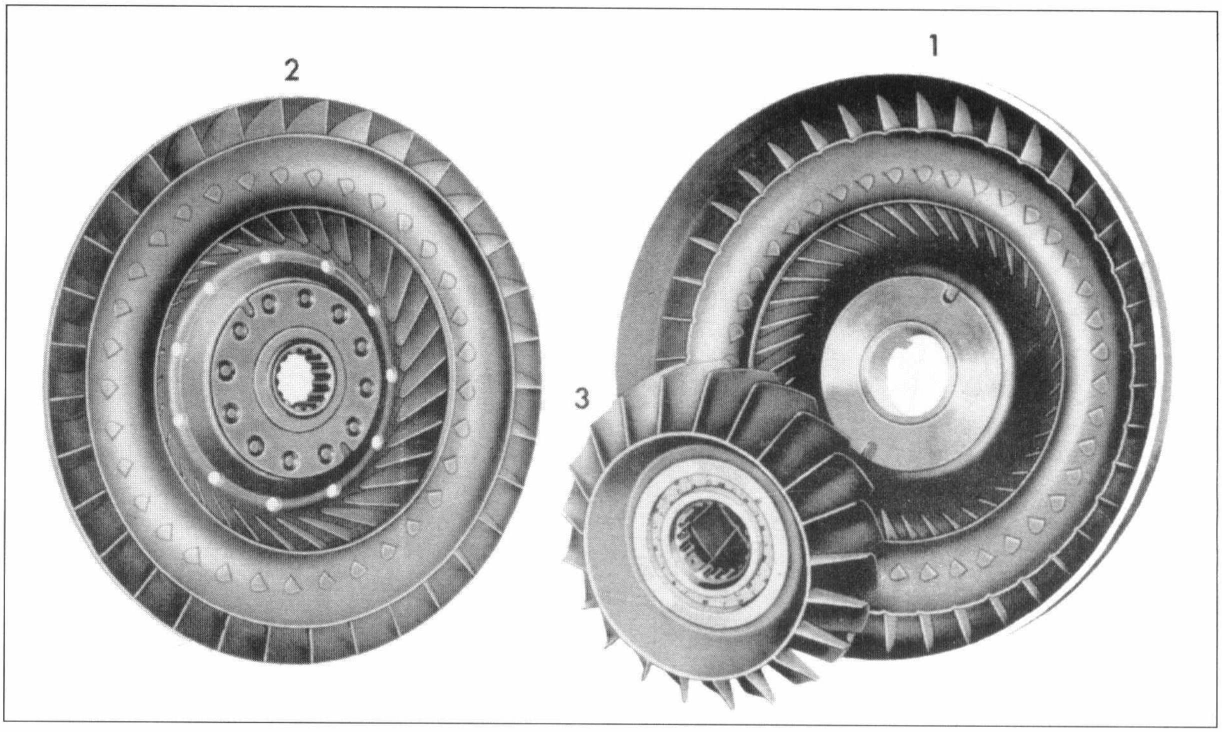
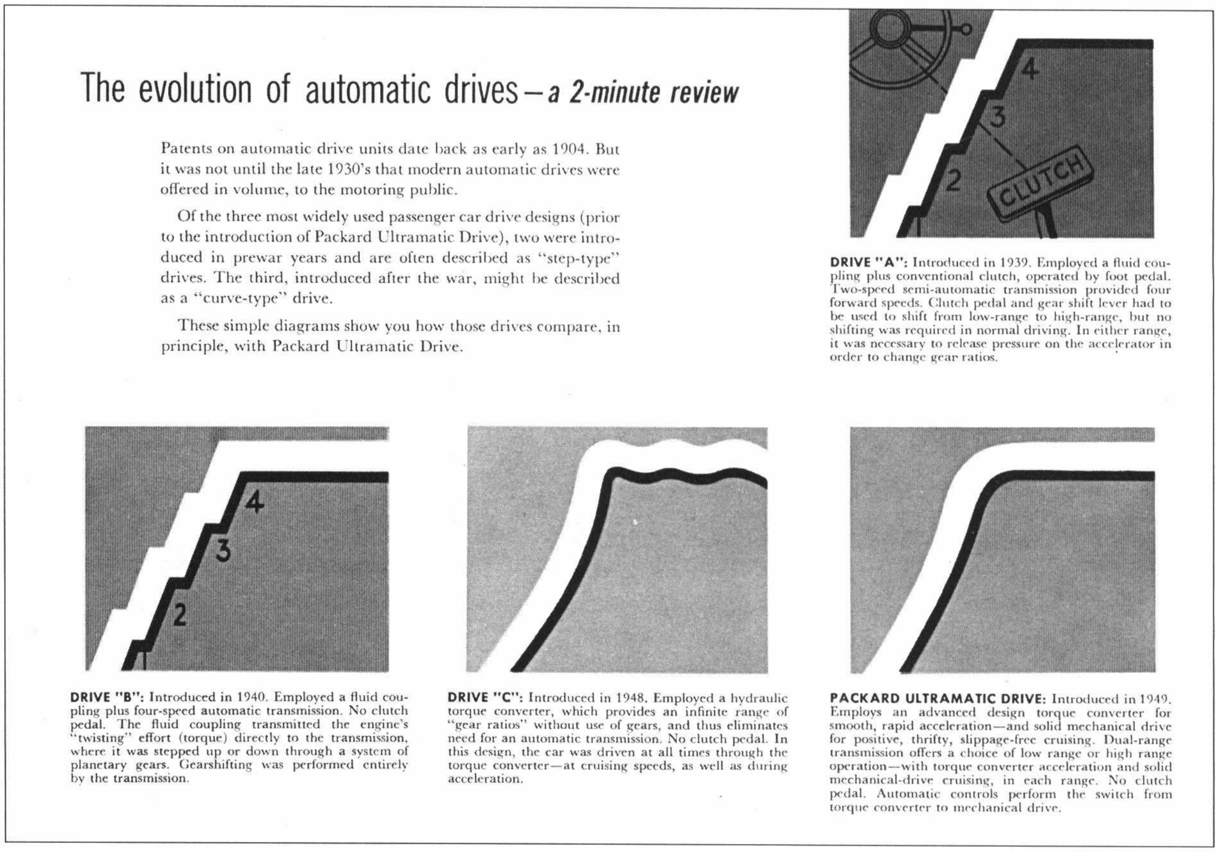


Fig. 12 – Studebaker's 1950 Borg-Warner-designed torque converter transmission. The exploded view shows the third vaned wheel, or "stator," which rotates independently and multiplies torque. This third wheel is typical of all torque converters and is what sets them apart from a fluid coupling. Later torque converters sometimes added additional stators. The toothed ring seen on the assembled torque converter is the engine flywheel (supplied by the author).



The evolution of automatic drives—*a 2-minute review*

Patents on automatic drive units date back as early as 1904. But it was not until the late 1930's that modern automatic drives were offered in volume, to the motoring public.

Of the three most widely used passenger car drive designs (prior to the introduction of Packard Ultramatic Drive), two were introduced in prewar years and are often described as "step-type" drives. The third, introduced after the war, might be described as a "curve-type" drive.

These simple diagrams show you how those drives compare, in principle, with Packard Ultramatic Drive.

DRIVE "A": Introduced in 1939. Employed a fluid coupling plus conventional clutch, operated by foot pedal. Two-speed semi-automatic transmission provided four forward speeds. Clutch pedal and gear shift lever had to be used to shift from low-range to high-range, but no shifting was required in normal driving. In either range, it was necessary to release pressure on the accelerator in order to change gear ratios.

DRIVE "B": Introduced in 1940. Employed a fluid coupling plus four-speed automatic transmission. No clutch pedal. The fluid coupling transmitted the engine's "twisting" effort (torque) directly to the transmission, where it was stepped up or down through a system of planetary gears. Gearshifting was performed entirely by the transmission.

DRIVE "C": Introduced in 1948. Employed a hydraulic torque converter, which provides an infinite range of "gear ratios" without use of gears, and thus eliminates need for an automatic transmission. No clutch pedal. In this design, the car was driven at all times through the torque converter—at cruising speeds, as well as during acceleration.

PACKARD ULTRAMATIC DRIVE: Introduced in 1949. Employs an advanced design torque converter for smooth, rapid acceleration—and solid mechanical drive for positive, thrifty, slippage-free cruising. Dual-range transmission offers a choice of low range or high range operation—with torque converter acceleration and solid mechanical-drive cruising, in each range. No clutch pedal. Automatic controls perform the switch from torque converter to mechanical drive.

Fig. 13 – How Packard promoted the "advantages" of its 1950 "Ultramatic Drive" over the competition (from the editor's collection).

The Spread of Hydra-Matic to Pontiac and Non-GM Cars

In 1948, Pontiac began using Hydra-Matic. Thus, four out of five General Motors U.S. car divisions were now offering a fully automatic transmission while no other make of car yet had one. By 1949, the postwar automotive sellers' market was beginning to taper off and the competitive pressures were returning. It was clear that every car builder would need to have an automatic transmission . . . and soon. But designing, tooling, and building a fully automatic transmission from scratch was a major challenge. In many ways, an automatic transmission was more complex than an engine. It was a burdensome expense especially for a small independent manufacturer. One way to avoid that expense was to buy a proven transmission from a competing manufacturer.

In spite of the blow to corporate pride, several car makers went that route. Ford Motor Company was first to bite the bullet and began buying Hydra-Matics for Lincolns from arch-rival GM during the 1949 model run. Nash began offering Hydra-Matic on Ambassadors in 1950, and extended availability to the Statesman in 1951 and Rambler in 1953. Nash added its own twist: "Selecto-Lift" starting. The starter was actuated by pulling the shift lever toward the driver when in neutral position.

After years of going its own way with various semi-automatic power-shifting devices, in 1951, Hudson began offering Hydra-Matic on Commodores and the hot new Hornet. The semi-automatic Drive-Master (named "Super-Matic" when overdrive was added) was offered for one more year on the lower-priced Supers and Pacemakers. Kaiser and Frazer adopted Hydra-Matic in 1951, and with the acquisition of Willys Motors in 1953, began offering Hydra-Matic on the Willys Aero. That brought the number of makes using Hydra-Matic to an all time high of eight (Frazer had been discontinued after 1951).

In 1951, Hydra-Matic was modified to permit easier shifts in and out of reverse so cars could be rocked when stuck. In 1952, Dual Range Hydra-Matic appeared with two "Drive" positions. The second Drive range position could be selected to hold the car in third gear for driving in congested traffic.

Automatic Transmissions from Studebaker and Packard

The year 1950 saw several new transmission designs come to market. Independent manufacturers Studebaker and Packard each developed their own, and these were ambitious efforts indeed for two small companies. Both used torque converters, and both introduced automatic gear assist in drive range to give better acceleration than Dynaflow. They were two-speed transmissions in drive range, and low range could also be selected and held. Both also introduced an automatic lock-up into direct drive when cruising speed was reached, thus eliminating the slippage that bothered Dynaflow users. Studebaker used a double-width brake pedal for the first time permitting left-foot braking, something that remains controversial today (Fig. 11). Studebaker's transmission was developed in conjunction with Borg-Warner and was air cooled, another innovation (Fig. 12). Other automatics up to this time were water cooled and had to be connected to the engine cooling system. Studebaker called its transmission "Studebaker Automatic Drive" in a refreshing contrast to all of the fanciful made-up names of competitive transmissions.

Packard named its transmission "Ultramatic" (Fig. 13). Although it was developed independently of Studebaker, it is interesting that it was so similar in features and design to Studebaker's, especially since the two companies would merge in 1954. Had that been known in 1949, much development effort might have been shared.

Chevrolet's Powerglide Transmission

The biggest transmission news for 1950 came from Chevrolet. It was the first automatic transmission in the low price field, and the last GM car to go automatic. Chevy's new transmission was called Powerglide, and it followed the Dynaflow model: a torque converter with no gear assist in normal driving. It would appear that there were two schools of thought within General Motors as to transmission design. One faction favored the swift gear-assisted acceleration of Hydra-Matic; the other, the smooth unbroken power flow of Dynaflow. Chevrolet was obviously in the Buick camp. Powerglide had some differences from Dynaflow, but in concept and operation it was the same. In promotional materials, Chevy emphasized that Powerglide provided an "infinite number of power ratios—without gears." It sounded like an ad for the long forgotten Buick roller transmission. There was a planetary low range which could be selected for heavy going. Chevrolet even recommended using it if you wanted "a faster getaway." The car could be rocked when stuck. But there was a clue that perhaps Powerglide soaked up some power. When Powerglide was ordered, it came with a 235 CID Chevy truck engine developing 105 bhp instead of 92 bhp from the standard 216 CID 6-cylinder engine. Hydraulic valve lifters were included on the engine of vehicles with Powerglide to quiet engine noise on acceleration, when the driver's attention would no longer be diverted by gears shifting. But vehicles with the larger engine and Powerglide had all they could do to keep up with vehicles equipped with the smaller engine and manual transmission. Powerglide was generally satisfactory with no unusual problems reported in service. But drivers soon reported the same sensation of slippage and slow acceleration that Dynaflow had inspired. Many drivers fell into the habit of routinely engaging low range for all acceleration. Others referred to the new transmission as "powerslide" and "powerslip." As a result, in 1953 Chevrolet turned Powerglide into a two-speed transmission and made low-range starts automatic.

More Torque Converter Transmissions

Torque converters were now the preferred form of fluid coupling in new transmission designs. In 1951, Ford introduced Fordomatic (Merc-O-Matic on Mercurys). It was also designed with some help from Borg-Warner and was a three-speed automatic with torque converter in normal drive range. It normally started in second unless the driver manually selected "L." This transmission lacked some of the features of the Studebaker Automatic Drive, most notably the direct drive lock-up feature. However, gear-assisted starts reduced the sensation of slippage and as a result direct drives were not widely adopted until decades later. Ford was the first to introduce a modern selector quadrant placing the forward positions to the right of neutral and reverse and park to the left: P R N D L instead of P N D L R. The driver no longer had to go through forward positions to reach reverse.

Even Chrysler began offering a torque converter as an alternative to the fluid drive unit normally attached to the Chrysler semi-automatic transmission. It was then named "Fluid-Torque." But as the '50s wore on, Chrysler products still had a clutch pedal, and still required a tedious pause to shift during every acceleration. And inexplicably, volume leader Plymouth still offered no device at all to reduce shifting. All of the competition offered clutch free, no shift driving, and sales began to show it. Finally, in the middle of the 1953 model year, Plymouth introduced something it called "Hy Drive." This was a torque converter mated to a conventional three-speed manual transmission, a combination resembling the Dodge Fluid Drive arrangement of the '40s. It was too little and too late. Plymouths were still powered only by 6-cylinder engines, and thus the driver either had to accept torpid acceleration or keep on shifting manually. Also in the middle of the 1953 model run, Chrysler introduced PowerFlite in the Imperial line, finally a fully-automatic, two-speed torque converter transmission. The clutch pedal had departed for good. For 1954, all Chrysler Corporation cars offered PowerFlite, although Plymouth didn't get it until the middle of the year. It had been a long wait, but it was an excellent transmission: quiet, responsive, and with very unobtrusive shifts. Two years later, Chrysler introduced TorqueFlite, one of the first three-speed transmissions with torque converters, which moved the Corporation to a leadership position in automatic transmission technology.

Thus by 1955, 15 years after Oldsmobile changed the automotive world with the first Hydra-Matic, every U.S. car builder offered a fully-automatic transmission with no clutch pedal. Already the majority of new car buyers were demanding automatic transmissions in their next car. Ahead lay years of product refinement and evolution. But the principal components that we take for granted today were already well established: multi-speed automatic gearboxes, torque converters, and direct-drive lockup.

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Footnotes

[1]Economists do acknowledge the existence of the "principal-agent problem." This condition exists when management (agents) operate a corporation in their own interest at the expense of the stockholders (the principals). Often when the "principal-agent problem" exists, managers will try to maximize their own returns (salaries, bonuses, stock options) while keeping stockholders simply "satisfied" with a reasonable level of profits (Pindyck, 627-632). The "principal-agent problem" in the Studebaker-Packard case in late 1956 through 1958 did not exist because the evidence discussed in this paper suggests management was actively attempting to save the firm and preserve value for stockholders. Whether or not those attempts were ultimately successful or strategically sound does not detract from the intent of preserving stockholder value.

[2]As shown in Table 3, the direct-labor-hours-per-vehicle spread for the company was great in 1958 from 48 hours for the Studebaker Scotsman to 83 hours for the Packard Station Wagon. With the elimination of the Packard and Golden Hawk lines and with the introduction of the Lark for 1959, the direct-labor-hours spread narrowed from 44 to 60 hours (Minutes, Mar. 27, 1958).

[3]Churchill's cost-cutting efforts and the benefits of retrenchment and consolidation at South Bend are evident here when compared to the Studebaker break-even estimates of 208,747 units in 1955 (Minutes, June 20, 1955).

Hudson Goes its Own Way

Hudson almost deserves a chapter to itself, to describe the various devices it offered over the years to, first, make shifting easier, and later, reduce shifting. All of these devices used external vacuum cylinders to shift manual transmission gears and operate the clutch, actuated by electric switches governed by accelerator position and engine speed. This is what Hudson was up to in the '30s.

In 1935 as free wheeling and automatic clutches were fading from the scene, Hudson introduced the "Electric Hand" pre-selector gear shift developed in conjunction with Bendix. An option on all Hudsons and Terraplanes, it consisted of an "H" pattern shifting switch mounted on the end of a rigid arm extending from the right side of the steering column (in the same location that column shift levers would later occupy). The shifting switch, a small vertical lever about two inches long, could be moved at any time to select a gear, but the actual shift did not take place until the clutch pedal was depressed. Thus, gear changes could be "preselected," hence the name (Fig. 14).

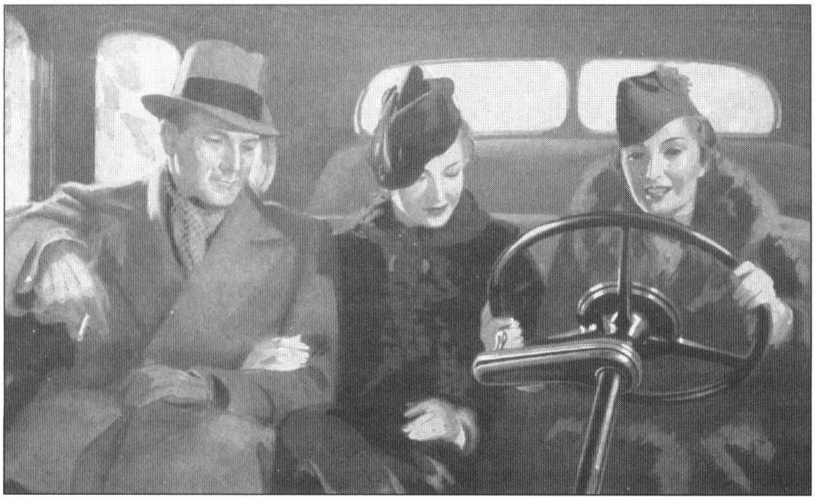

Fig. 14 – The "Electric Hand" as installed on 1935 Hudsons and Terraplanes (from the editor's collection).

