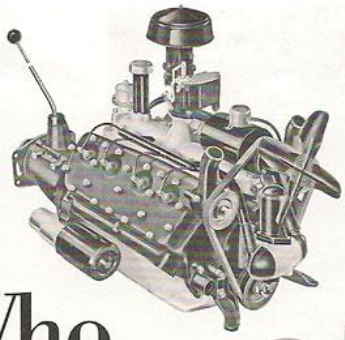


# Who DESIGNED the Ford V-8 Engine?

BY DAVE COLE

THE FORD MOTOR COMPANY has been in business for nearly 107 years now. The company has enjoyed many success stories in all those years, and among the brightest of them was the episode with the flathead V-8 engine. That remarkable engine, conceived and engineered in secret during 1930 and '31, was laid aside in favor of an upgraded 1932 version of the 4-cylinder Model A, then brought back to life in December, 1931, when Henry Ford changed his mind and decided to make the V-8-powered car his main offering for 1932 after all.

The entire company was then plunged headlong into a crash program to get the V-8 into production as quickly as possible. This had all the makings of a disaster, but the company managed to have V-8 cars ready to show to the public within four months of Ford's fateful decision. The earliest Ford V-8's had problems, of course, as the engine was virtually untested and certainly not refined when it first hit the market, but the company worked out most of the kinks during its first and second years in production, and that same basic engine design went on for over twenty years as Ford's main powerplant for its cars and trucks—even longer than the remarkable Model T 4-cylinder job that had first brought Henry Ford and his company to worldwide fame and great wealth. By August, 1933, the Ford V-8 engine was strong enough and reliable enough to take the first seven places in that year's running of the Elgin Road Race in Illinois, as we saw in the July-August *V-8 Times* last year. And Ford V-8's kept winning races in 1934 and later, too.

Indeed, Ford's first V-8 turned out to be a much better engine than was necessary to meet its competition, and may have been better than Henry Ford himself intended it to be. In 1932, the V-8 had a compression ratio of 5½ to 1 and yielded a rated 65 brake horsepower, so it was on par with that year's Plymouth 4-cylinder job, and a bit stronger than Chevrolet's 60 h.p. "stovebolt" six. Higher compression and other improvements let the V-8 crank out 75 horsepower in 1933, and 85 in 1934 and for many years after. By 1953, when Ford last offered a flathead V-8 to U.S. buyers, the displacement had been increased from 221 cubic inches to 239, the compression ratio was up to 7.2 to 1 and the horsepower up to 110, yet it was still essentially the same basic engine Ford had introduced in 1932.

The engines used by Ford's competitors had undergone similar increases in displacement, compression ratio and power output over the years. By 1953, Chevy's 6 had 235 c.i., a 7.1:1 c.r., and put out 115 h.p.; Plymouth's 6 had 218 c.i., 7.1:1, and made 100 h.p. But those engines were just about at their limit of development, while Ford's V-8 was not. But Ford did not do any more upgrading on the flathead V-8. Overhead-valve V-8's were the latest thing, and Ford brought out theirs in 1954.

But if Ford did no more with the flathead V-8, others did, and had been doing so since the mid-'30's. Ford V-8 racing successes had called attention to the possibilities in that engine, and soon back-yard mechanics and early hot-rodders were getting lots more power and speed out of Ford V-8's than the factory ever intended. They found you could hop up a Ford V-8 and it would usually hold together, but if you tried hopping up a competitor's engine in a similar fashion, you risked catastrophic failure, with thrown rods or a broken crankshaft likely. The basic engines used by others were sturdy enough to do their job, all right, but the Ford V-8 had all kinds of potential beyond what was necessary for a passenger car.

Did Henry Ford intend to build that V-8 so much stronger and sturdier than it needed to be? Or was it the engineers who developed Henry Ford' s ideas and suggestions, taking their direction from the old man and making his ideas work, or proving beyond any doubt that they would not work? What was the point of it? Henry Ford decided on building the V-8 mainly because the four-cylinder engine was no longer considered viable in the new car market, but he would not build a six-cylinder engine because that was what the other makers in the low-price field were already doing. The novel X-8 engine Ford had


■ **Visitors to Ford's Greenfield Village pay little attention to the Fort Myers laboratory, not realizing that this nondescript building was the site where the famous flathead Ford V-8 engine was designed. Photo by Charles Seims, 1973.**

worked on in the 1920's had never proven successful, so that left a V-8 as the only reasonable choice. It would be the first V-8 in the low-price field, and to make sure it would not cost more than $50 more than a 4-cylinder Model B, Ford had to keep the V-8's design as simple as possible. The engine block would have to be made in one casting, with crankcase and both banks of cylinders as well as part of the clutch housing all in one piece. Experienced foundry men said it could not be done, but Henry Ford showed that it *was* possible, and although the problems to be solved were daunting, Ford's Rouge factory engine plant was turning out three thousand engines a day within four months of the start.