The same device also supplied by Bendix was used the next two years on the Cord 810/812 and proved to be as troublesome on the Cord as it did on the Hudson. But the Cord had little choice: being front-wheel drive, the transmission was in front of the engine, a long way from the driver. There was no easy alternative way to reach the gears to shift them. Hudson on the other hand, supplied a floor shift lever that could be inserted into a socket on top of the gearbox when the owner "chose" (or was forced) to shift. Not exactly a vote of confidence in the durability of the Electric Hand. Shifting was accomplished by electric actuation of vacuum cylinders to move each of two shifting forks in coordination. When it was working, however, the Electric Hand permitted a clear front compartment floor as Hudson chose that time to relocate the parking brake handle to the left cowl under the dash. In 1936, Hudson's corpulent new body design with a front seat 55 inches wide, coupled with the removal of the gear shift lever from the center of the floor, made it possible to advertise with some credibility that the Hudson front seat was wide enough for three persons. Virtually every other manufacturer made that claim in the late '30s, especially after adoption of steering column mounted gear shift levers cleared the front floor of obstruction. But Hudson was the first to remove the floor shift, and for years Hudson front seats were among the widest in the industry.

Hudson had offered an automatic clutch as an option since 1932. After the arrival of the Electric Hand, Hudsons could be ordered with either or both. Combining both automatic clutch and Electric Hand created a real witches' brew of switches and vacuum cylinders. On Hudsons equipped with both devices, to actuate the shift after pre-selecting the gear, the driver simply let up on the accelerator pedal. The clutch would then disengage by itself and the gears would shift. Hudson named this "Selective Automatic Shift" starting in 1937 and nothing like it was offered by any domestic competitors. To be sure, automatic clutches had been offered by several marques before 1935, but had been dropped. Unlike Hudson, none of these earlier clutches did any shifting of gears. Hudson used the same type of automatic clutch as the earlier ones: an electrically-actuated vacuum-powered mechanism to declutch whenever the throttle was released to permit shifting or bringing the car to a stop. Then when the driver again applied some throttle, increasing rpm told the clutch to engage, and away the car went hopefully without too much of a jerk.

Starting the car from a dead stop was where things got a bit raggedy, especially as the clutch developed wear. Here, Hudson had a distinct advantage: a cork-faced clutch plate running in an oil bath, a mysterious substance known to the outside world only as "Hudsonite." (The formula was a closely-guarded secret, and no substitute oils were sanctioned by Hudson.) This was notably smoother and enabled Hudson to use the automatic clutch long after virtually all other makes had abandoned the device. Hudson continued to use the cork clutch into the '50s on all cars equipped with manual gearboxes.

Hudson also continued to offer the automatic clutch as an option even after it discontinued the Electric Hand in 1940. It became an essential component of Hudson's semiautomatic shifting arrangement first introduced in 1942 as "Drive-Master" and continuing through 1951 under that name, and as "Super-Matic" when equipped with overdrive. Imagine the maze of wiring, switches, and vacuum lines and cylinders when Super-Matic was ordered! All of these devices had mechanisms and electric switches exposed to road dirt and weather, and thus required frequent servicing. They all developed a reputation for unreliability and tarnished Hudson's reputation. But they all had one saving grace: when the car owner grew tired of repairs, the device could be switched off and forgotten!

Author's note: Transmission and other trade name spelling, punctuation and capitalization are all taken from the manufacturers' sales literature and advertisements. Occasionally, the manufacturer changed punctuation over time. In such cases, I have used the style used when the name was first introduced.

Alfred P. Sloan, Jr.: The Prescient Organization Man

by Jace Baker and Pat McInturff

Alfred P. Sloan, Jr.

Introduction

Given its past success and current challenges, General Motors Corporation (GM) is certainly a worthy subject of study for automotive and business historians. There are actually four tales to be told: the story of the bloated dysfunctional giant of recent years; the monolith that preceded it; the entrepreneurial firm assembled by William C. Durant; and, finally, the subject of this paper, the company's evolution from Durant's collection of pieces to an empire. Unfortunately, the dynamics of GM's ascendancy have largely been lost to researchers (partly by the company's intent). The tale is one of brilliant managerial innovation starring two powerful characters: William C. Durant and Alfred P. Sloan, Jr.

It would be hard to imagine two individual business giants being more dissimilar. Though seldom mentioned in modern business textbooks, Durant must be regarded as a legend in the annals of entrepreneurship. Building by acquisitions Durant assembled an amalgam of companies and distribution channels that formed the backbone of GM. What he did not achieve was a well developed, integrated organizational structure that would insure the viability of his dreams. That would be the task for Alfred Sloan.

The transition of GM from entrepreneurial cacophony to titanic symphony was engineered by Sloan, arguably one of the more valuable of Durant's acquisitions, who arrived from Hyatt Roller Bearing where he had achieved a successful turnaround.

The romantic automotive cognoscenti may lament the transition from the colorful entrepreneurial wheeler dealer Billy Durant to the buttoned-down visage of Pierre S. du Pont, and, later, the starchy, taciturn Alfred P. Sloan, Jr. Unfortunately, business historians have been a bit unfair to both Durant and Sloan. For the most part, Durant has been relegated ignominiously to the historical scrap heap. Sloan's fate has been only slightly more positive: imperious in photos and ponderous in his autobiography, he comes across as a rather lackluster "suit" to those with a casual familiarity with his career.

Yet it was Sloan who, in a mere 20-page document titled the "Organizational Study" in 1920, laid the foundation for GM's well-being for the following four decades. Further notions of organizational theory and managerial strategy would be intricately integrated into a framework that would, to a great extent, define the world of business and the academic field of management during the 20th century.

While Sloan is clearly the person who brought corporate discipline to the chaotic Durant empire, what is lost to many in our ahistorical age is the extent to which Sloan preceded "modern management" by several decades. This discussion will focus on four modern management theories that are seemingly rooted in Sloan's four "studies." These in order are: 1) consensus, decision making via committees; 2) forecasting; 3) segmentation; and 4) distributed scale economies.

The Crisis of 1919-1920 and the "Organizational Study"

William Crapo Durant began his business career at the age of 17 toiling in his grandfather's lumber mill and garnering an introduction to the world of business. From these beginnings he encountered a series of relatively ordinary jobs, yet the process of experiential learning stood him well and laid the foundation for his entrepreneurial genius. Following a stint reviving Flint's failing water-supply company, Durant entered the world of manufacturing, and in partnership with J. Dallas Dort created the Durant-Dort Carriage Company, which in a relatively short time was to become the largest company in its field.[1]

The pending failure of Buick Motor Company (1903) was brought to the attention of Durant who rose to the challenge and within 48 hours of taking the reins was able to raise a half million dollars through his good name and networking. The turnaround of Buick during the period of 1903-1907 laid the basis for the profits that he used to acquire several automotive manufacturers, including Cadillac and Oldsmobile. The vision of a motor vehicle empire was fully launched in 1908 with the formation of General Motors. However, the euphoria was short lived and Durant was ousted in 1910, to begin his vision anew. By 1916, using Chevrolet as a strategic basis similar to Buick earlier and stock trading tactics that would make modern trading mavens envious, Durant regained control of his precious GM with a healthy dose of DuPont support. He commenced the expansion strategy of the early years with renewed vigor. Fortuitously, at least for GM, one of the companies he acquired was Hyatt Roller Bearing and its president and principal share holder Alfred P. Sloan, Jr. Sloan took a substantial portion of his payment in the United Motors stock created by Durant to buy Hyatt, along with Delco and several other firms.

Alfred Sloan had started on the lower rungs of Hyatt after his graduation from MIT. After a short absence he returned to Hyatt in 1898 with a financial stake provided by his father and another investor. The coming of age of the automobile provided a market for the bearings along with an introduction to the world of automobile manufacture. Having taken Hyatt from near bankruptcy and turning it into an extremely efficient precision manufacturer, the confluence of engineer/entrepreneur made Sloan uniquely prepared to lead United Motors. Perhaps he wasn't so well prepared to comprehend the seemingly chaotic managerial environment surrounding the ever-in-motion Billy Durant.

Durant's general lack of functional organization focus was coupled to his increasing the growth of GM at a very intense rate. The impact of these factors was incapacitating for some of the key executives—Walter Chrysler, for one, exited in 1920. Responding to the burgeoning problems and as part of his membership on the executive committees, in late 1919 Sloan drafted a tract titled the "Organizational Study" that was submitted to Durant but with little effect other than a general "well done." The crisis continued, inventories rose, stock prices plummeted, and on November 30, 1920, Durant resigned, his empire permanently lost. A month to the day after Durant's departure Sloan revised the "Organizational Study" that Durant had ignored and presented it to new president Pierre S. duPont and GM's board of directors, which adopted it unanimously.

The interplay of the exits of Durant and the ascendancies of duPont and Sloan, while high drama, are probably the most poorly documented upheavals in the annals of business history, particularly given its significance. There can be little debate that Alfred Sloan created the processes that resulted in the GM juggernaut that began in the 1920s and emerged as the most powerful corporation in the world for several decades. Although not covered in this article, there are two debates that must be addressed in any assessment of Sloan's accomplishments. First, although it is inarguable that Durant put together the pieces of the modern GM, there is substantial room for debate as to whether he had a plan for ultimately consolidating and coordinating his holdings; and whether he had the talent and temperament for managing such an enterprise.

A second source of disagreement is the degree to which Sloan developed his views of organizations and their processes via the tutelage of Pierre duPont. Historian Alfred Chandler's view is that Sloan probably did not develop many of his thoughts on operation of a multidivisional enterprise from duPont because the DuPont organization, although one of the first multidivisional firms, focused on dissimilar commercial products while GM marketed consumer products that could be differentiated.[2] Regardless of its possible inspirations, the success of Sloan's tenure at GM is perhaps unrivaled in business history. Eight and one-half decades after its emergence, the view here is that at least four of the Sloan team's management techniques continue to have relevance for today's state-of-the-art organizations.

Committees / Consensus Decision Making

Our present interest in Sloan's GM came from a fascination with Sloan's ability to manage a complex enterprise by way of extensive use of committees. At one time or other during the Sloan years the firm used committees to develop policies for virtually all of the enterprise, including operations, sales, finance, purchasing, advertising, research, development and patents, and management of interdivisional relationships. While using committees to operate organizations probably never enjoyed widespread favor, the manner in which they were employed at GM is quite congruent with two "sophisticated" modern techniques: matrix management and management by consensus.

Matrix management has been used for decades to coordinate complex projects, such as those found in heavy construction and aerospace. It is named for the manner in which individuals and/or groups with specialized knowledge are deployed to address the needs of the project at hand. An illustration of the concept is provided in Figure 1.

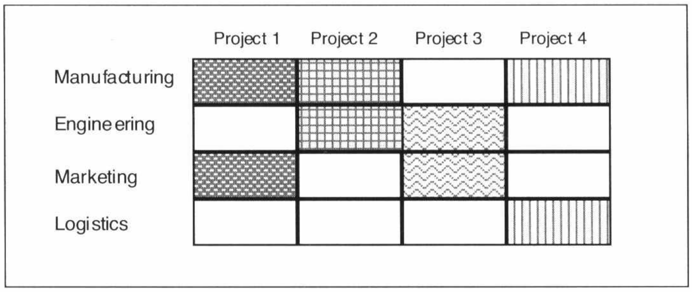

Fig. 1 – Matrix Management

On its face, matrix management is quite simple: teams are developed to address issues relevant to specific needs of an organization. A matrix (often called a 'cross functional team' in modern usage) offers several potential advantages:

- Flexible sharing of human resources across products, departments or divisions.
- Suited to complex decisions and frequent changes in unstable environments.
- Provides opportunity for both functional and product skill development.
- Facilitates development of team building and participation skills.
- May improve coordination and produce superior outcomes in less time.

As the differences between Japanese and American management styles garnered more scrutiny and interest by American managers and academics during the moribund early

1980s, the concept of consensus management tended to move observers into two camps. The GM committee system also resembled a hallmark of "Japanese management"[3,4]—management by consensus.

Detractors, perhaps most notably Lee Iacocca, who, not surprisingly, had a preference for more hierarchal decision making, felt that the concept was an artifact of the cautious, non-confrontational nature of Japanese culture and a cause for the tendency of Japanese firms to copy rather than invent. Proponents felt that the process of garnering consensus (cross-functional teams meeting to address all aspects of an issue) was at least as important as the actual decision because it created an open forum for debate and educated participants on the background of the decision.

A quick examination of Sloan's GM and the one of today suggests that both camps were, to some extent, correct. Although specifics of Sloan's management style are elusive, the sparse anecdotal evidence suggests that he was as inscrutable as the most stereotypical of Japanese managers. It also appears that he was quite methodical in his approach to problem solving (as one might expect from an MIT-trained electrical engineer), comfortable with complexity, and quite patient when the situation required it—another "Japanese" trait.

The paucity of information about the practice of management under the Sloan regime is at once intriguing and frustrating. One challenge for the historian is that the field of management was in its infancy in Sloan's time and writers in the popular business press would have lacked the academic foundation to develop a deeper analysis. Drucker claimed to have had unprecedented access to GM but his *Concept of the Corporation* offers a rather superficial look into the organization. Sloan's book was meticulously researched but its focus was more on the history of the corporation than leadership techniques. Alas, for contemporary historians there appears to very little information available. Concerned with antitrust regulators, GM expunged much of its archives. Sloan did not leave papers. The research from Sloan's book is in the papers of John McDonald but they reflect the focus of the book.

Forecasting

Durant had the good fortune of guessing the market's direction earlier in his career and had the mindset to follow his intuition and not develop the more scientific approaches to managing the business that Sloan later employed. It may be argued that this inability to develop accurate forecasting procedures ultimately cost Durant his control of GM in 1920.[5]

One of the challenges of the Durant/du Pont/Sloan era was that of phenomenal growth in an industry with little meaningful history. In the absence of lessons from their industry, these pioneers had to either develop their theories from classical economics, such as Adam Smith's discussion of the pin factory. This would appear to be unlikely for this triumvirate as well as for Ford. It appears similarly unlikely that these managers would have borrowed lessons from other industries, such as railroads, where, it might be argued, some of their cost accounting concepts may have emerged.[6] It is clear that some cost accounting concepts came from du Pont (Raskob and Donaldson had worked there with Pierre du Pont). Still, most of the lessons came inductively. All three had had success in some form of manufacturing: Durant in wagons; Sloan at Hyatt Bearings, and, to a limited extent at the time of his promotion, GM; and du Pont with Du Pont Chemical.

It is easy to lose sight of the fact that in addition to the challenge of creating viable forecasts in a rapidly evolving industry, the early leaders were faced by poorly understood volatility in the overall national economy. This exogenous uncertainty further compounded the challenge of forecasting demand, production, and financial performance.

A third difficult issue with forecasting was the nature of distribution in the industry. Several factors were at work. Economies of scale had worked in consort with growing demand to create a bit of an economic perpetual motion machine. In order to preserve cost discipline, Ford and Durant pursued vertical integration strategies, although in different ways. Ford developed parts manufacturing capabilities, while Durant pursued a similar strategy through acquisitions, which had worked for him successfully in the wagon business. It is somewhat ironic that the vertical integration strategy had not been pursued in distribution. In the embryonic stages of the industry's emergence, establishing a dealer network saved cash-strapped manufacturers the risk and expense of operating far flung sales operations. As the industry expanded, the challenge of maintaining (or, in the case of GM, increasing) market share again required the full attention of the organization.

Integration, both vertically and horizontally, would become, by way of anti-trust laws, the bane of GM while continuing to plague du Pont. Eventually the courts would require du Pont to divest its GM holding. However, it is doubtful that Sloan was overly concerned about anti-trust issues during the late winter months of 1920. His preoccupation surely had to be getting GM running smoothly and efficiently.

Unfortunately, this bifurcated distribution system, which relied on independent contractors (dealers) to purchase product from manufacturers and create demand in their local markets revealed a critical flaw in the supply chain there were significant time and information lags between actual sales to consumers, dealer orders to the factories, and eventual shipments to the dealers. This was hardly a problem in 1907 when production for the industry was 43,000 units. However, by 1915 when monthly production was almost 755,000, fissures in the business models of manufacturers became both more apparent and critical.[7]

As production increased and the huge manufacturing facilities required to achieve economies of scale cranked out vehicles at a rate not previously seen, the ability, with its associated risks, of manufacturers' capacity to flood dealers with cars became exponentially greater. Blind to the sales activities of their dealers, manufacturers were also essentially blind to consumer demand. This created something of an endogenous boom-and-bust cycle which periodically crossed paths with the nation's exogenous cycle, which in the summer of 1920 created an economic "perfect storm." The list of potential responses was at once short and unpleasant: shutter plants temporarily; pressure dealers to accept cars for which they did not have ready buyers, or provide expensive financial incentives to dealers to increase their orders.