One would think that such a revolutionary engine—a smooth V-8 in a low-priced car for the first time, with all kinds of unique features that had never appeared on any other V-8 regardless of price—would have piqued the curiosity of automotive writers, who would ask about the design and who had done it. But apparently nobody asked, and Henry Ford had demanded that the design work be done in secret, so that even after the engine was in production, the engineers who had worked under his direction in developing the V-8 said nothing about it.

Indeed, the story about how and where the V-8 engine was designed remained untold for over twenty years! But after Henry Ford's death in 1947 and his wife, Clara's, in 1950, the Ford Motor Company realized that a corporate archives should be established to preserve Henry Ford's papers and the historical documents relating to the company he founded. Thus was established the Ford Archives, and as a part of it, an Oral History Section undertook the job of interviewing former Ford employees and people who had known Henry Ford. Experienced interviewers asked questions of these people, and their reminiscences were recorded on tape. Typists then transcribed the interviews onto paper, and the pages were bound into books that became part of the archives. Over three hundred of these transcribed interviews resulted from this effort, and among those interviewed were some of the engineers who had designed the V-8 engine under Henry Ford's direction over twenty years earlier. Fred Thoms, who had been an engineering assistant on the V-8 job, was one of them, but the engineer who provided the most information about the development of the V-8 was Emil Zoerlein, who had devised the ignition system for Henry Ford after Ford's first choice for that job, Ed "Spider" Huff, told Ford that his idea about driving

the distributor off the end of the camshaft wouldn't work. Zoerlein's *Reminiscences* filed in the Ford Archives run 256 pages, much of which has to do with matters other than the development of the V-8, but includes what must be the first detailed information concerning that project to be put into print.

But detailed though his account is, Zoerlein told mostly about what he himself had done, mentioning only what he could remember about work that others did. Twenty years or more had passed since those days, and who can recall all the details of one's job after so long a time?

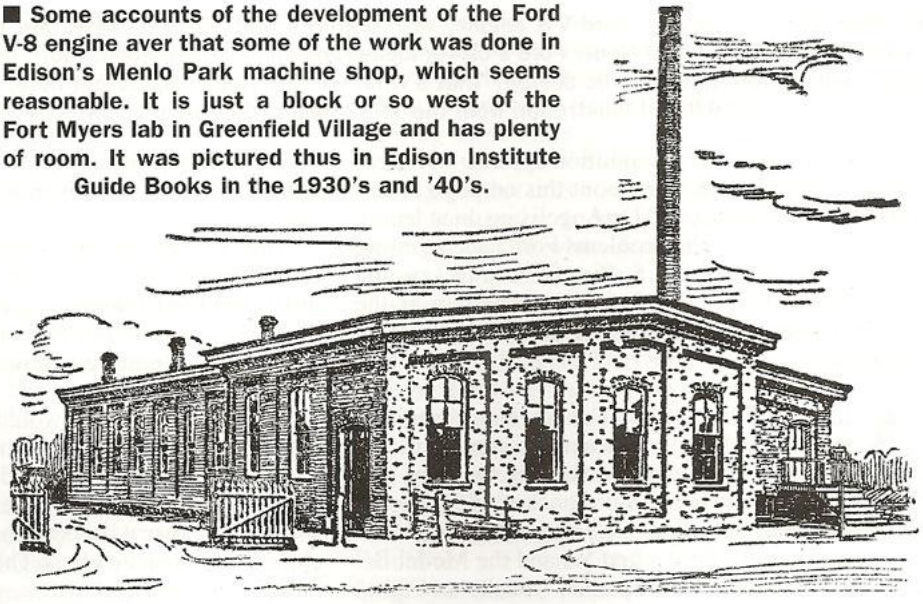
It appears that the first authors to make use of these reminiscences by Fred Thoms and Emil Zoerlein were Allan Nevins and Frank Ernest Hill, who wrote the detailed history of the Ford Motor Company in three volumes that are still highly regarded as giving the best coverage up to 1962. The second volume in the set is titled ***Ford: Expansion and Challenge, 1915-1933,*** and was published in 1957. Pages 594 and 595 in that book tell about the development of the Ford V-8, but only briefly. They tell how "under Ford's direction, Carl Schultz and other engineers working in the Edison laboratory had laid out the first V-8 engine in May, 1930 . . .", another in November, then 25 to 30 more, always trying to simplify the design and reduce the cost. Footnotes in the back of the book tell about the *Reminiscences* of Zoerlein and Thoms the authors had consulted.

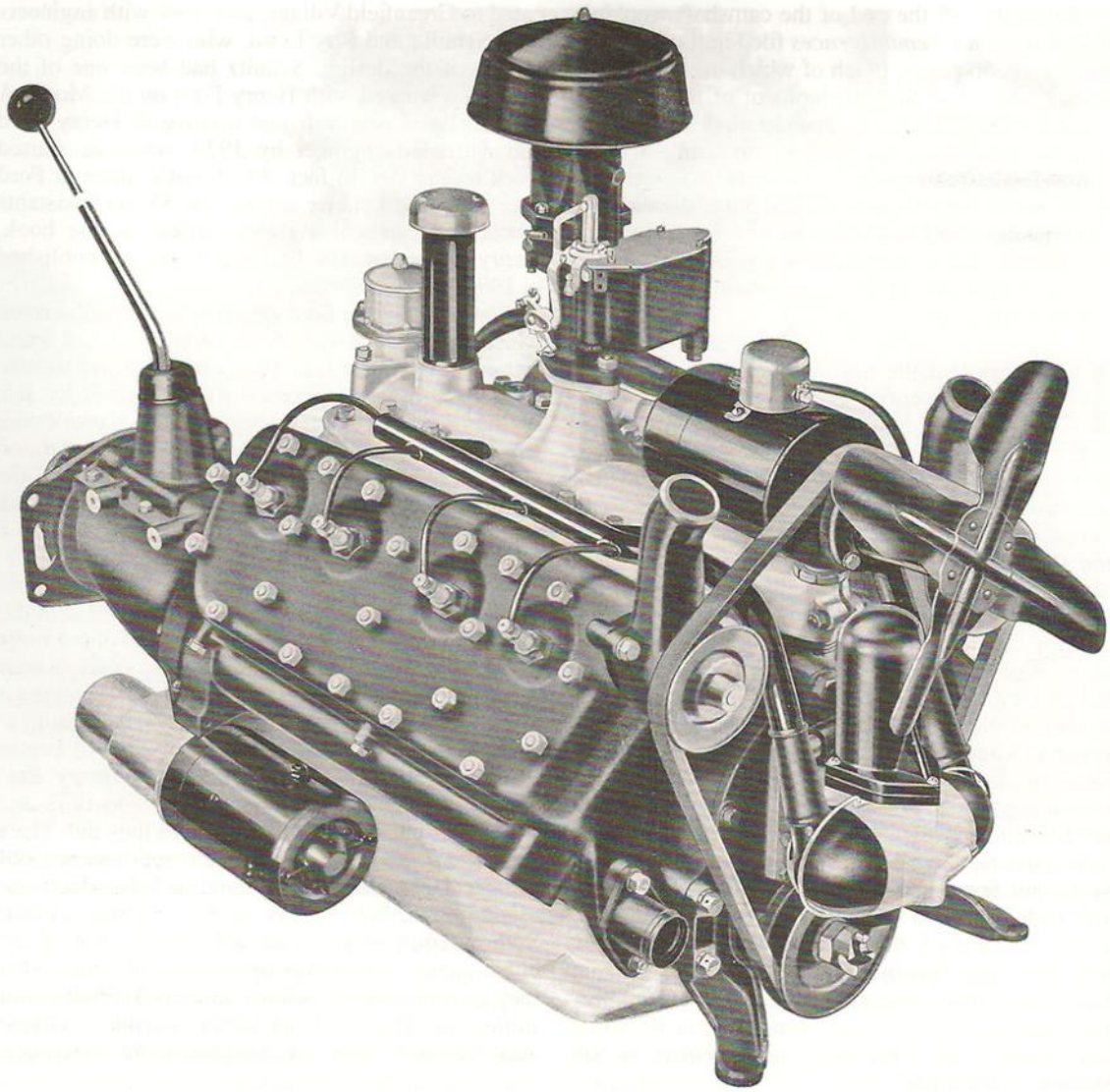
But the Nevins and Hill trilogy was a scholarly work, and few car guys bought the set, and fewer still waded through the 1,910 pages of small print, so not very many V-8 enthusiasts learned about how and where our favorite engine was designed from that source. Thus, when the late Lorin Sorensen, former editor of *The V-8 Times,* discovered in 1972 that Emil Zoerlein was still living in retirement in San Marcos, California, he went to visit the former Ford engineer, and wrote a series of three articles for ***Ford Life*** magazine that he was then publishing. Most serious V-8'ers subscribed to *Ford Life,* so Lorin's articles gave them the first detailed description of the development of the Ford V-8 engine that they had ever read. Zoerlein recounted how he had been told to report to the old Fort Myers lab that had been relocated to Greenfield Village, and work with engineers Carl Schultz and Ray Laird, who were doing other phases of the design. Schultz had been one of the men who worked with Henry Ford on the Model A engine; Laird was a distant relative of Henry Ford and a trusted engineer by 1930, when he started work on the V-8. In fact, Ray Laird's career at Ford was such that he was among the 35 top assistants whose biographical sketches appear in the book, ***Henry's Lieutenants,*** by Ford R. Bryan, published in 1993.