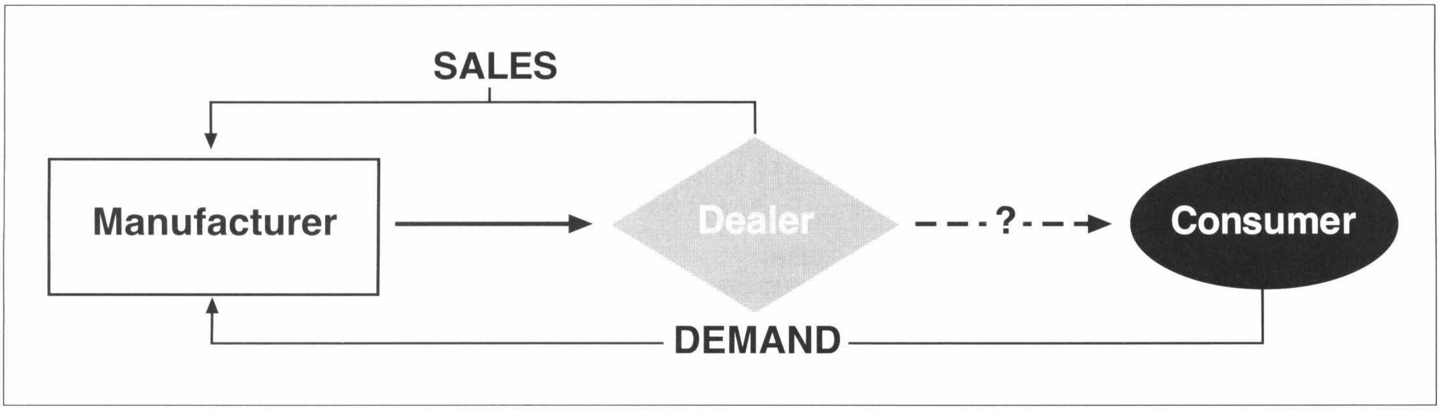

Fig. 2 – Consumer Forecasting

Absent Durant, Team Sloan worked to develop a feedback loop from GM dealer retail sales to project future product demand and thereby to adjust production schedules, materiel orders, and shipments to dealers. The system evolved from annual end-of-year forecasts with triennial updates in 1922 to monthly forecasts to an ongoing series of ten-day forecasts by 1925.[8]

While the forecasting techniques may seem crude by 21st century standards, a few points should be kept in mind. GM's dealer feedback data was compiled in the absence of reliable phone systems, fax machines, spreadsheets, and e-mail. Although the ten-day time period likely reflected some of the logistical challenges of the day, it also took much of the day-to-day volatility out of the market while reflecting seasonal variations in the market. More importantly, Sloan's team had discovered how to use speed to create much more accurate forecasts.

For example, a firm using annual forecasts with a 20 percent variance and producing one million units per year would miss its forecast by 200,000 units, either missing sales opportunities because it could not ramp up production or flooding the market with 73 days of excess inventory. A 20 percent variance in a ten-day forecast at the same production levels would miscalculate need by a much more acceptable 5,556 units.

To bring the issues up to current times, two additional points are in order. First, the problem of periodic overcapacity and concomitant overproduction and surges in factory and/or dealer inventories continues to plague the industry. Second, the vaunted Toyota production / distribution system relies on an ongoing series of monthly, weekly, daily forecasts; little different than the GM system of the 1920s.

Segmentation

Perhaps Sloan's most famous contribution to GM was his Organization Plans of 1920-22. Arguably, his signature piece was the proposal for six distinct product price segments. At the time of the plan, GM was an amalgam of Durant's acquisitions with little coordination and no coherent marketing direction. Although copies of Sloan's 1919 memo to Durant appears to have been lost to history, a pointed 1921 memo to the Executive Committee of GM's board proposed the vehicle price segmentation scheme outlined in Table A.

Table A

Sloan's Vehicle Price Segmentation Scheme[9]

A	$450 — $600
B	$600 — $900
C	$900 — $1200
D	$1200 — $1700
E	$1700 — $2500
F	$2500 — $3500

In hindsight, the segments appear to be rather intuitive (and probably did at the time). What is impressive is the insight and courage to develop and implement the segmentation strategy at a critical period in GM's evolution. It is doubtful that the label of entrepreneur is easily applied to Sloan, yet in this case the adjectives do seem appropriate.

There is another element to Sloan's segmentation scheme that appears to be ignored by most commentators and that is the role of value and quality. Instead of aiming at the center or bottom of a defined segment, Sloan priced his product near the top. However, the underlying driver of the strategy was the addition of quality and value for the price. In the case of Chevrolet, Sloan was not driven to the strategy of extreme cost/price reduction—rather he could hold the price above Ford by adding value to the car. An interesting side note and irony to this strategy is that it is quite similar to the strategy used by Honda and Toyota to gain market share over the last several decades.

Distributed Scale Economies

Our view is that Sloan's final prescient contribution to the industry was his richer insight into scale economies – what Chander termed almost 70 years later "economies of scope."[10] Henry Ford's business model was quite rudimentary: select a potentially high volume segment; pare the product line to barest bones; reduce costs via vertical integration and pressuring suppliers; and pass the reduced production costs to customers, thereby increasing demand for the product and creating new scale opportunities.

Sloan had close knowledge of Ford's concept, having been a supplier when he was at Hyatt, making small production runs to satisfy fledgling manufacturers.[11] At some point he must have

Table B

Minimum Efficient Scale in Different Parts of the Auto Industry[13]

Activity	Volume of Production Required to Achieve Minimum Production Costs
Casting of engine blocks	1 million
Casting of other parts	100,000 – 750,000
Power train machining & assembly	600,000
Axle making & assembly	500,000
Pressing of various panels	1-2 million
Painting	250,000
Final assembly	250,000
Advertising	1 million
Finance	2-5 million
R&D	5 million

realized the need to create spillovers in this small-batch production—using elements of one order (machine setup, for example) to create a similar but different product for a different order.

Sloan understood that scale could be found beyond Ford's simple application of the concept. As an electrical engineer and former president of his own company, he would have been quite comfortable with the arithmetic of production economics. He understood two things about scale that apparently either had not occurred to Ford or that he simply chose to neglect. First, Sloan understood that different parts and processes would have different economies, as the modern example in Table B illustrates. Second, he understood that at a certain point the experience curve flattened out and subsequent increases in volume would yield negligible incremental improvement. He made this point in his book when discussing purchasing strategy.[12]

Ford's obsession of increasing production with concomitant price reductions was logically flawed, as he eventually learned with the River Rouge complex; at some point costs stopped decreasing with growing production and actually started increasing. In summary, Sloan's approach towards economies of scale and scope, coupled with market segmentation, laid the foundation for GM's market dominance and today's concept of "platforming" in the production function.

Summary and Conclusion

It is frequently said that history is a story well told. Perhaps it should be added that the well-told story should have resonance in the present. The innovations of Sloan and his team certainly meet that criterion. Few documents in business have the power of Sloan's concise yet conceptually elegant Organization Study, which outlined the tensions that managers must consider in creating a functional decentralized organization. Similarly, GM's ability to utilize matrix concepts to create a highly functional committee-driven organization, operationalize scale-driven production and marketing in a manner much more sophisticated than anything prior to their time, and develop equally prescient forecasting and feedback systems is perhaps most impressive when viewed in the context of present day "state of the art" business practices.

One story that emerged from this research that may potentially be "well told" appears from attempting to appreciate Sloan's foresight. There are intriguing links to the lineage of Toyota's modern "system." As discussed in this article, many elements of Sloan's system were remarkably similar to "Japanese" approaches to organization. It is known that Toyota copied the Chrysler Airflow in designing its first production automobile and that GM had assembly plants in Japan prior to World War II. While there is much more research to be done, at this early stage it is certainly plausible that Toyota's widely acclaimed system is actually a copy of the very game plan that GM expunged.

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Footnotes

[1]Harvard University Special Collections, papers of Alfred D. Chandler, Jr., box 28, file 20.

[2]Interview with Alfred D. Chandler, Jr., Cambridge, Mass., March 8, 2006.

[3]Ouchi, W. G.; *Theory Z: How American Business Can Meet the Japanese Challenge* (Reading, Mass.: Addison-Wesley, 1981).

[4]Liker, J. K.; *The Toyota Way* (New York: McGraw-Hill, 2004).

[5]Cray, E.; *Chrome Colossus* (New York: McGraw-Hill Co., 1980), 159-162.

[6]Chandler, A. D.; Jr.; *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass.:The Belknap Press, 1977).

[7]Chandler, A. D. Jr.; *Giant Enterprise: Ford, General Motors and the Automobile Industry* (New York: Harcourt, Brace, & World, 1964), p. 4.

[8]Sloan, A. P. Jr.; *My Years with General Motors* (Garden City, NY: Doubleday, 1963), 129-136.

[9]Sloan, p. 67.

[10]Chandler, A. D., Jr.; *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, Mass.: The Belknap Press, 1990).

[11]Pelfrey, W.; *Billy, Alfred, and General Motors* (New York: AMACOM, 2006).

[12]Sloan, p. 103.

[13]Dicken, P., *Global Shift: The Internationalization of Economic Activity*, 2nd ed. (New York: The Guilford Press, 1992), p. 280.

Abstracts of Other Papers Presented

Our Town's Crown Jewel: A Vehicle Assembly Plant

by Thomas A. Adamich

Fig. 1 – The 1908 Jewel of Massilon, Ohio (from the editor's collection).

American vehicle manufacturers—one of the largest industry sectors in the United States – have been fortunate to be viewed as valued additions to a community's economic, social, and political structure. Historically, the dynamic interactivity of these three factors has determined not only the selection of a vehicle manufacturing (i.e. "assembly") plant's location but also has proven to be the prime predictor of the plant's success in each area. In analyzing the interactive nature of the vehicle manufacturing plant location, several questions arise:

- Which factor (economic, social, political), if any, dominates the decision-making process?
- Have these factors always functioned this way?
- Has the "globalization of the vehicle manufacturing industry" affected the assembly plant location decision-making process?

I will attempt to answer these questions and explore these issues in a comparison-contrast of two eras in vehicle manufacturing history – the "golden years" of American vehicle manufacturing, 1900-1930 and the "globalization years" of American vehicle manufacturing, 1990-2004, and beyond. Associated with these historical time periods will be an analysis of two vehicle manufacturers and their assembly plant location decisions/rationale.

To illustrate the earlier period, I have chosen the Jewel, later Croxton-Keeton, of Massilon, Ohio. (Fig. 1) The president of Jewell (1906-07) and Jewel (1908-09) was Herbert Croxton who was joined by Forrest M. Keeton. In 1909, the men formed the Croxton-Keeton Motor Car Company to manufacture a car by that name, and the Jewel was history. For the later period, I have chosen the Toyota engine-transmission plant in Buffalo, West Virginia. This was a green-field operation that began in 1996. In a county of 5,000 inhabitants, 1,000 of them are employed by Toyota. The dedicated and skilled workforce is in place due to the State of West Virginia's interest in training them. Current volume is 800,000 engines and transmissions a year, for such vehicles as the Toyota Camry and Lexus RX 330.

A professional librarian, Tom Adamich is presently cataloging librarian at Robert Morris University in Moon Township, Pa. An Ohio native, he is a member of SAH. At the third automotive history conference he spoke on "Woodies, Workhorses, and the Wonder Bread Generation: The Rise and Fall of the Station Wagon and the Rise of the Minivan" (abstracted in Review *No. 36), and at the fourth conference, on "Cars and the Tube and the Silver Screen: Automotive Product Placement in Television and Motion Pictures—1950-2002—Social and Legal Implications" (abstracted in* Review *No. 39).*

The Changing Face of Automotive Marketing: Indiana-built Automobiles Serve as a Model of the Evolution of Automotive Advertising

by Dennis E. Horvath

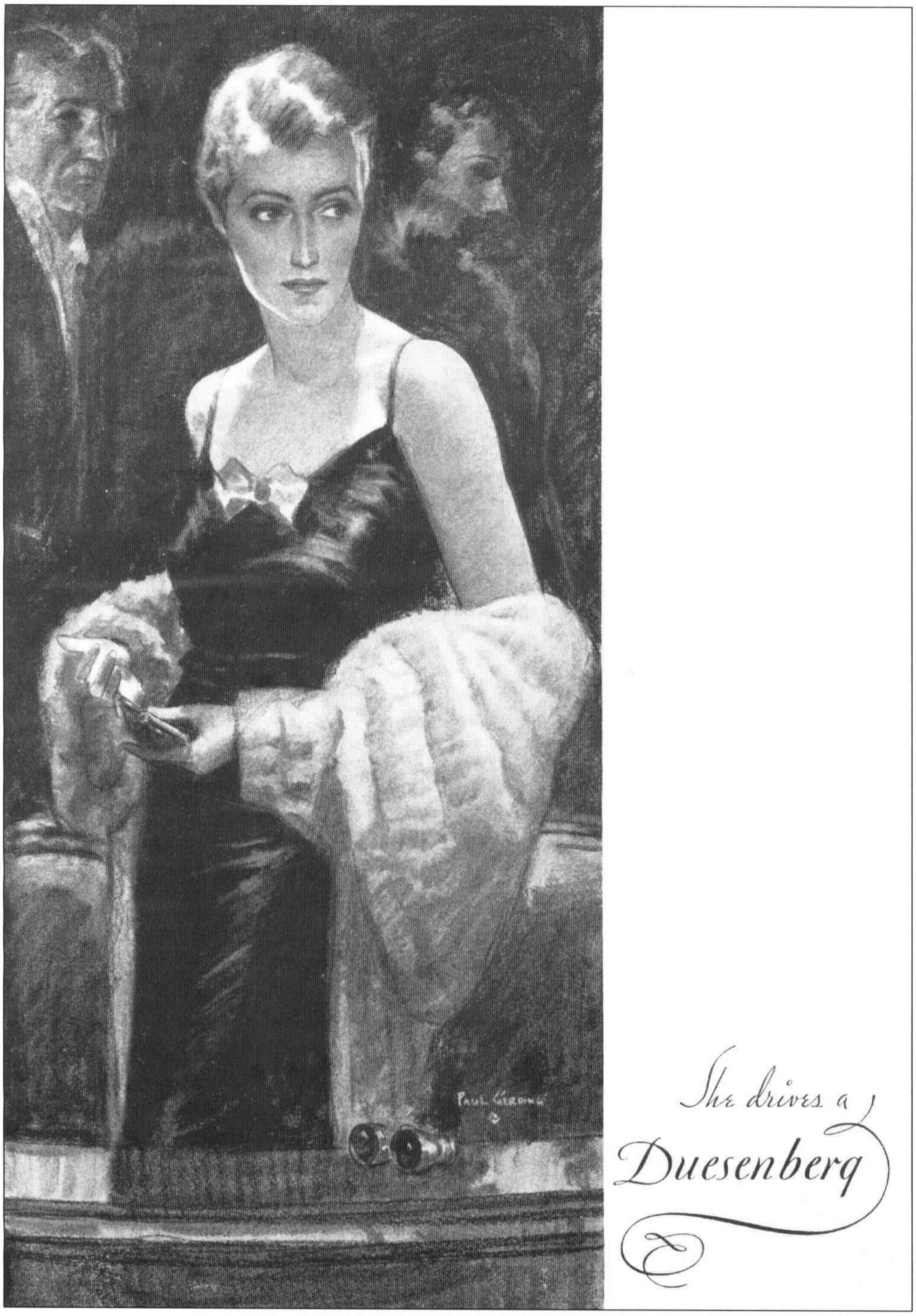


Fig. 1 – From 1935, one of the last Duesenberg ads, focusing on lifestyle rather than the car (from the editor's collection).

Indiana once vied for Michigan's title as the automotive titan of the United States. It was a time when the names of automobiles like Studebaker, Haynes, Auburn, Duesenberg, Stutz, and Cord brought worldwide acclaim to the Hoosier state. Indiana auto production began with Haynes-Apperson in 1898 and continues at four contemporary companies.

This discussion looks at how Indiana-built automobiles served as a model of the evolution of automotive marketing in America, covering the evolution of automotive print advertising, factory brochures, and letters as directed marketing in the first half of the 20th century. Other points included are the development of different styles of advertising and innovations. For instance, Duesenberg was the first in the automotive field to advertise the lifestyle associated with its vehicle instead of focusing on the product (Fig. 1).

We explore how marketing materials are part of the sales process in creating attention, interest, and desire. Another point is that some early auto advertisements made outlandish claims, and how has this practice changed over the years. Finally, we discuss how auto advertising is a good barometer of the health of the economy and marketplace.

I will also look at some of Studebaker's marketing materials from 1902 to 1963.

Examples are their electric autos, "First by Far with a Postwar Car,"(and the Avanti personal luxury car.

In summary, I hope to place Indiana-built automobiles in proper context as a model of the evolution of the American automotive marketing.

Dennis Horvath is a member of SAH and is Lead Author of Indiana Cars: A history of the Automobile in Indiana, and Cruise IN: A guide to Indiana's automotive past and present. He is also Web publisher of Cruise-IN.com: Celebrating Indiana Automotive history. Dennis has presented papers at the 2002 conference ("Studebaker's Centennial: Studebaker Serves as a Model of the Evolution of the American Automobile," Review No. 39, and at the 2000 conference ("Indiana, What Might Have Been"), No. 36.

The Greatest Century:
The Impact of Autos on American Lifestyles

by Donald D. Patterson

The Beginning of a New Century: The Promise of Cars

To understand the vast changes in American lifestyle in the last century we have to return to life in 1900. Life in the cities featured crowded tenements, poor sanitation, and streets clogged with horse drawn traffic and manure. Those who lived in the country were isolated from the larger world. There was no radio or television. While railways predominated, they were inflexible; you went where they went.

Safety bicycles, most popular from 1890 to 1900, afforded a measure of personal mobility. Autos were seen by some as the solution to the problem, but initially they were affordable only by the wealthy. Henry Ford was the first manufacturer to focus on mass production and mass marketing. The Model T, introduced in 1908, was the first car that the working class could afford. It was the first car to become popular in rural areas. Model T's broke the isolation of country life. With the Model T, city folks could drive to the country for fresh air and country folks could go shopping in the city. The age of the commuter had dawned.

The formation of GMAC in 1919 allowed people to finance their new car purchase. Cars evolved from open to closed, from wood bodies to steel. Trucks replaced horse- drawn wagons in the cities. Streets and roads were paved, and after World War I, Americans took to motor travel in increasing numbers. This created a demand for gas, food, and lodging on the road (Fig. 1). Oil companies quickly franchised and opened service stations. Food was provided first in roadside stands, then in drive-in restaurants. Alternatives to lodging in downtown hotels were provided by tourist homes, privately-run auto camps, camp trailers, and cabin camps. These evolved into motor courts and then the motel as we know it today.

Mid-Century Optimism: The Proliferation of Cars and Roads and Dependence on Them

In 1956, President Eisenhower signed the Federal Highway Act, creating the interstate system. This limited-access highway system, coast to coast and border to border, proved to be an important catalyst for economic growth. For some, whose neighborhoods were cut off by or adjoined an interstate highway, it was a mixed blessing.

From the 1950s to the 1970s, suburbs doubled in growth. As the middle class abandoned the cities, businesses followed. Malls replaced downtown stores and, as the money left the cities, urban decay set in. The design of suburbs began to focus more on the car. Sidewalks began to disappear. People drove to and from their houses rather than walking. The car-centered lifestyle led to changes in family dynamics. Parents had limited control over where their teen-aged drivers went. Jack Kerouac's *On the Road*, published in 1957, romanticized cross-country travel as the pursuit of freedom and high adventure. Rock and roll popularized fast cars like the "Little Deuce Coupe." The film "American Graffiti" popularized the car-centered lifestyle of the 1960s.

The fast-food movement was born in 1955 with the opening of the first McDonalds. To reduce labor costs, drive-up windows replaced carhops. The drive-through window concept has been adopted by many businesses including banks.