Sorensen's three *Ford Life* articles about Zoerlein, which appeared in Volume 2, Numbers 5 and 6 and Volume 3, Number 1, in 1972 and '73, seem to have been the primary reference material used by Jim Norris in writing his four-page article, **"Developing the First V-8,"** which appeared in the 4th Edition of ***Petersen's Complete Ford Book*** in 1976. Like Lorin, Jim names only Schultz, Laird and Zoerlein as engineers who worked on designing the Ford V-8 engine.

One would suppose that Edward P. Francis and George De Angelis, both of them longtime Ford Motor Company supervisors with a passion for early Ford cars and the company's resources to draw upon, would have something to say about the development of the Ford V-8 engine in their book, ***The Early Ford V-8 as Henry Built It,*** described as a "Production facts book, 1932-38," which was published in 1982. Indeed they did. These meticulous researchers and writers tell how in 1928, Ford had one C.J. Smith design a V-8, which was a failure, and how he had another engineer, Arnold Soth, attempt another one, a 60-degree V-8 of 299 cubic inches, which was not successful either. Then they go right into the Schultz and Laird collaboration in the Fort Myers Edison lab in Greenfield Village, and mention some of Zoerlein's *Reminiscences*

■ **Some accounts of the development of the Ford V-8 engine aver that some of the work was done in Edison's Menlo Park machine shop, which seems reasonable. It is just a block or so west of the Fort Myers lab in Greenfield Village and has plenty of room. It was pictured thus in Edison Institute Guide Books in the 1930's and '40's.**





■ **There it is, the famous Ford V-8 engine, with features that made it unlike any other V-8 engine made before or since. It's full of Henry Ford's clever ideas (and some not so good, too!), but who put his plans on paper and created this specific design? That's what we're trying to figure out here, and it's not as easy as you'd think! Illustration from the 1932 folder, "Features of the New Ford V-8."**

about Ford's ideas for the ignition system. But there are only a few paragraphs about this on page 9, following which Francis and De Angelis go on at length about the solving of the problems Ford had in getting the V-8 into production. Suffice it here to say that they name only Schultz, Laird and Zoerlein as the engineers who designed the V-8 that was ultimately successful.

Although Francis and De Angelis cover this subject well, if you want the most detailed treatise on the development of the Ford V-8 engine, you have to read Tony Thacker's 1984 book, ***'32 Ford: The Deuce,*** described as "A formal and sporting history of Ford's first V8 and the Model B." Thacker devotes all of Chapter 3, "'Make an Eight,' says Ford," to this subject. It is six full pages long, and in addition, there is more on this topic in other chapters.

This is the most extensive coverage yet on the design phase of the V-8. It tells how Henry Ford instructed Fred Thoms to go out and buy examples of all the V-8 engines he could find, so they could be studied. Thoms got nine old V-8's of assorted makes, cleaned them up and presented them for inspection. The Ford V-8 would be like none of them, but it was useful to have them so Henry Ford and his engineers could see first-hand how others had solved the problems they would face in designing their own V-8. Many other writers we have mentioned here included this vignette about Thoms and the nine V-8's in their own stories.

But for all its elaborate detailed history on the 1932 Ford V-8, Thacker's book cites only Carl Schultz, Ray Laird and Emil Zoerlein as the design engineers who worked on it, besides Thoms.

Perhaps the most unusual aspect of Thacker's '32 Ford book is that he, his book, and its publisher are all British, not American! At the time he wrote the book, Thacker was the editor of an English monthly magazine called *Custom Car,* yet so steeped was he in Ford V-8 lore—'32's in particular—that this seminal tome was the result.