The 1950s also saw the opening of the first Holiday Inn, and the word "motel" became common. Drive-in theaters came and went. With the exception of the large cities, the American lifestyle had become molded around the car by the 1970s.

End of the Century: Cracks in the Car Culture

In the '70s, several events challenged our thinking about cars. In many cities smog, a visible brown haze, became common. Congress passed the Clean Air Act in 1970. The EPA

Fig. 1 – A couple of happy campers of the 1920s.

began enforcing air standards in cities in 1975. California banned leaded gas in 1975. Emission standards were mandated for cars in 1973. This resulted in drivability problems in many cars. The use of catalytic converters, fuel injection to replace carburetors, and electronic engine management systems, solved most of the early problems.

In 1973, the Arab oil embargo led to the first shortage of gas since World War II. High gas prices and lines at gas stations shocked the nation. This crisis led many Americans to consider Japanese and other imports, which were generally smaller, and more fuel-efficient. Japanese cars gained a reputation for quality as more Americans bought them. In 1981, lobbying efforts by domestic makers were successful in getting a quota imposed on imported cars. This allowed Japanese manufacturers to raise their prices, and in the late 80s they introduced the larger, more profitable, upscale brands of Acura, Lexus and Infiniti. Later Japanese manufacturers built plants in the U.S. to avoid the quotas as well as fluctuations in currency that affected pricing.

Trucks saved the domestic automakers. In 1970 only 10 percent of registered vehicles were trucks. By 1987 the percentage was up to 30, and by 2001 nearly 50 percent of registered vehicles were classified as trucks. This includes, Sport Utility Vehicles (SUV), pickup trucks, and vans. As American family cars were downsized, buyers shifted to larger and increasingly luxurious trucks. This saved the day for American automakers, as profits on SUVs were much higher than on cars. Even better was the lack of any foreign competition in this market. By the 1990s, however, foreign automakers had competitive products in this market as well. Traffic congestion (and the resulting increase in commuting times) has continued to worsen despite new and expanded highways. These traffic problems also significantly decrease the quality of life.

Cars have become the mainstay of our transportation system. Eighty-nine percent of trips over 100 miles are by auto. Air travel accounts for most of the rest. Trains and buses account for little travel. We reached a significant milestone in 1995 when the number of registered cars equaled the number of licensed drivers. By 2003 the number of registered cars was greater than the number of licensed drivers.

The early promise of cars to provide independence, personal mobility and freedom has largely been fulfilled. What we didn't count on was the cost. Spending on cars follows only spending on housing and food in most household budgets. Our need for oil is driving our foreign policy and threatens to undermine our national security.

These problems have led some to rethink their lifestyle by moving back to city centers to avoid commuting. This has created a rebirth in many downtown areas as new lofts and condominiums are built. As we start the 21st century we are seeing for the first time a reversal of the suburban trend that started the last century. Will we see less dependence on cars in this new century? How will cars fit into tomorrow's society?

Don Patterson is a retired professor of psychology. In his professional life, he did research on visitor studies in museums to identify the factors that make effective exhibits. Cars have been a lifelong interest and his talk on the impact of autos grew out of that interest.

Mobile Homelessness: Cars and the Restructuring of the American Home

by Deborah Clarke

This paper explores the impact the automobile has had on the idealized notion of the American family home. I look briefly at the development of the mobile home and trace the implications that putting the home on wheels has for the free-standing house. I then situate the increasing fragility of the house also in the context of a growing awareness of homelessness in the United States. But the paper deals most fully with the representation of the car as home in contemporary American women's fiction, and how that reflects some of the ways that the car has eclipsed the house as a site of women's space and identity. We will consider Marge Piercy's *Longings of Women*, Danzy Senna's *Caucasia*, Jane Smiley's *1000 Acres*, and Mona Simpson's *Anywhere But Here*. For many of the women portrayed in these texts, the car, rather than the house, functions as home.

Deborah Clarke is associate professor of English & Women's Studies at Penn State University. Her papers at previous conferences have been abstracted in Review *Nos. 34, 36, 39, and 42. Their titles are, respectively, "Driving the Past: Women Writers and the Paradox of Automobility," "Anxiously Popular: Women and the Automobile Culture of the Early 20th Century," "My Mother the Car? Autobodies and Women's Bodies in Contemporary American Women's Literature," and "Race Men and Race Cars." She is a member of SAH.*

Flint & The Buick: Where Fantasy Became FACT-ORY

by Leroy D. Cole

Fig. 1 – The Cornwall Whip Socket factory, one of Flint's largest.

Flint began as a wide spot on the trail between Detroit and the Saginaw Valley. It was known as the Grand Traverse for its easy crossing of the Flint River. Jacob Smith, a prominent Detroit citizen, was the first to move here, and with proceeds from his fur trading established a trading post in 1819. Smith died in 1825. In 1829, John Todd came to Flint and stayed in Smith's deserted cabin. He built a tavern and Flint became a stopping-off place which rapidly grew into a town. By 1832, Flint was a growing village with established schools and churches. In 1855 the city was incorporated.

With its dense forests of pine and oak, Flint's first industry (other than the early fur trading) was timber. One of Flint's early timber magnates was Henry H. Crapo. At its peak, his mill provided 20,000,000 board feet annually. Buggy and wagon manufacturing grew up close to this supply. Crapo's grandson, William C. Durant, got into the buggy business when he ran across a unique cart and bought the tooling, stock, and rights to its manufacture. With J. Dallas Dort, he set out to manufacture the cart in their own factory. Dort ran the factory and Durant was the salesman. In a short time that team became millionaires and Flint became known as "The Vehicle City," producing 120,000 a year. In addition, industries in the city produced 230,000 sets of vehicle wheels, 175,000 vehicle bodies, 300,000 sets of vehicle springs, 200,000 gallons of carriage varnishes, and 1,000,000 whip sockets (Fig. 1). Of its over 15,000 inhabitants, more than 3,000 were employed in the various carriage businesses. The Durant-Dort Carriage Company soon controlled the manufacture of every part that went into their rigs. Durant's plan was to get the suppliers close to the assembly plant and then incorporate them into one business. However, each company retained its management and autonomy.

A local concern was the Flint Wagon Works, and here it was that David D. Buick began to produce his car. But production was foundering when Durant took a ride in a Buick, and by November 1, 1904, he was in control of the company.

The company made only 37 cars in 1904. Durant took two Buicks to the 1905 New York auto show and walked away with 1,108 orders. Buick was on its way with 1,400 built in 1906, 4,641 in 1907, and was number one in sales in 1908 with 8,820 cars built compared with 6,181 for Ford and 2,380 Cadillacs. That year, Durant combined Buick, Olds, Cadillac, and Oakland to form General Motors. The combine by 1910 included other Flint companies as well, the W. F. Stewart Company's Plant 4, Randolph Truck Company, Champion Ignition Company (AC), and Oak Park Power Company.

After Durant's ouster from GM by its bankers, he returned to Flint and bought the Flint Wagon Works building. During 1911, he started the Mason Motor Works, Little Car Company, and Chevrolet Motor Company. Among other motor industry luminaries who worked for GM in Flint were Charles Nash, Walter P. Chrysler, K. T. Keller, and William Knudsen, not to mention graduates of Flint's General Motors Institute (GMI, now Kettering University) such as Ed Cole. In time, Flint became second only to Detroit in the production of automobiles anywhere in the world. As the industry grew, so grew Flint.

Another important person in the history of Buick, and hence of Flint, is Harlow Curtice, who became general manager of the division late in 1933, a year in which Buick sales declined to a bit more than 40,000. In five short years, Buick had reached fourth place in sales, a position it was to hold for years.

But Flint has shared in the general decline of the U.S. auto industry. The Fisher Body Plant No. 1 has closed. Fisher Body Plant No. 2 no longer makes Chevrolet cars, only trucks. Buick Motor Division is mostly gone. Both Chevrolet's pressed metal and six-cylinder engine plants are gone. The Ternstedt plant whose 6,700 employees once produced automotive hardware has been recycled back into farm land. The only common connection between the Buick of 1906 and 2006 is that Buick Valve-in-Head engines are still made in Flint.

Flint is the hometown of Leroy D. Cole who was "born down the road from the Buick factory." Leroy, a past president of SAH, was given the Society's Friend of Automotive History Award in 2005. He is founder of the Cole Car Club of America and presented papers at the Conferences of 2002 and 2004.

Eights – The Engines That Powered the American Dream

by William M. (Bud) Gardner

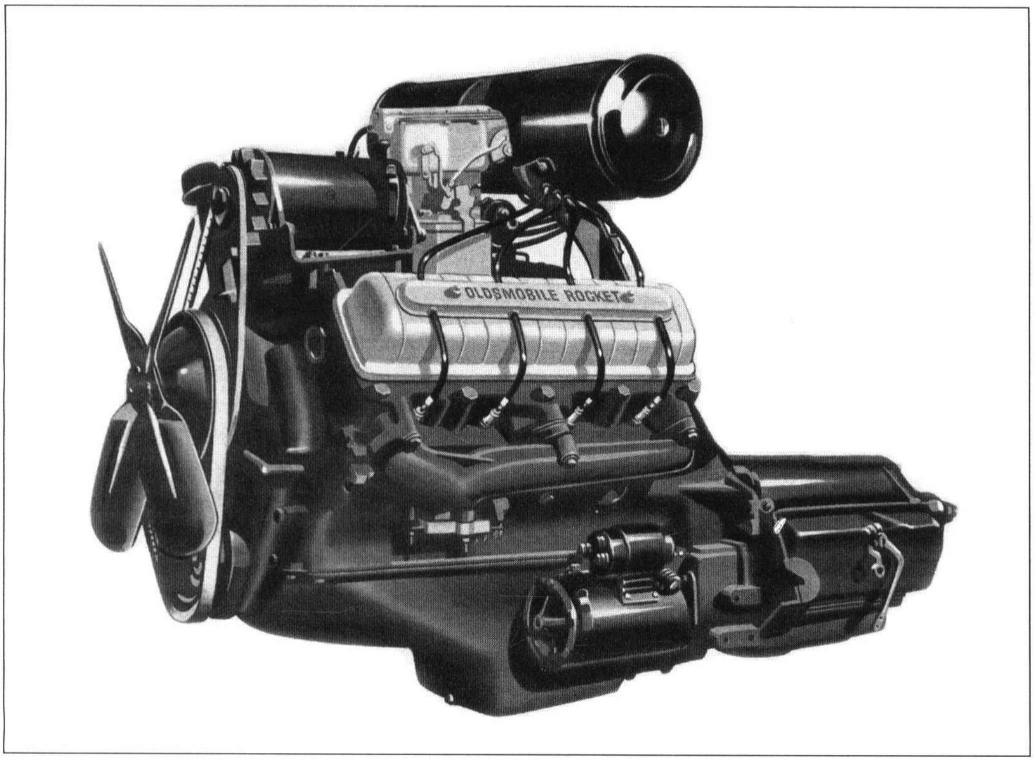


Fig. 1 – The quintessential postwar V-8 engine: 1949 Olds 88 (from the editor's collection).

The 20th century brought many awesome machines: diesel-electric locomotives, jet airplanes, nuclear-powered ships, and even rocket-powered spacecraft. But in influence, none rivaled the automobile. The evolution of 20th century character and culture cannot be separated from the automobile, and the evolution of the automobile cannot be separated from the eight-cylinder engine.

Was it status? Comfort? Utility? Dependability? The postwar Kaiser had it all . . . or did it? What we really wanted was style AND power. We examined new cars from every angle, judging their style—and then we looked under the hood. American buyers wanted well-styled cars that would GO! The Oldsmobile Rocket 88 had it all (Fig. 1).

Styling was a statement of personal taste. We stood back and admired our cars—then we raised the hoods. The power of our cars represented authority, vitality, and zest for life—and eight cylinders shouted "POWER!" Four-cylinder engines were rough and basic; sixes were smoother but more complicated. Twelves and sixteens were far too complex. With the mechanical simplicity of two fours and a smoothness that trumped the six, eight cylinders provided the perfect answer to the demand for ever-increasing power and smoothness.

Large straight-eight engines powered the classic car era and went on to dominate luxury motoring right through the Great Depression. Everyone from factory workers to stars of the silver screen chose straight eights. In 1931, Buick adopted a straight-eights-only policy. Eights appealed to our sense of excitement and influenced the way we thought about the daily rhythm of life. In the straight-eight era, big bands echoed the smooth sound of the straight eight. After World War II, straight-eight demand declined and our taste in music began to change.

Hotrods were the social rage of the '50s and were usually powered by V-8s, especially by modified flathead Ford V-8s. Short-stroke OHV V-8s brought new power and excitement to the hotrod craze. Rock 'n roll and combo jazz pulsated through the '50s and '60s, matching the rumbling rhythm of a V-8 engine with twin glass packs. Automobile racing became a new spectator sport of the 20th century. As early as 1904, true straight eights and V-8s had appeared at the racetrack. Through the '20s and the '30s, straight eights dominated racing, but in the early '50s, V-8s staged a comeback and soon became the engine of choice on both highways and racetracks. By the late '50s, racing straight eights had faded quietly into history.

Bud Gardner, an SAH member from Fairhope, Alabama, is interested in 19th century auto production especially Peugeot, and the history of auto engines, especially eight-cylinder ones. He has compiled a CD with entries for over 300 production eight-cylinder engines covering the period 1902 to 1955.

Bud was asked an interesting question after his talk: when Buick introduced its V-8 in 1953, why did the Special continue to have the straight eight. It seems that production restraints restricted the V-8 to the Super and Roadmaster in its initial year of production, but the '54 Special caught up with its bigger brothers.

The Great Valve-in-Head Mystery

by Terry Dunham

It all started just after the turn of the 20th century, in David Buick's Detroit work shop. A Buick overhead valve (OHV) engine was up and running for the first time, and automotive history would never be quite the same again.
Men working at Buick called their design "valve-in-head" and said that it was better because of it. They were right! The Buick OHV was the single most important mechanical feature in the early success of the Buick car.

In fact, it was one of the most important automotive advances ever. If you totaled up all the engines that were built with configurations other than OHV, that figure would represent only a small fraction of the total OHV engines that have been produced. Simply stated, an OHV engine has its valves located above the piston, at the top of the combustion chamber. The valve stems go through the cylinder head and are opened and closed, normally by rocker arms, which are in turn activated by pushrods and the camshaft. A Buick OHV engine could breathe better and was more efficient. It could thus produce more horsepower per cubic inch of displacement than the more common L-Head, T-Head, and F-Head designs that were then being offered by Buick's competition (Fig. 1).

The importance of the Buick OHV engine cannot be overstated. The very first production cars sold by the company in 1904 used the design, and eventually the entire industry would make use of the principle. With rare exception, all the cars Buick built in the following 100 years also used OHV engines, or as Buick quickly came to advertise it, "Valve-in-Head" engines.

The phrase "Valve-in-Head" is a Buick advertising term and it means the exact same thing as "overhead valve." Walter Marr, Buick's first chief engineer is credited with having originated it, in a history of General Motors published in the 1930s called *The Turning Wheel*. But William C. "Billy" Durant, the man who made the Buick automobile the success it became, and who in 1908 created GM, gets the credit for being the first to heavily advertise and promote the valve-in-head engine. Durant and Buick did such a good job that America soon began to associate a Buick engine as being among the very best available. As a result, Buick automobiles sold well.

Durant had realized early on that Buick could gain a significant competitive advantage if the valve-in-head feature was aggressively advertised and promoted. Before his association with Buick, Durant had been president of a Flint carriage company that manufactured and sold a line with a patented suspension. Durant had focused his advertising of the suspension feature and it had been highly successful. When Durant arrived at Buick, he promoted the valve-in-head in exactly the same manner. It worked at Buick too, and it worked well.

But, even with all this colorful automotive history behind it, how the OHV engine first arrived at Buick is a question for which the answer has remained hidden for more than 100 years and remains unanswered today.

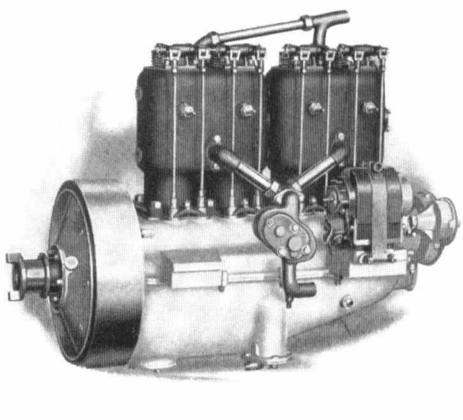
Three very capable engine men were involved with the design and construction of Buick engines at the time OHV arrived at the company. They were David Dunbar Buick, Walter Lorenzo Marr, and Eugene C. Richard. David Buick was a consummate tinkerer and inventor. He became restless in his plumbing supply manufacturing business and, by his own account, in 1893 began to experiment with internal combustion engines. By 1897, he was building and selling L-Head stationary engines. In 1899, he formed the Buick Auto Vim and Power Company in Detroit to further develop his L-Head engines, and, at the same time, he wanted to develop an automobile. It has never been clear just who built the first Buick L-Head engines before Auto Vim arrived in Detroit, but it was probably David Buick and his son Thomas.

The L-Head configuration was considered state-of-the-art in those pioneering days. However, the L-Head design is inefficient by its very nature because it will not breathe well and the first Buick stationary engines were no exception. In 1899, wanting to add a marine engine to his line, Buick hired a Canadian named Murray to do the job. A little later that same year, Buick also hired Walter Marr after seeing him repairing a boat engine at a Detroit dock. Murray was eventually fired when problems arose over how to properly connect the engine to the boat's propeller. Buick then put Marr in charge and Marr not only got things working correctly but he improved the performance of the engine as well.

In the spring of 1901, Marr and Buick had a disagreement and Marr left the company. To replace him, Buick hired Eugene C. Richard. This was a very fortuitous choice. Richard was born in France and he was a talented inventor, draftsman, and machinist. Richard's earlier work included experience with steam engines, some of which had their valves located above the piston.

In February 1902, Richard applied to the U.S. Patent Office to patent an internal combustion engine which utilized the OHV principle. Documents in the patent file indicate that Richard had begun the application as early as November 19, 1901. The patent examiner rejected the application three times. As originally submitted, it included a claim for a water-jacketed valve guide that was found to be in conflict with another patent. The application was amended, and the patent granted on September 27, 1904. On April 4, 1904, knowing that the patent was about to be issued, Richard assigned the rights to David Buick's company, which was now located in Flint.

A fascinating part of the valve-in-head story is the reason why an OHV engine was built at Buick in the first place. Richard's patent application clearly states that "The construction is especially designed with a view to simplicity and ease in manufacture and also the facility to which the parts may be assembled or detached when necessary." Similar wording appears in the first Buick engine catalogues. In other words, the original rationale for the Buick OHV engine was that it would be easier to build, service, and repair. Neither the application nor the catalogue mentions that OHV is a more efficient design, and that it will produce more power than other engines of similar size. In later years, Walter Marr stated in an interview that



CONSTRUCTION

Luxurious comfort, graceful lines, beauty, finish and absolute reliability are Buick features, but above all and beyond all else, our motor gives you ample power. With every purchaser this is the principal feature, as without it the otherwise perfect car is a failure and a disappointment. The Buick motor is famous the world over for its marvelous efficiency, simplicity of construction and mechanical perfection. The Buick valve in the head construction does away with the pockets over the intake and exhaust valves found in the L and T head type, consequently there is not the amount of burned gases remaining in the cylinders after each explosion to mix with the incoming new gas. This feature, coupled with the fact that the power created upon ignition is directly applied to the piston head, owing to the cylinder wall being straight, results in the gain of 20 per cent. more power and greater fuel economy from the same size cylinders.

All Buick motors develop more power for their dimensions than any other ever designed for automobiles. Notice how quick the cleverest salesmen for other cars change the subject when Buick power is mentioned.

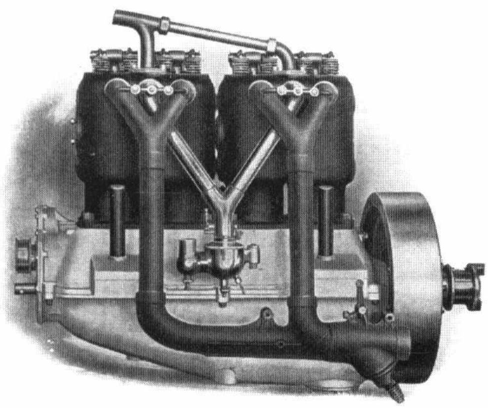


Fig. 1 – The "valve-in-the-head" engine as Buick described it for its 1910 models (from the editor's collection).

OHV's ability to produce more power was "discovered by accident."

At some point, probably in late 1901 or early 1903, a Buick engine catalogue was printed showing three different OHV designs: two vertical stationary engines and a marine version. Over the years, conventional wisdom has held that Richard must have applied what he knew about locating the valves in steam engines to a new internal combustion engine he was working on at Buick, and submitted his patent application.

But there is more to be considered here. Just as Walter Marr was leaving the company in early 1901, he talked with David Buick about purchasing some of the engines they had been working on. As a result, Buick wrote a memo outlining the specific engines and patterns that he was willing to sell to Marr and listing the engines he wanted to keep. Among those were "three of the four cycles" type engines. Not by coincidence, the first Buick engine catalogue published just months later presents three different OHV engines, and identifies two of the three as being "four cycles."

Over the years, Marr often said that the engine he designed for a three-wheeled motor tricycle he had built in 1899 was OHV. That would mean that Marr, like Richard, was also familiar with the OHV design before arriving at Buick. The problem here is that Marr did not patent his engine. The possibility arises that Marr may have started working on OHV before leaving the Buick company in 1901, and that his work was picked up by Richard shortly after Marr's departure.

And what about David Buick? After all, he was the man from whom both Richard and Marr took direction. On May 7, 1906, Durant wrote an enthusiastic letter seeking stock subscriptions for a new motor car company he wanted to form. He reviewed some of the reasons for Buick's strong growth, then went on to praise the Buick engine by saying: "Our motor is the highest powered engine in the work size of cylinders (displacement) considered, and is conceded by all gas engine experts to be one of the greatest improvements in gas engine practice ever designed." Clearly, this reference is to Buick's OHV engine. Durant had this to say about David Buick: "Mr. D. D. Buick is a gas engine expert and is very largely responsible for the creation of the marvelous motor which bears his name." Durant's letter, while surely not the final authority on the subject, represents the oldest contemporary credit for OHV at Buick that can be documented.

I indicated at the beginning of this paper that facts surrounding the early development work on OHV at Buick were complex, complicated, and obscure. Between the two of us, Larry Gustin and I have well over 90 years of experience researching Buick history and the Buick automobile. To this very day, we do not know for a certainty how the OHV engine arrived at the Buick company. Perhaps, someday we will know more.

SAH Member Terry Dunham is well-known as the co-author of the Automobile Quarterly book The Buick—a Complete History, *and the various editions thereof. He worked for General Motors from 1963 to 1992 when he retired. At the 2002 conference he talked about the "1908-1911 Buick: Race Cars from Hell," abstracted in* Review *No. 39. The abstract of his 2004 talk, "Buick's Engineering Advances (1904-1963)" will be found in* Review *No. 42.*

Renault at Montlhéry, 1925: Letters of Ellery I. Garfield

by Patricia Lee Yongue

Fig. 1 – Ellery I. Garfield (supplied by the author).

The racing track of Linas-Montlhéry, or the Paris Auto-drome, was built in 1924, some 24 kilometers from Paris, to accentuate Paris' reputation as a major site of the French auto industry. While Le Mans had inaugurated its famous 24-hour endurance race on the Circuit de Sarthe in 1923, Montlhéry was intended by its motor- and aerosports-addicted financial backer, Alexandre Lamblin, as a closed, banked circuit, like Monza and Brooklands, but principally for speed record breaking contests and for match races, both of which had been extremely popular events in Britain and America from the earliest days of auto manufacture and racing. Montlhéry, in fact, became a premier records track when its famous, and much older, British antecedent, Brooklands (1907), became the target of angry neighboring residents, who successfully maneuvered to "silence" the roaring vehicles through an assortment of restrictions. At Montlhéry there were no restrictions. And there was also a closed road circuit, where some early French Grand Prix were held. Even the lady racers headed for Paris, turning Montlhéry into a central venue for all-women races such as the Coupe des Dames and the Grand Prix Féminin. Now, on the eve of Montlhéry's closure as an official racing track, it seems appropriate to recall a moment in its golden history: the French Renault's taking of the speed record from England's Bentley in 1925.

This presentation develops from a packet of unpublished correspondence, with accompanying photos, between Renault designer, Ellery Irving Garfield (Fig. 1), and Childe Harold Wills, creator of the Wills Sainte Claire automobile (1921-1927). The correspondence occurred during 1925/26, and relates Garfield's detailed history—successes and failures—of his power plant design for the large 6-cylinder Renault chassis that reached 100 mph at Montlhéry that year (Fig. 2). Garfield also drove the car that he had designed specifically to establish the one-hour speed record and also records for clusters of hours, including three, six, and 24 hours. Montlhéry historian William Boddy acknowledges the records events and Garfield, to be sure; yet, there is a character to the letters written by Garfield, and a mystery about the character Garfield himself, that enhance the human interest factor in this piece of Montlhéry history that dovetails with a segment of American auto history. C. Harold Wills we know something about, but Garfield is the unknown. What is also unknown is why Garfield would confide such information to Wills. Where had the two met (at Ford Motor, perhaps, which Wills left in 1919)? Was Garfield interested in returning to America, possibly to work for Wills? Was Wills interested in Garfield as someone who might help the declining Wills Sainte Claire production? Garfield seems to be distressed by American manufacturers' inability to claim records in international speed trials in Europe and to win or even to figure prominently at Le Mans.

Patricia Lee Yongue is associate professor of English at the University of Houston, Texas. She is a former director of SAH. Her article "Elizabeth Junek: Racing the Bugatti," based on a paper she gave at the Fourth Automotive History Conference, appeared in Review No. 39. Abstracts of her papers "Auto-phobia in American Literature: the Challenge for Motorsports" and "Harriet Quimby: Autos Before Aircraft" appeared respectively in Reviews *Nos. 36 and 42.*

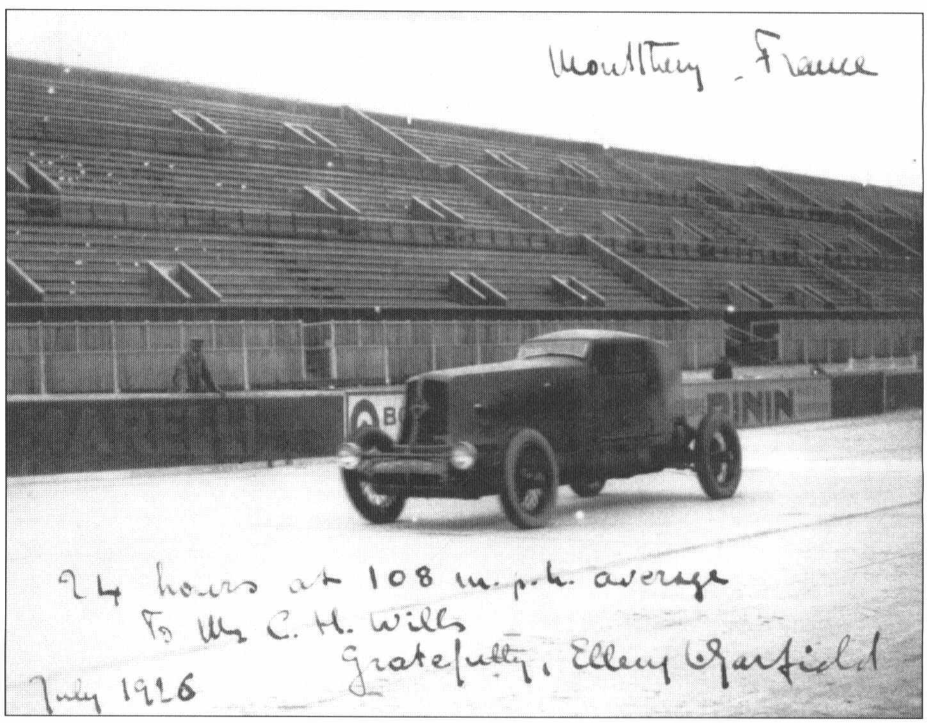


Fig. 2 – Garfield at Montlhéry in the record-breaking Renault (supplied by the author).

From France to France: Automobile Racing Before NASCAR

by Harry Carpenter

Fig. 1 – W. K. Vanderbilt, Jr's "Red Demon" (supplied by the author).

This paper is an in-depth treatment of the development of motor racing, both in the United States and in Europe. Racing in France had begun by 1895. An early notable race was the Gordon Bennett Cup race of June 1900 from Paris to Lyon, a distance of approximately 800 kilometers. Charron won the race at an average speed of 85 kilo-meters per hour. A year later, June 1901, the Paris to Berlin race took place, with 78 entries including one woman, Mme Camille de Gast. Louis Renault won the voiturette class.

In the United States, the first auto race is generally considered to be an event in 1896 in Cranston, Rhode Island. Organized automobile racing emerged in the form of the National Automobile Association (NAA), whose president was William K. Vanderbilt, Jr. The first race took place in 1900 on a one-half mile dirt, horse-racing track near Newport, Rhode Island, and the second, in 1901 at the same location. Vehicles in each category (based on horsepower, maximum weight, or type of power source) raced in separate 5-mile races and all automobiles competed in an open 10-mile run. Vanderbilt and others secured permission to hold races on public roads. In 1902, he donated the Vanderbilt Cup to the newly-created American Automobile Association (AAA) for the winner of the AAA-sponsored Long Island Road Race. In the Midwest, October 1901 saw a series of races sponsored by the Detroit Automobile Club.

Cross-country road racing was also popular in the United States in the first decade of the 20th century. A good example was the New York to Buffalo run of 1901, with 72 entries. Forty-two made it to Rochester where the race was cancelled due to the death of President McKinley. The last major cross-country road race was the New York to Seattle run of 1909.

The Daytona-Ormond Beach area in Florida was discovered to be suitable for record-setting attempts at the measured mile, and Alexander Winton set a new record of 68 mph in 1903 in his famous "Bullet." Later that year, Vanderbilt eclipsed Winton with a run of 90+ mph (Fig. 1). "Speed Week" in the area became a traditional event for automobile speed enthusiasts.

The old horse tracks were succeeded by purpose-built tracks with less severe, banked curves, and shorter straightaways. Dating from 1909, the Indianapolis Motor Speedway is an example.

In 1911, the AAA announced plans to create an automobile circuit across the United States. One purpose of the circuit was to eliminate conflicting race dates. The drivers of race cars organized the Automobile Race Drivers Association, later the Motor Racing Drivers Association of America (MRDAA) to represent the drivers' interests to the AAA Contest Board. A major interest was safety. Too many competitors and inexperienced drivers created dangerous situations for racers, especially at the new, higher speeds. The AAA was concerned that the cars racing should be strictly "stock," and this attitude probably was a significant factor in the gradual decline in the importance of stock-car racing in AAA-sanctioned racing. By 1925, the AAA was the dominant sanctioning body, with the power to suspend drivers for racing in non-sanctioned events. In time, the "Indy 500" as the Memorial Day race at Indianapolis was called, became the dominant AAA-sanctioned race.

In an attempt to keep automobile speed-related events in the Daytona-Ormond Beach area, the city fathers sponsored a road and beach race in March 1936, and obtained AAA sanction for a similar race in 1937. The latter race, 250 miles, was restricted to street-legal and purely stock cars. Of the 27 competitors, among them local driver William ("Big Bill") France, 19 drove Fords. France, a native of Washington, D.C. and an experienced mechanic, had moved to Florida in 1934. With Sig Haugdahl, a retired dirt track racer, he decided to promote races at Daytona Beach, the first one taking place Labor Day weekend 1937. The next year, France and Charles Reese, who owned a car that France had raced at Daytona Beach, promoted two 150-mile races on the road and beach course. This was increased to three races for 1939-41. France competed in races in the Southeast, Midwest, and Pennsylvania.

After World War II, France resumed promoting races on dirt tracks in the Carolinas and Georgia. At this point, there was a confusing variety of sanctioning bodies for stock-car racing, with rules that made equipment legal in one race and illegal in another. Unscrupulous promoters cheated fans and drivers alike. France realized that there was a need for organizing stock-car racing on a national level. Rules needed to be consistent. The definition of stock car needed to be the same for every race. A point system, based on finish order, needed to be developed. At first, France tried to work with the AAA Contest Board but was rebuffed. He decided to create his own organization, what became NASCAR.

Harry Carpenter is an Instructor of History/Social Sciences at Western Piedmont Community College in Morganton, N.C. His chief interest in automobiles is the history of NASCAR as a business and technological organization.

The Effect of Record Breaking and Racing on M.G. Sales in the 1930s

by The Reverend Doctor Richard L. Knudson

Cecil Kimber, the creator of the M.G. sports car, drove his very first M.G. sports car to a gold medal win in the 1925 London—Land's End Trial. With that victory, M.G. went into production and subsequently became the world's leading manufacturer of sports cars.

It was not until 1930 that M.G. began to have notable success not only in racing but also in record breaking. The decade of the 1930s was certainly the most interesting and colorful period in British motoring history. This was also the time of the Great Depression and the amazing growth of M.G. sports car sales during that time depended so much upon the competition successes that M.G. garnered.

The stories surrounding the races, record attempts, car preparation, failures, are all fascinating because they involve interesting people. The personalities involved in all aspects of competition comprise some of the major characters in all of motoring history: Eyston, Campbell, Nuvolari, Lurani, Gardner, Hall, Evans, Denly, Collier, Hamilton, Birkin, Rand, to name a few. Combined with the competition shop at M.G., we must consider the clever marketing side that included all of the advertising and promotion that led to M.G.'s growth. Then there is the design staff that took the lessons learned in competition and applied them to production cars that captured the hearts of customers.

M.G.s from that period were recognized around the world as true sports cars. In America we may never have had the likes of Corvette or Thunderbird in the 1950s if it had not been for the enormous popularity here of the M.G.s in the late 1940s and early 1950s.

This presentation will tie competition success to sales success for what was then the world's most popular and recognizable sports car.

Dick Knudson is the author of M.G., The Sporting Car America Loved First: An Illustrated History of M.G.s in the U.S.A. He lives in Oneona, New York.

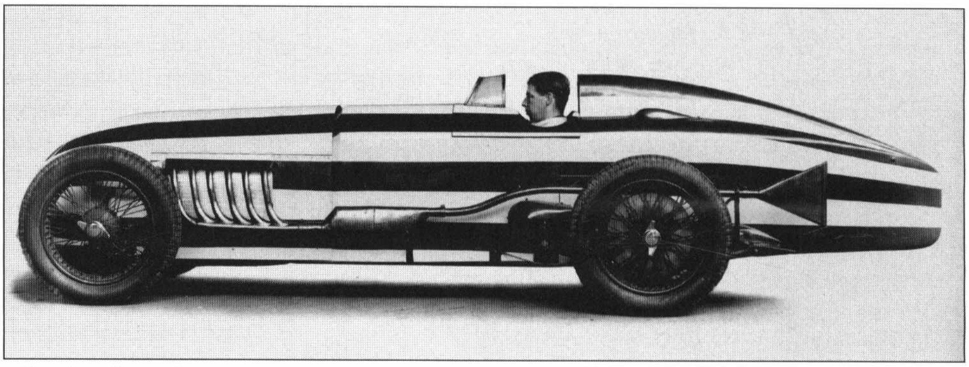


Fig. 1 – Capt. George Eyston in the record-breaking 12 h.p. MG "Magic Magnette" of 1934 (from *The MaGazine,* January 1935, in the editor's collection).

The Automobile and the Massification / Democratization of Sport (Football) in South Africa, 1945-1975

by Cornelius Thomas

Organized sport (mainly the English games of football, rugby and cricket) and the automobile both entered the South African scene at the turn to the 20th century. By 1926, when the U.S. automobile company, General Motors, opened the first assembly plant in South Africa in Port Elizabeth, both had become visible features of the South African landscape. These developments ironically picked up pace during the Depression and, after slowing slightly during the Second World War years, quickened in the post-war period. However, black South Africans (Africans, Coloreds and Indians), did not immediately enjoy the benefit of regular games and leagues. Then entered the automobile!

I discuss how the automobile transformed and indeed massified / democratized South African sports in the years 1945-1975, focusing on the 1950s through the 1970s when the working class increasingly entered the amateur sports scene.

I ask what the relationship between distance and performance was, what constraints militated against the expansion of sport, and what had been done to advance participation beyond the middle and lower middle class. My ultimate question is what role the automobile played in transcending the class divide between middling and working classes. I further probe what the social and political impact was in serving and using sport in apartheid South Africa.

Most of my insight is derived from oral history interviews, but I also draw on Peter Alegi Azuma's: *Soccer, Politics and Society in South Africa* (2004), Imtiaz Cajee's *Timol—A Quest for Justice* (2005), and the various works of historians Christopher Merrett, Andre Odendaal and Rudzani Mudau.