Two years after Thacker's '32 book came out, another Brit wrote a one-volume history book titled, ***Ford: The Men and the Machine.*** This was Robert Lacey, whose half-dozen earlier books were about British subjects, so it is something of a mystery how he became so interested in Henry Ford, his company and his descendants as to write a 778-page book detailing it, but that's what he did. He even moved his family to Detroit and lived in the area for the two years it took to gather the material and write the book.

Needless to say, the episode concerning the development of the Ford V-8 is just a small part of the eighty-odd year Ford history that Lacey crammed into those 778 pages, but it's in the book—pages 309 and 310—but only Fred Thoms is identified by name.

Perhaps the most recent book to cover the development of the Ford V-8 is Robert Genat's ***Deuce: 75 Years of the '32 Ford,*** which was published in 2006, just in time to be available for purchase all during 2007, the 75th anniversary year of the '32 Ford. The book is largely devoted to hot rods, since a huge proportion of surviving '32 Fords have been modified in that fashion (and a lot more built to look like them out of newly-made parts), but there is plenty about stock '32 Fords, too, including about four pages on the development of the original V-8 engine.

Like many of the other books we have cited, Genat's tells about Fred Thoms going out to buy as many V-8's as he could so they could be studied; it runs through the story about the earliest attempts at designing a V-8 which failed for one reason or another, but gives the names only of those engineers who worked on the last design that ultimately went into production. As usual, we read about Carl Schultz, Ray Laird and Emil Zoerlein, working secretly in the Edison laboratory from Fort Myers, Florida, which was in Greenfield Village by the time this work was done.

It's hard to think of ***Automobile Quarterly*** as a magazine, as it certainly looks like a book, with book-like hard binding, end papers and so on, but the title page assures the reader that it is indeed "The Connoisseur's Magazine of Motoring Today, Yesterday and Tomorrow." It has been published every quarter since the spring of 1962, and in all the years since, the early Ford V-8 has been featured at least twice.

In *AQ*, Volume 12, Number 3, 1974, a well-illustrated 34-page article entitled **"Last Act: The V-8 Years of Henry Ford"** appeared, but its author, the late Beverly Rae Kimes, skipped through the V-8 engine development in a single paragraph that names no names or places.

Twenty-two years later, *Automobile Quarterly* revisited the history of the Ford V-8 in an article by Mike Mueller called **"8 for the price of a 4: Ford's Fabulous Flathead."** This story ran only half the length of the earlier one but with fewer illustrations, and it touched on bits of V-8 history that the first one missed. In recounting how the V-8 was brought about, Mueller tells again how Fred Thoms gathered nine V-8's of other makes so they could be studied—the same story so many others had included in their books and articles. He mentions the early attempts at designing a Ford V-8, including the one C.J. "Jimmy" Smith worked on, which was not successful. Then he goes on to tell about the team headed by Carl Schultz in the old Fort Myers Lab in Greenfield Village. Eventually working with Schultz, according to Mueller, were Ray Laird, Emil Zoerlein and Fred Thoms . . . and Jimmy Smith, Lew Walters, Bob Heime, and Don Sullivan.

***What? WHO?*** Schultz, Laird, Zoerlein and Thoms we know about, because they have been named in nearly every article and book on the subject since the Nevins and Hill book came out in 1957, and we have seen a reference or two concerning C.J. "Jimmy" Smith, but what about Lew Walters, Bob Heime and Don Sullivan? What had Mike Mueller consulted that all the others had missed? Where did he dig up these mysterious guys? Alas, *AQ* is not a scholarly journal with extensive footnotes and references; it is meant to be read for pleasure, so no sources are listed at the bottom of the page or in the back of the book, as they are in the Nevins and Hill trilogy.

But it turns out that Mike Mueller is not alone in citing these other guys as having been in on the design of the Ford V-8. We have yet to find anything else in print that tells how Lew Walters or Bob Heime contributed to the design of the Ford V-8, but there are references to what Don Sullivan did. One says, "When Henry Ford needed a V-8, Don Sullivan gave it to him"; another says in the subtitle, "Don Sullivan helped build Ford's first V-8," and a third one claims that "master designer Don Sullivan has had his hand in every Ford V-8 for more than fifty years."

Well, it seems there is more to this story than one would expect from reading all the usual books on the subject. But we're out of space here, so we'll have to try to dig to the bottom of all this in the next article. It does seem that Schultz, Laird, Zoerlein and Thoms should not get *all* the credit for helping Henry Ford design his famous flathead V-8 after all!



END