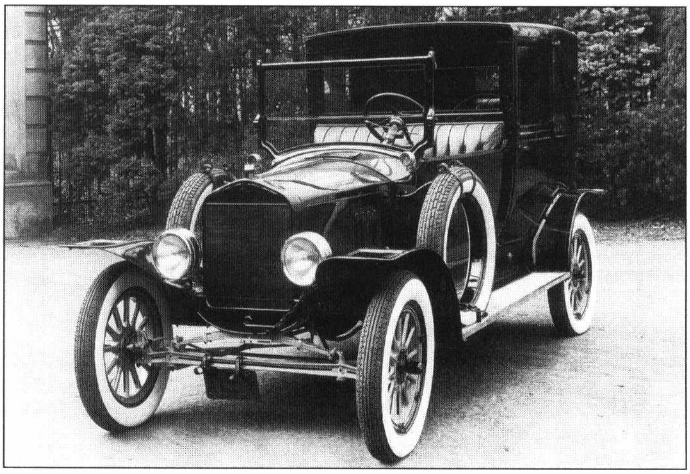
Cornelius Thomas is Director of the Liberation Archives of South Africa and a professor at the University of Fort Hare. He is an alumnus of Notre Dame and has taught history and anthropology there and at Clarion University of Pennsylvania, and in South Africa, at Rhodes University and the University of Natal.

A Review of The Derham Body Company Operations - 1917 to 1954

by Dale K. Wells

My paper includes copies of examples of Derham internal records, correspondence with customers describing marketing situations, and photos of various proposed or completed custom coachwork automobiles. I will explain: (1) the unique origin and history of the custom coachwork era, and sources of more detailed information; (2) observations about the business and social environment of the era as reflected by the Derham records; (3) Derham operating procedures relative to (a) marketing, (b) manufacturing, and (c) customer service; (4) the growth, volume, and decline of Derham's business, and significance thereof; and (5), an appendix of Derham records supporting the observations above.

Dale Wells is a past president of SAH, the Classic Car Club of America Museum, and the Stutz Club. He has an MBA from Michigan State University, and contributed to the Cugnot award-winning book, The Splendid Stutz. *He is currently Vice-President for Programs, The Classic Car Club of America Museum, and research associate for the CCCAM Noel Thompson Library which contains the remaining archives of the Derham Body Company, plus some records and memorabilia of Raymond Dietrich, Gordon Buehrig, and the Judkins Body Company.*



Ford Model T Town Car with body by Derham (courtesy of the Classic Car Club of America).

Canadians, Americans and the Early Automobile Industry

by Douglas Leighton

In the earliest years of the automobile, Canadian inventors and tinkerers produced individual machines much like those of their American counterparts. The creation of companies to produce automobiles, however, demonstrated differences between the two countries. Almost from the beginning, Canadian firms looked to sources in the United States for their engines, leading to a dependent relationship and eventually the absorption or extinction of domestic Canadian producers. Why did Canada not produce complete cars on its own? Were the industrial cultures and capacities of the two countries different? I will attempt an assessment of these questions and try to explain the roots of Canadian automotive development.

Among the Americans who came to Canada were William C. Durant, to welcome McLaughlin-Buick to the GM family (Fig. 1), and his former partner in the Dort-Durant Carriage Company in Flint, J. Dallas Dort. By now, Dort was making a car bearing his own name. He gave a license to the Gray Carriage Company to produce the car, known in Canada as the Gray-Dort. The greatest number of Henry Ford's ubiquitous Model T ever sold in Canada was in 1926, its final full year of production. The general presumption of the era was that Canadian cars had a better finish than their U.S. counterparts. Studebaker established a plant in Hamilton, Ontario, after World War II, and moved automotive production there from South Bend shortly before it discontinued the manufacture of automobiles. Differences between Canada and the United States included market size, distances, and weather. Markets were smaller, distances were greater, and weather was tougher.

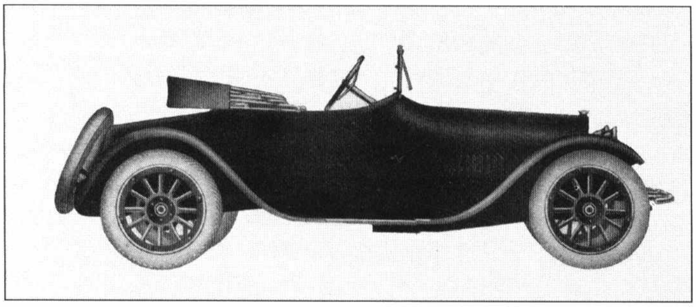


Fig. 1 – 1916 McLaughlin Model D-54 with 6-cylinder "Valve-in-Head McLaughlin-Buick Motor" (from the editor's collection).

Douglas Leighton, a newly-elected Director of SAH, is associate professor of history at Huron University College, London, Ontario, Canada. Readers will recall Dr. Leighton's contributions to previous conferences: "Dreaming of What Might Have Been: William Stansell, London Motors, and the London Six" (published in Review No. 36). and "Early Automobile Manufacturing in London, Ontario," "Mr. Ford Comes to London, Ontario, 1916," and "Displaying the Automobile: Early Auto Shows in London, Ontario," abstracted respectively in Reviews Nos. 32, 39, and 42.

In the Q & A period afterwards, Dr. Leighton was asked why the United Kingdom never penetrated the Canadian market. His answer was that they did make an effort in the early postwar years but that they were unsuited for Canadian conditions. Both build quality and service were poor.

The Automotive Psychology of Alfred Hitchcock's *Vertigo*: Motivational Research and the Expressionistic Automobile

by Dave Duricy

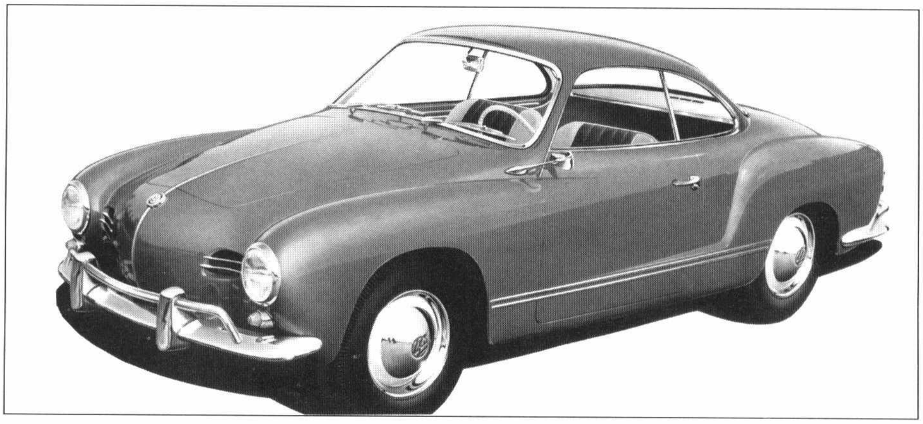


Fig. 1 – A Karmann-Ghia (1956) like the one Midge drives (from the editor's collection).

About Vertigo

Alfred Hitchcock's 1958 film *Vertigo* is one of the most admired and analyzed films in the history of U.S. cinema. The American Film Institute voted *Vertigo* to be among the best 100 films of the last century. Scholars search the cinematography, colors, and costumes of *Vertigo* for meaning, and find everything from dream analysis to Hitchcock's psyche.

Critics have overlooked the strongest presence in *Vertigo*, and that is the automobile. The automobiles are filmed with the same importance as the actors and locations. Paying attention to the makes, colors, and body styles of these cars reveals insights into personalities of the main characters, and suggests a criticism being made by Hitchcock regarding U.S. car culture and advertising.

About Motivational Research

Advertising of the early postwar years was inspired by a new technique called Motivational Research. MR applied psychological testing to consumer surveys to reveal the unspoken impulses that cause a customer to buy one product rather than another. MR was applied to the problems of selling prunes, guilt-ridden ready-mix cakes, and automobiles. MR was championed in the '40s and '50s by Ernest Dichter, then denounced by Vance Packard in 1957, the year that *Vertigo* was filmed, with his book *The Hidden Persuaders*.

Vance warned of a psychologically-controlled population made to buy and sell products as well as each other at the whim of an insightful elite. Hitchcock provides clues in the form of embedded commercials that *Vertigo* is a depiction of a world shaped and permeated by MR consumerism. Scenes mirror popular advertising, such as the Body by Fisher girl of 1930, and contemporary Karmann-Ghia and Dodge sales materials. The characters Midge and Elster speak in the language of print ads, and Midge is employed as a commercial illustrator. John Ferguson, flawed hero and DeSoto owner, dresses in the manner of a DeSoto advertisement, wearing his hat at the wheel while others around him are dressed casually.

Automotive Identities

MR characterized automobile owners by make and an associated personality type such as "Middle of the Road Moderates" who preferred the newest of the not-too-new such as light colored two-door hardtops with modest fins. The "Sophisticated Flair" type of person was reported to prefer Studebakers and foreign cars. Hitchcock uses the association of personality types with certain car brands to express aspects of his characters' personalities. Ferguson drives a DeSoto. Midge drives a Volkswagen Karmann-Ghia. (Fig. 1) Madeleine drives a Jaguar. All these cars speak regarding their respective owners in ways the actors and script cannot.

Conclusion

Motivational Research quantified the automobile as a meaningful object. Respecting cars as such in *Vertigo* brings a new interpretation to the film, and a potential for greater insight into other artworks and scenarios in which automobiles appear.

Dave Duricy is webmaster for the Society of Automotive Historians, and founder of DeSotoland.com.

From Conceptualization to Public Showing: Brawn to Beauty, History of the American Pickup Exhibit at the Alfred P. Sloan Museum

by Tom Brownell

This paper will describe the steps in preparing "Brawn to Beauty," the Alfred P. Sloan Museum's contribution to automotive history and Pierson Gallery exhibit for 2004-2005.

Based on actual experience, I trace the steps beginning with an automotive museum's dilemma—what facet of automotive history to use as the focus of an exhibit to replace a highly popular, currently touring, one—to planning the exhibit, researching the history and writing the script, obtaining visuals for scenic backdrops, locating the vehicles, preparing for public showing, and selecting a suitable launch date.

In 2003, the Alfred P. Sloan Museum in Flint, Michigan, had shown a highly popular Buick Centennial exhibit in its Pierson Gallery. Well-timed and enthusiastically received, this exhibit toured with other museums. Now the Sloan staff faced the dilemma—what would be a suitable historical focus to replace the Buick Centennial? With 2004 not a centennial year for any surviving brands, the decision was made to shift focus entirely and display the history of America's current favorite vehicle, the light duty truck, and attempt to answer the question: how has this formerly stark working vehicle become the transportation choice for a majority of Americans?

Starting with this question, the museum staff then sought a resource person to research pickup history, attempt a well-reasoned and researched answer to the question as to pickup popularity and its transition away from solely utilitarian uses, write the script the exhibit would portray, assist in selecting and locating representative vehicles as well as helping procure visuals and other media that would be used to provide a suitable backdrop for the exhibit. The title "Brawn to Beauty" was chosen to express the pickup's transition and anchor the display. As a pickup historian I was invited to research and write the script and through my contacts in the pickup world to assist with locating trucks and associated media. The museum staff asked that research on the pickup's transition study the changing role of women as pickup truck owners and primary drivers.

Several milestones presented themselves as key points in the pickup's history that the exhibit would attempt to address: first, the evolution of pickups from cars (sometimes home-built); second, the development of pickups as strictly functional vehicles with styling shared with manufacturers' "big" trucks; third, at intervals, a reversion to the pickup's car origins (notably Coupes Express in the 1930s and the Ranchero, El Camino car/pickup hybrids in the 1950s); fourth, the introduction of integrated styling with the 1955 Chevrolet Cameo (Fig. 1); fifth, a dramatic rise in pickup popularity coinciding with the "camper craze," and finally, pickups as the best-selling American vehicles. Research looked for sociological factors in these milestones and strongly suggested a literary impetus, John Steinbeck's best selling novel *Travels with Charlie* as a major inspiration for the camper craze and the sharp spike in pickup sales during the 1960s.

Fig. 1 – The 1955 Chevrolet Cameo pickup truck (from the editor's collection).

Locating owners willing to display, for a period anticipated to be one year, vehicles that represented each of the milestones proved a major undertaking. How these vehicles were located is part of the story. Besides vehicles, original ads and photos were needed to produce suitable backdrops, the museum store needed stocking to reflect the pickup focus, other media were needed to enliven the display, and, following Sloan's educational emphasis, models and working toys were needed for children.

Mounting an automotive history exhibit is a multi-faceted task, ending with, hopefully, a successful launch to the public.

Thomas H. Brownell, a long-time SAH member, was professor, automotive and heavy equipment management program, Ferris State University, Big Rapids, Michigan. He has written the "Questions and Answers" column for Old Cars Weekly *for over 20 years. Tom is the author of* How to Restore Your Collector Car *and was editor-at-large of* This Old Truck *magazine. His presentations at previous conferences were abstracted in* Review *No. 32 ("The Arsenal of Democracy: America's Auto Industry at War"),* Review *No. 34 ("The Automobile: Dominant Symbol of the 20th Century"), and* Review *No. 42 ("John Jerome's Death of the Automobile Revisited").*

Book Review

Elwood Haynes – Hoosier State Auto Pioneer

by Taylor Vinson

***Haynes-Apperson and America's First Practical Automobile**, W. C. Madden, McFarland & Company, Inc., hard cover, 227 pp., ISBN 0-7864-1397-2 (2003), soft cover, 237 pp., ISBN 0-7864-2675-6 (2006). Hard cover available from Automotive Heritage Museum, 1500 N. Reed Road, Kokomo, IN 46901; soft cover available from the publisher, Box 611, Jefferson, NC 28640, $35.*

***Alloys and Automobiles**, Ralph D. Gray, Indiana Historical Society, 243 pp., (1979), reissued by Guild Press Publishing (2002), 243 pp., available from Automotive Heritage Museum, 1500 N. Reed Road, Kokomo, IN 46901, $24.95.*

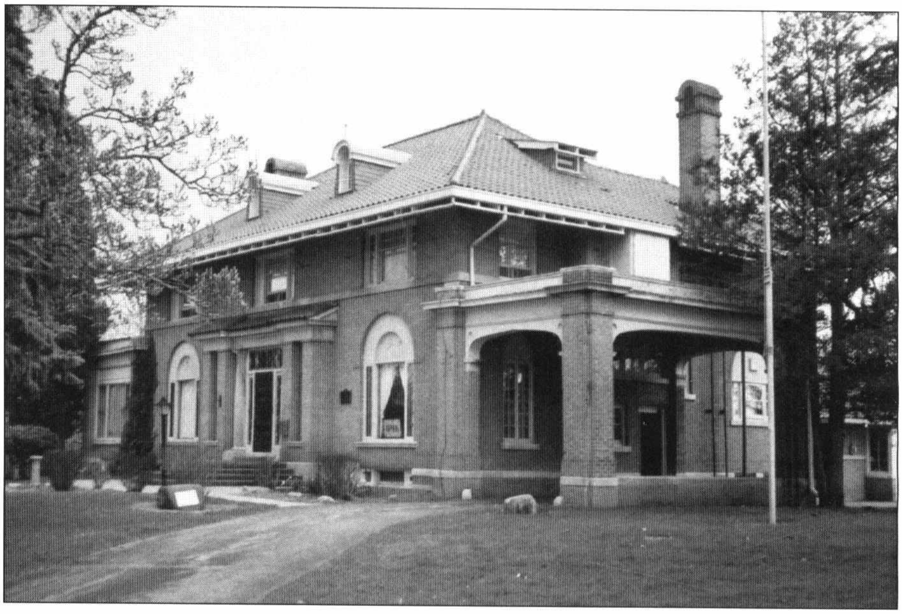


Fig. 1 – The Haynes Museum, formerly the home of Elwood Haynes where he died in 1925 (photograph by the editor).

Background

The Indiana auto pioneer Elwood Haynes may be a name little remembered by the world at large, but the Society of Automotive Historians showed its respect by placing him on the cover of Issue No. 1 of the *Automotive History Review* (Winter 1973-1974; see also inside front cover of Index Issue, Summer 2005). The recent Automotive History Conference in South Bend, Indiana, provided an opportunity for several of us to make a pilgrimage of sorts to Kokomo where we visited his old home, now the Haynes Museum (Fig. 1).

It has always been a puzzle to me how Haynes could claim to be the manufacturer of "America's first car" as he did for many years. This review attempts to answer that question in light of the two books listed above and factory promotional materials as well as reference to two further works, Richard P. Scharchburg's *Carriages Without Horses*, and *The Standard Catalog of American Cars 1805-1942* by Beverly Rae Kimes and Henry Austin Clark, Jr.

Of the two books under review, *Alloys and Automobiles* by Ralph D. Gray encompasses in depth the whole life of the man, while *Haynes-Apperson and America's First Practical Automobile* by W. C. Madden focuses more on the manufacturing history of the companies that produced Haynes-Apperson, Haynes, and Apperson motorcars. Madden's book also contains informative sections on the Haynes and Kokomo's Automotive Heritage Museums and an Appendix listing the known employees at Apperson and Haynes plants. In short, the books complement each other.

Elwood Haynes (1857-1925) led a remarkable life. A native Hoosier, he was a well-educated man unlike many of the auto industry's pioneers. Chemical experiments had occupied him since childhood, and he matriculated in 1881 at what is today the Worcester Polytechnic Institute in Massachusetts. He came home to Indiana to teach school for three years, returning east to Johns Hopkins University in Baltimore, Maryland, to pursue a graduate degree in chemistry. His studies in investigating the atomic weight of aluminum ended abruptly with the death of his mother, and he returned home after less than a year to resume his career as a teacher. After natural gas was discovered in Indiana, Wood, as his family called him, set about learning all he could about the business and in time became manager of a public utility. He invented a thermostat, and a meter to measure the flow of gas in various-sized pipes and at variable pressures. The gas business eventually took him to Kokomo where he conceived the idea of a mechanical replacement for the horse.

Haynes and the Apperson Brothers

Haynes' interest in self-propelled machines was stirred by his visit to the Chicago World's Fair of 1893. Buying a one-cylinder Sintz marine engine, he experimented with it in his kitchen in Kokomo, then took it to the nearby Riverside Machine Shop run by Elmer and Edgar Apperson , and asked the brothers if they could mount it to a buggy in accordance with his design drawings. Gray indicates that this was November 1893. Haynes designed the frame on which the buggy sat and chains that ran from the rear axle to a shaft forward of the motor. Elmer Apperson devised clutches and gears for each chain. Haynes determined the amount of traction required to overcome road resistance. Edgar created the wheels. In sum, Haynes conceived the vehicle and worked out the engineering problems "using the higher mathematics he had acquired so laboriously at Worcester" (Gray) and financed the project. The Appersons built the car, making modifications and suggestions in the process. This sums up the respective contributions of Haynes and the Appersons to their first car, known as the "Pioneer."

After the Appersons completed the car, Haynes took it out for its first trial run on July 4, 1894. The site was the picturesquely named Pumpkinvine Pike (Fig. 2). He did not intend to produce it. Haynes and the Appersons then collaborated on a second car which was entered with the Pioneer in the 1895 *Chicago Times-Herald* Thanksgiving Day race. Though the car failed to run in the race, it excited such interest that the three men formed the Haynes-Apperson Automobile Company in 1896 but did not incorporate it until May 1898. Madden states that 17 vehicles had been produced up to that time; Gray says that only 9 were produced in 1896-98. According to Madden, within the Haynes-Apperson Company, the Appersons fabricated the cars while Haynes took care of promotional literature and advertising until 1903 (while continuing to work for the gas company). The Appersons started their own company in 1902, Apperson Brothers, and began to manufacture Apperson cars. Meanwhile, the Haynes-Apperson marque continued under Elwood until 1905 when the Apperson name was dropped. The last Haynes car appeared in 1925 and the last Apperson in 1926. Madden cites estimated production figures for Haynes-Apperson and sales figures for Haynes motor cars but neither for Apperson. This is a curious omission, as yearly production figures for Apperson can be found in the *Standard Catalog of American Cars 1805-1942* (3d ed.). According to this source, there was a lifetime total of 17,087 Apperson cars. Madden estimates that 1,364 Haynes-Appersons were manufactured, and that 27,900 Haynes were sold through 1918 (the table head reads "1906-24" but figures past 1919 are inexplicably not provided). It would seem that Haynes was the more popular product. However, no Haynes car is as well remembered as the "Jack Rabbit" which Apperson made for a number of years.

Fig. 2. – The marker near the center approximates the location where Elwood Haynes first drove the Pioneer on July 4, 1894, on what was then Pumpkinvine Pike, today near the intersection of a busy six-lane highway (photograph by the editor).

Elwood Haynes's true love, however, was metallurgical research, and he was proud to claim the first use of aluminum in auto engines (1895) and the use of nickel steel in automobiles (1896). The need for alloy steels in automobiles gave him an excuse to return to the laboratory where he discovered alloys that he patented under the name "Stellite." On our visit to Kokomo we passed a company called Haynes International, which started in 1912 as the Haynes Stellite Company and still manufactures alloys. Haynes and Englishman Harry Brearley both thought they had invented stainless steel, though Brearley's patents slightly predated those of Haynes. The American Stainless Steel Corporation was formed in 1917, and Haynes and Brearley shared equally in its royalties. Gray's book treats Haynes' career in gas and metallurgy in the greatest detail. In truth, Haynes' contributions to metallurgy outshine those to the automobile industry.

What did Haynes claim and when did he claim it?

In 1913, Haynes began to proclaim that he personally was the inventor of America's first car. Before then, such claims were qualified and corporate in nature. Haynes-Apperson's initial claim was that the 1894 vehicle was "probably the first complete gasoline carriage built in the United States" (sales catalog, 1899-1900, when Elwood Haynes was responsible for promotional materials). Next, a 1901 Haynes-Apperson ad identifies the company as "The Oldest Maker of Motor Cars in America." This was true in 1901; Haynes-Apperson had been making cars longer than any other manufacturer in the United States still producing automobiles.

The exaggerations begin in 1905. The Haynes catalog stated that year that "Mr. Elwood Haynes began the manufacture of automobiles in 1893. These were the first gasoline machines made in America." The fabrication of the "Pioneer" did begin at the Appersons' shop in 1893 but was not completed until 1894. Series production did not begin until

1896. But ever after, both Haynes and the Appersons stretched the point and cited 1893 as the date that they each began the manufacture of automobiles.

By 1913, Elwood proclaimed himself "Inventor and Builder of America's First Automobile in *The Complete Motorist*, a company publication. Ostensibly written by Haynes, he tells of the 1894 run in "America's First Car" and that phrase was used in Haynes ads for years afterwards. Throughout 1918, the company advertised that it was observing its "25th successful year" as "Elwood Haynes built America's first car in 1893." Elwood Haynes the author resurfaced in "How I Built the First Automobile" (*Haynes Pioneer*, July 1918).

What emboldened Haynes by 1913 to assert the unqualified claim that the Haynes was "America's first car"? I suggest that the primary reason is that the question was not in dispute between 1902 and 1911, the pendency of the Selden patent case. The patent, granted in 1895 but filed in 1879 was for an automobile. Selden sued Alexander Winton for patent infringement and won. This led to the formation of the Association of Licensed Automobile Manufacturers (ALAM). If an auto manufacturer did not become a member of ALAM and pay royalties on its products, it faced legal action. ALAM sued non-member Ford Motor Company and won. But Ford appealed and the judgment in favor of ALAM was overturned in 1911.

Although Haynes considered the patent invalid, Haynes-Apperson joined ALAM in 1903, as did Apperson Brothers. As the gist of the suit was that Selden had invented the automobile, ALAM member Haynes could not claim the honor of having done so while the patent was still legally valid. After the patent was overturned, the question of who invented the automobile was re-opened. In the immediate aftermath of the ruling, Haynes wrote a letter later in 1911 still modest in claims about the Pioneer: "I do not know whether it was the first machine of this character manufactured in America or not. On the other hand, I do not know of an earlier operative machine of this sort. I believe, however, that it was the first *complete, practical* gasoline machine built in America." In this remark, he echoes Henry Ford who advertised during the litigation that the Selden patent did not cover a "practicable vehicle." Gray surmises that Haynes justified his 1911 letter on the grounds that the Duryeas were merely motorized buggies whereas his own vehicle though buggy-like was purpose-built as a self-propelled vehicle.

After the decision in the Selden patent case, the claims on behalf of Duryea came into sharper focus. Its claim to primacy is that the car's initial run occurred on September 21, 1893. The Duryea Motor Wagon Company was established in 1895, and began production in 1896. After producing only 13 vehicles (Madden), in 1898, the Duryea Motor Wagon Company ceased production, and licensed the National Motor Carriage Company to produce the Duryea car. National showed an 1899 model but after that, production of a Duryea car ceased. Before 1913, Haynes had only argued that he had produced "the first *complete, practical* gasoline machine built in America." Thus the title of Madden's book, *Haynes-Apperson and America's First Practical Automobile*. Given that a Duryea won the *Chicago Times-Herald* Thanksgiving Day Race in 1895 whereas the two Haynes vehicles present never even started, it is indeed curious that Haynes concluded that his was the first "practical machine."

Haynes and Charles Duryea exchanged at least one letter on the subject. On July 2, 1915, Haynes wrote to Duryea "When I set about making my first car I did not know that anything was being done by any one at any place along this line, and whatever blunders or mistakes I made were due to my own shortcomings, as I did not copy the machine from any one else."

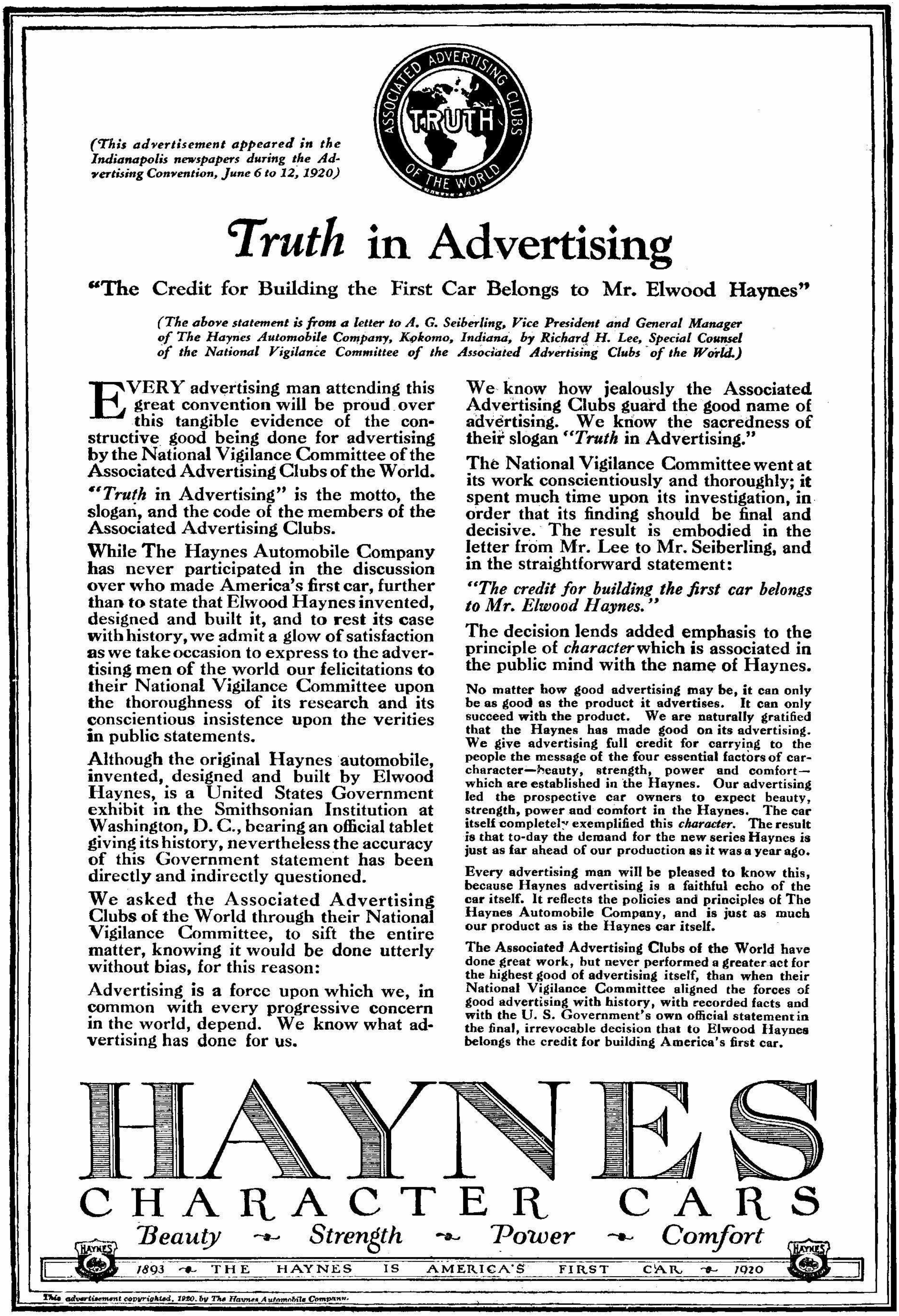
This is probably true. In his paper "The Evolution of the American Automobile," presented at the first Automotive History Conference in 1996, Scharchburg noted that

> In the 1890s, men whose names would become legend in automotive history, such at the Brothers Duryea, Stanley and Studebaker, Percy Maxim, Alexander Winton, Albert Pope, Edgar Apperson, Elwood Haynes, Henry Ford, Ransom Olds, Henry Knox, and Charles Brady King were working in relative obscurity unaware that so many others were struggling with the same problems in either developing suitable engines or motor vehicle.
>
> — (*Automotive History Review* No. 32, p. 48, at 49)

As Scharchburg concluded, no one person can be called the inventor of the American automobile. He showed that there were demonstrations of several gasoline-powered self-propelled vehicles before 1890. Scott Bailey discussed in detail one of these, John Lambert's 1891 three-wheeled gasoline-powered buggy in *Antique Automobile* (Vol. 24 No. 5, 1960). None of the earliest vehicles entered production.

Although the 1913-18 claims clearly demonstrate that Haynes was now contesting the primacy of the Duryea vehicle, there is an alternative view. Bailey in the article mentioned earlier was the first to relate the story (followed by *The Standard Catalog* and Madden) that Haynes, having heard of the Lambert machine, obtained a promise from its inventor that he would not contest Haynes' identifying his own car as America's first. Gray downgrades it from fact to "a rumor that once circulated in the state" and dismisses the story as without attribution, and "too preposterous to be credited." Further, Bailey seems to undercut his thesis. According to him, Lambert moved his business to Indiana in 1894 and "it was prior to this move to Indiana that Elwood Haynes sought out and obtained the promise that John Lambert would permit him to make the claim that the Haynes could be promoted as American's first automobile." But Haynes never flatly promoted his car as "America's first automobile" until 1913, two decades after Lambert's supposed promise. Further, the Lambert machine was a three-wheeler, and as such not likely to have been considered a "car" by Haynes, even less so than the Duryea motorized buggy. Reflecting the historical confusion of the early 20th century, Madden, as part of a fine discussion in his Introduction, relates that in 1920, the National Vigilance Committee of the Associated Advertising Clubs of the World credited Haynes for building the first American car. Haynes took out an ad publicizing that conclusion (Fig. 3). Whatever that organization and its "Vigilance Committee" may have been, the basis on which it made its decision is lost to time.

Charles Duryea marshaled his resources during the early '20s and Scharchburg notes that by 1926, the year after Haynes died, the "which came first issue had been pretty much settled in



(*This advertisement appeared in the Indianapolis newspapers during the Advertising Convention, June 6 to 12, 1920*)

ASSOCIATED ADVERTISING CLUBS OF THE WORLD — TRUTH

Truth in Advertising

"The Credit for Building the First Car Belongs to Mr. Elwood Haynes"

(*The above statement is from a letter to A. G. Seiberling, Vice President and General Manager of The Haynes Automobile Company, Kokomo, Indiana, by Richard H. Lee, Special Counsel of the National Vigilance Committee of the Associated Advertising Clubs of the World.*)

EVERY advertising man attending this great convention will be proud over this tangible evidence of the constructive good being done for advertising by the National Vigilance Committee of the Associated Advertising Clubs of the World.

"*Truth* in Advertising" is the motto, the slogan, and the code of the members of the Associated Advertising Clubs.

While The Haynes Automobile Company has never participated in the discussion over who made America's first car, further than to state that Elwood Haynes invented, designed and built it, and to rest its case with history, we admit a glow of satisfaction as we take occasion to express to the advertising men of the world our felicitations to their National Vigilance Committee upon the thoroughness of its research and its conscientious insistence upon the verities in public statements.

Although the original Haynes automobile, invented, designed and built by Elwood Haynes, is a United States Government exhibit in the Smithsonian Institution at Washington, D. C., bearing an official tablet giving its history, nevertheless the accuracy of this Government statement has been directly and indirectly questioned.

We asked the Associated Advertising Clubs of the World through their National Vigilance Committee, to sift the entire matter, knowing it would be done utterly without bias, for this reason:

Advertising is a force upon which we, in common with every progressive concern in the world, depend. We know what advertising has done for us.

We know how jealously the Associated Advertising Clubs guard the good name of advertising. We know the sacredness of their slogan "*Truth* in Advertising."

The National Vigilance Committee went at its work conscientiously and thoroughly; it spent much time upon its investigation, in order that its finding should be final and decisive. The result is embodied in the letter from Mr. Lee to Mr. Seiberling, and in the straightforward statement:

"The credit for building the first car belongs to Mr. Elwood Haynes."

The decision lends added emphasis to the principle of *character* which is associated in the public mind with the name of Haynes.

No matter how good advertising may be, it can only be as good as the product it advertises. It can only succeed with the product. We are naturally gratified that the Haynes has made good on its advertising. We give advertising full credit for carrying to the people the message of the four essential factors of car-character—beauty, strength, power and comfort—which are established in the Haynes. Our advertising led the prospective car owners to expect beauty, strength, power and comfort in the Haynes. The car itself completely exemplified this *character*. The result is that to-day the demand for the new series Haynes is just as far ahead of our production as it was a year ago.

Every advertising man will be pleased to know this, because Haynes advertising is a faithful echo of the car itself. It reflects the policies and principles of The Haynes Automobile Company, and is just as much our product as is the Haynes car itself.

The Associated Advertising Clubs of the World have done great work, but never performed a greater act for the highest good of advertising itself, than when their National Vigilance Committee aligned the forces of good advertising with history, with recorded facts and with the U. S. Government's own official statement in the final, irrevocable decision that to Elwood Haynes belongs the credit for building America's first car.

HAYNES

CHARACTER CARS

Beauty — *Strength* — *Power* — *Comfort*

1893 — THE HAYNES IS AMERICA'S FIRST CAR — 1920

Fig. 3 "Truth in Advertising" a 1920 Haynes ad which the company felt vindicated its claim to building the first car (from the editor's collection).

favor of the Duryea vehicle" (p. 213) substantiating my view that the question was in truth unresolved during the years that Haynes was making his claims.

More modest claims by Apperson Brothers

Not to be overlooked are the similar claims of the Apperson Brothers. The Appersons, after all, had contributed to the design of the 1894 Haynes vehicle and had fabricated it, as well as building all Haynes-Apperson cars from 1896 until going out on their own in 1902. Goaded by statements in Haynes literature, they undoubtedly felt justified in making similar claims such as adopting 1893 as the date of first manufacture. In their 1909 catalogue, the Appersons claimed that "we are now beginning our sixteenth year in the manufacture of motor cars." The 1910 Apperson catalog trumpeted "It is generally conceded and well known among the automobile public that Apperson Brothers are the oldest regular manufacturers of automobiles in the United States; in the early Nineties we made the first gasoline automobile built in the United States. . . ." The next year, 1911, they repeated the claim, and added a dig at their former business associate:

> The first American automobile built from the drawings and by the hands of Elmer Apperson with the assistance of his brother, Edgar, down in Kokomo, Indiana, in 1893, now occupies a niche in the Hall of Fame in the Smithsonian Institute in Washington, D.C. It is under the name of a man who backed the Apperson brothers with his capital in their initial manufacturing venture, but Father Time will see to it that the proper credit is due to the men to whom credit is due."

By 1914, the Brothers, not waiting for Father Time, took full credit, omitting even a veiled reference to Haynes: "In 1893, Elmer Apperson made the first crude working drawings of a 'Horseless Carriage.' A little later, assisted by his brother Edgar, he built from these drawing the first American automobile." This was the highpoint of Apperson misrepresentation. By 1917, they claimed only to have produced "the first successful American gasoline automobile" and in 1918, arguably more accurately, as manufacturers of "the first practical, commercially successful American automobile." By 1920, the Brothers were depicted in sales literature as simply "Those Pioneer Motor Car Builders of Kokomo." In sum, though the Brothers' claims were similar to those of Haynes, they were not so flamboyantly announced.

Haynes generally ignored the digs by Apperson but got in one of his own. The cover of the March 1916 *Haynes Pioneer* shows a leering driver of a Haynes car bearing down on a pair of jack rabbits running for their lives. (Fig. 4)

Other factors

Given what appears to have been a historical fog until the 1920s, the assertions of Haynes and the Appersons appear in a more benign light. One must also consider other possible influences of the era. The three men were born in the age where the frontier tradition of tall tales was still fresh, and they grew up surrounded by a snake-oil ethos of advertising where the benefits of a product could be exaggerated without proof of their efficacy.

Finally, Haynes' non-automotive business career is revealing in providing a possible additional explanation of his tenacity in pursuing his "first car" claim. When his patent applications for two alloys were initially rejected on the grounds that an application filed a year earlier anticipated his, Haynes fought and overcame the rejection by showing that he had produced his alloys before the earlier application had been filed. Later, seventeen days after he filed a patent application for stainless steel, an Englishman filed a similar application which was granted while the Haynes application was still pending. Haynes applied for an Interference, which was granted. Eventually, the men compromised and pooled their interests in the American Stainless Steel Company. As Gray notes, "Both Elwood Haynes and Harry Brearley *sincerely believed* that they had discovered stainless steel, knowing as only they could the thought processes and experiments which led to the discovery" (emphasis supplied).

Conclusion

In light of contemporary historical research, Haynes' claim to have been the inventor of the American automobile and America's first car are contradicted, but it was not always so. He was a competitive man, obsessed one might say by the need to be first in any field he entered, and firmly convinced that he was. Given what appears to have been confusion and a lack of clarity on the "which was first" topic during his lifetime, his continuing claims to have invented the American automobile become more understandable. He could not imagine that he might be second. Today he might be a bit consoled to know that history does regard the Haynes-Apperson as the first automobile to be manufactured in series in what became the automotive heartland of the United States.

Fig. 4 – Haynes' subtle dig at the Appersons (from the editor's collection).

EDITOR'S NOTES—*continued*

and its Influence." In this issue, we follow our traditional Conference Issue format of publishing some papers and abstracts of the remainder. In choosing the papers, I try to follow the principal guideline for Cugnot nominations: is it "new" history or "old" history presented in a new light.

We begin with "Packards From South Bend: Economic Perspectives on 'The Last Packards' Decision, Part 1" by *Robert R. Ebert, Ph.D.*, and Niccole M. Pamphilis. Bob is a member of the SAH board of directors and Buckhorn Professor of Economics at Baldwin-Wallace Collect, Berea, Ohio. He has participated in all six conferences. In five of them, he has examined the reasons for the decline of well-known vehicle manufacturers: Reo trucks and Diamond Reo (*Reviews* Nos. 42 and 43), Stearns-Knight (No. 39), Flxible (No. 36) and Divco (No. 34). His paper on technological change and consolidation of medium-priced automobile manufacturers was abstracted in *Review* No. 32. His co-author, Niccole M. Pamphilis, graduated from Baldwin-Wallace in 2006 with a degree in economics. This article was peer-reviewed by *Robert Neal*, who has had a long-time interest in the non-automotive engines of Packard. Bob is the author of *Master Motor Builders and Packards at Speed*, as well as "By Land, By Air, By Sea—By Packard," which appeared in *Review* No. 35. Part 2 will appear in *Review* No. 47.

Arthur W. Jones, also a member of the SAH board of directors, was the author of "For Official Use Only: The Army Goes Car Shopping," presented at the Dayton Conference in 2004, and published in *Review* No. 42. This time he has given us "American Runabouts Abroad," the story of the earliest American cars in Europe. Arthur is an architect and lives in Philadelphia. This article was peer-reviewed by *Kit Foster*, quite familiar with the era after penning last year's Cugnot winner *The Stanley Steamer—America's Legendary Steam Car.*

Byron Olsen is a familiar name to readers of *Old Cars Weekly* where he has a running column under his own by-line. His article "The Shift From Shift to Shiftless: Transmission Advances in U.S. Cars (1929-55) has been heavily revised and expanded from its appearance in the December 2004 issue of *Collectible Automobile*, which gave Byron permission to publish an expanded version if he so chose. This paper clarifies to me, at least, the distinctions among the many semi-automatic transmissions of the 1930s. Byron is the retired general counsel of the Soo Line railroad and lives in St. Paul, Minnesota. It was peer-reviewed by *Elizabeth Robinson*, a career librarian at the Library of Congress, Washington, D.C., supervising the rare book cataloguing team. Her library career has taken her to the University of Michigan (Ann Arbor), University of California (San Diego), and the Huntington Library (Pasadena). Elizabeth's interest in the mechanical side of vehicles is focused on transmissions. I became acquainted with her during the Third Automotive History Conference in Los Angeles in 2000.

I have lately wondered whether automotive history has any lessons for today's Ford Motor Company and General Motors Corporation, whose woes hearken back to those of Nash, Hudson, Studebaker, and Packard half a century ago. As if in answer to my thought, "Alfred P. Sloan, Jr.: The Prescient Organization Man" by *Jace Baker* and *Pat McInturff*, examines Sloan's methodology and applies it to the situation in which GM finds itself today, an intriguing subject indeed. The two authors (together with C. E. Tapie Rohm) presented at the Dayton conference "The Business School Curriculum: A Study of Automotive History," abstracted in No. 42. Both are professors in the Department of Management, California State University, San Bernadino. The article was peer-reviewed by *Matthew Sonfield*, who is the Robert F. Dall Distinguished Professor in Business at the Zarb School of Business, Hofstra University, Long Island, New York. Most of Matt's research and publications are in Entrepreneurship and Small Business.

After the Abstracts of other papers comes the Haynes book reviews mentioned earlier, given the once-over by *Bev Kimes* to ensure that I wasn't going off the deep end. The issue closes with a farewell message from *Kit Foster*, signing off as Conference Chairman after noble service in getting things together and keeping them going. All those who have attended the Conferences and read their proceedings in the *Review* are indebted to Kit for his time-consuming and often frustrating efforts in the cause of automotive history.

We left South Bend with renewed affection for Studebaker and its colorful history, beginning with the Studebaker Brothers and their wagon business, continuing through its large and handsome luxury cars of the late '20s and early '30s, and its postwar styling triumphs of 1947 and 1953, all lovingly assembled (as the ads tell us) by teams of fathers and sons.

The contributions by our peer reviewers are invaluable and serve to enhance the accuracy, and hence the credibility, of the *Review*. As ever, *Pat Chappell* and Kit did yeoman service as proof readers. Mountain Laurel Press and Arena Press showed their usual good humor and patience in helping get together the latest "show on the road." At 72 pages, this is the largest of the 46 isssues to date.

Letters

***Review* No. 45 (Spring 2006)**
Little Cars on the Big Salt: MG and the Bonneville Salt Flats (p. 23)

As an MG enthusiast, I greatly enjoyed [this article]. . . . Of course, one must point out that the "two marketing errors" are not attributable to anyone at MG, but to the parent company, as John Thornley took the MGA, already well along, to BMC boss Len Lord in 1952 and was nixed largely on account of Lord's having just bought the Austin Healey from Donald Healey. The dragging on of the B model may likewise be laid at British Leyland's doorstep.

There is a vagueness in the treating of chronology at several points in the article that causes confusion, e.g. Phil Hill was not "America's top Formula 1 racer" when he drove at the flats he had yet to drive in F1 (that honor at the time belonged to Harry Schell). On p. 25, we read that founder Cecil Kimber left MG in 1941, and the "post-Kimber management . . . stopped racing." Kimber's authority ended in 1936, and it was then that MG's racing program came to an abrupt end.

It is asserted that "other companies . . . were developing tractable gearboxes . . . " thus implying that the current ones (T types) at MG were not. Though it had non-synchro first, the TC box was a joy to use and was used in most small bore sports racing cars through the '50s (until parts were no longer available), and while less robust, the TD box was equally a pleasure to use.

Ken Miles is said to have "for years raced a number of MG specials . . . including the 'Flying Shingle' . . ." when he drove on the Flats in '54. The "Shingle," his second MG special, made its debut at Willow Springs in March 1955 using one of the Bonneville engines given him by the factory, which he neglected to clean of its castor oil residue, causing the car's retirement.

For the earlier history of competition MGs, the standard reference is John Thornley's *Maintaining the Breed*. The later chronology may be found in David Knowles' *MG: The Untold Story*.

Michael A. Jacobsen
California, USA

It was interesting to learn . . . that a review of *Life*, *Look*, and *Newsweek* for some years of the 1950s revealed no MG ads, and that until the 1960s MG used its British ads in all countries including the United States. . . . To say that . . . is not, of course, to say that every British ad was exported, or that, within those ads that were used abroad, every element was left unchanged. Looking at the variety of styles in British MG copy and illustrations from 1950, for example, I wonder if some TD ads were exported to the U.S. more or less intact, while others received new copy for the American market.

In the 1960s, British and American advertising styles for MG were very different just compare British ads for the MG 1100, which was advertised comparatively infrequently in Britain after its 1962 announcement with the many ads published in American magazines during 1963-65 for the equivalent MG Sports Sedan. These, with an eye to Volkswagen, were much more distinctive within their market than were British ads for the MG 1100 in England.

It would be interesting to compare American and British MG ads from 1947-60, in particular to see how many were adapted as they crossed the Atlantic. Does anyone know how closely MG's advertising was guided, or governed, by the MG company itself and how much was created by its advertising agencies? It's a long shot after so many years, but it would be fascinating to know.

Heon Stevenson
West Sussex, England

See 1949 ad for the MG TC on page 70.

Mann and Overton and the Austin 12/4:
How a Dealership Affected the Future of the London Taxicab (p. 32)

It is true that for the 1937 season Austin passenger cars - except the Seven - adopted Girling brakes but these were mechanical, not hydraulic. Not until 1947 did Austin use hydraulic brakes on its passenger cars, Lockheed full hydraulic on the A125/135 while the A40/70/90 range had Girling hydraulic front brakes and mechanical rear brakes.

The FX3 taxi also used Girling mechanical brakes, with twin leading shoes at the front, identical to those used on the Austin 16 BSI whose engine was also used in the FX3. This 16 was a new model which was ready for the 1939 Earls Court Motor Show, had it happened, but which was not put into production until 1945, owing to World War II.

I would suggest, therefore, that Austin's use of mechanical brakes on its taxis was more to do with current practice at Longbridge rather than any influence that the Public Carriage Office may have exerted.

Andrew Ping
Hampshire, England

The Pennsylvania Auto Motor Company:
A Concise History of the Company and the Car (p. 40)

A Pennsylvania Six ran in the auto races held at San Jose, California, on September 3, 1911. The races on the San Jose Driving Park's dirt track were officially sanctioned by the A.A.A. Contest Board. Considering the date of the races, the Pennsylvania Auto Motor Compay must have been in its death throes at the time.

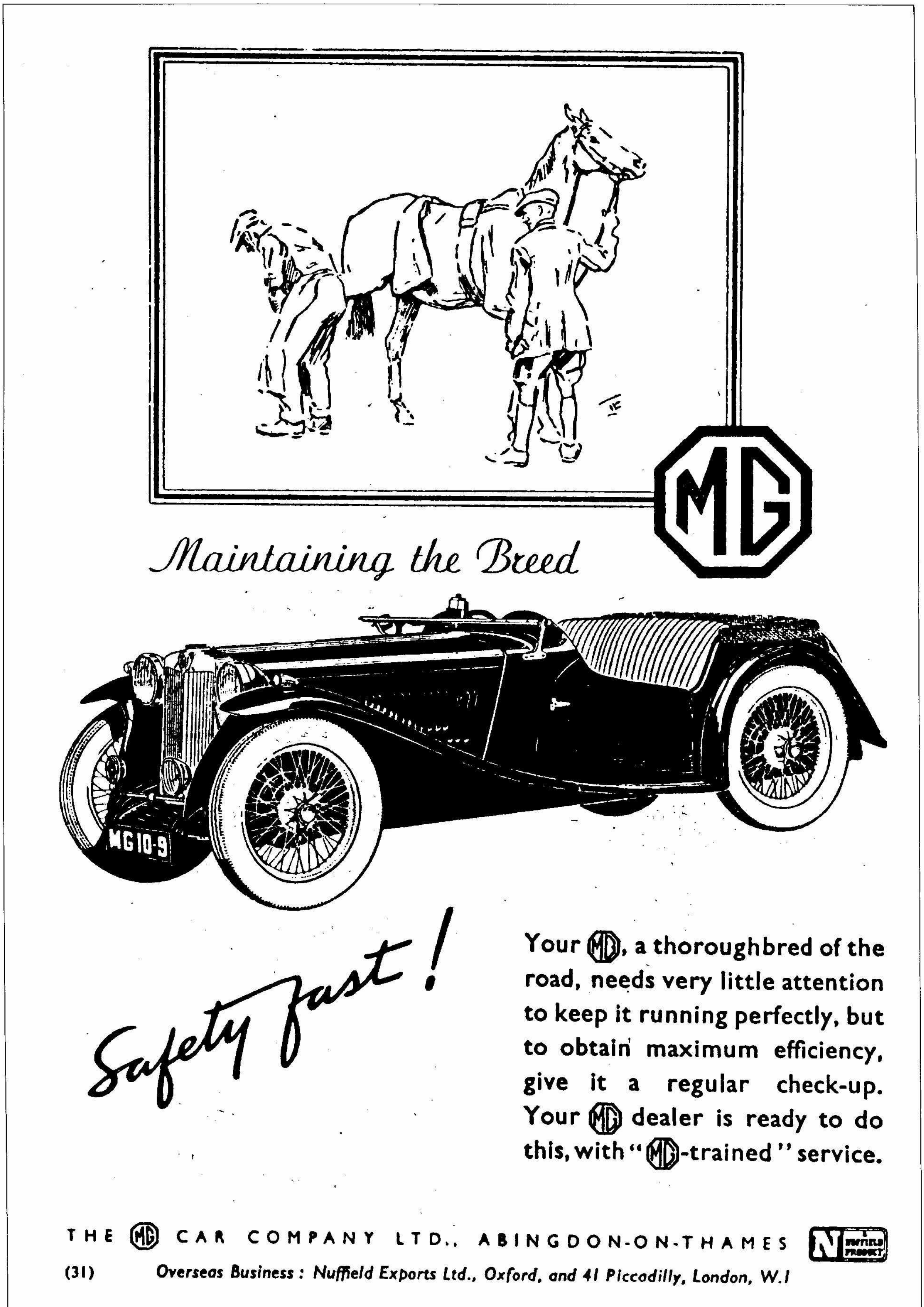
The *San Jose Herald* said the Pennsylvania Six was entered and driven in the races by Earl and Ray Cooper, who apparently owned the car (I would like to know how that came to be). Ray Cooper drove the Pennsylvania Six to a third-place finish in a 15-mile free-for-all race. Earl Cooper won three races driving a Maxwell. His only loss of the day came behind the wheel of a 75 hp Pennsylvania Six roadster. Cooper's loss came in a 5-mile match race against a 70-hp Comet V-8 racing car. The *Herald* described the Pennsylvania as being very fast but "cumbersome" on the track.

John Perala
California, USA

Corrections

George Hamlin, *Stuart Blond*, *Bob Zimmerman*, *John Perala*, and *Lee Miller* point out that the Packard in the 1954 photo on page 47 is a 1952 Pan American, not a Caribbean. Stuart says that the Pan American is "one of six such showcars designed by Richard Arbib and built by Henney," which modified Packard 250 convertibles. According to George, the car was an opalescent green and "slightly updated with the then-current Motor Wheel wire wheels and center dish caps." The car "did a European promotional tour, including an auto show in Germany."

Also on page 47, the letter from *Fred Summers* identifies the commander-in-chief of the Italian army as "Cardona." My error. The original article properly referred to him as "Cadorna."



MG TC ad from The Field, *January 15, 1949*
(supplied by Heon Stevenson).

Message from the Conference Chair

by Kit Foster

This issue of Automotive History Review *comprises the transactions of the Society's sixth automotive history conference, held this past April at South Bend, Indiana, in conjunction with the National Association of Automobile Museums (NAAM). It completes a decade of biennial conferences, but the roots of the conference go much farther back. It was a full 17 years ago that former SAH director Tom Deptulski proposed to the board that the Society organize an event for the presentation of well-researched papers on automotive history and tours of heritage sites related to automobiles and their industry. The rest, as we blithely say, is history, but the history has not made itself. As we ebulliently embark on what should be another productive decade it's appropriate to pause for credit to those people who have made the series a success.*

First and foremost, we should thank Tom Deptulski for recognizing not only the need for such a forum but for believing that SAH could do it, either alone or in conjunction with collegial groups. The first conference, honoring a centenary of automobile manufacturing in the United States, demonstrated that it is possible to have too large a consortium, and it is due to the prescience of Judy Endelman that after seven years of flailing we partnered with The Henry Ford, Dearborn, Michigan, in September 1996 for "The American Automobile Industry: Past Present and Future." Judy recognized a symbiosis with then-nascent NAAM, meeting there coincidentally, and thus was born our longstanding partnership.

After two conferences at The Henry Ford, we realized the value of taking the show on the road, and we have been blessed with host museums in all parts of the United States: The Petersen Automotive Museum in Los Angeles, California; the Auburn Cord Duesenberg Museum in Auburn, Indiana; America's Packard Museum in Dayton, Ohio; and the Studebaker National Museum in South Bend, Indiana. Each of these institutions contributed facilities and services in kind to make the conferences successful, and for recent events handled all the local arrangements.

Credit is due to the successive administrations of SAH, headed by presidents Sinclair Powell, Leroy Cole, Dale Wells, Joe Freeman and Mike Berger and their boards of directors. At NAAM, presidents Shari West Freeman, the late Bob Sbarge, Jim Johnson, Jackie Frady and Wendell Strode and their boards have been essential facilitators.

As SAH's program chair I have been thankful for the continual support of Nick Fintzelberg, Taylor Vinson, John Marino, Sinclair Powell, Leroy Cole, and Doug Leighton as session chairs. Leroy deserves special mention for organizing the audio-visual resources for this conference and transporting all the equipment to South Bend from Michigan. The most important ingredient, however, has been the enthusiasm of presenters, many of whom have been faithful repeat participants. In six conferences, historians and scholars have presented more than 100 papers and participated in two panel discussions.

The seventh conference has been set for Nashville, Tennessee, to be hosted by the Lane Motor Museum in Spring 2008, exact dates to be announced. In choosing this time to retire from the chair of SAH's conferences, I'm proud of what we've accomplished and am confident that the membership will support my successors with the same enthusiasm afforded me.

—Kit Foster

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