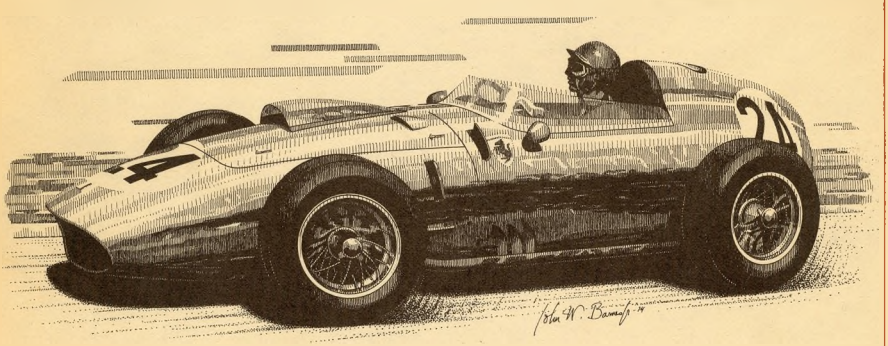
FERRARI:

25 Years of Formula 1



by John W. Barnes, Jr.

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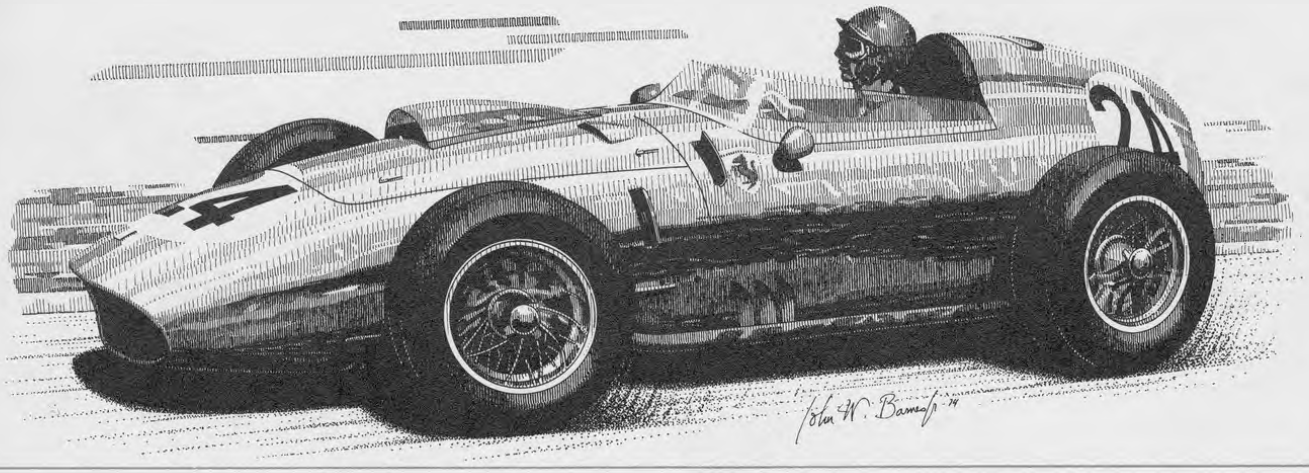

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Introduction by Karl Ludvigsen

John W. Barnes, Jr. Publishing Inc. Scarsdale, New York

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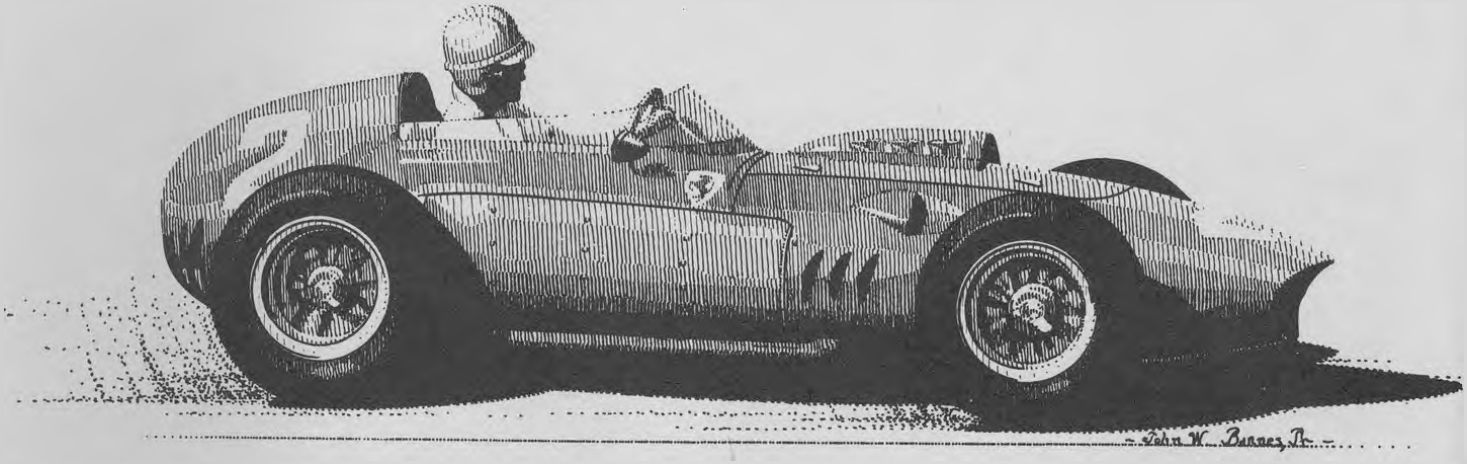
John W. Barnes, Jr.

Preface

As Enzo Ferrari himself once said, Formula I racing is the most pure, and presitigious form of automobile racing, and the one he loves most dearly. It requires the most work, the most ingenuity and the most patience, the rewards of success being negligible other than a complete satisfaction at having beaten the best.

Up until now very few books or magazine articles have covered Ferrari's Formula I efforts as a separate subject or in any detail. Usually, it was a cursory glance, or too intricately threaded through general histories of the Ferrari firm.

This present book, then, is an attempt to convey, in both artwork and commentary, a direct and unified history of Ferrari's involvement in Grand Prix racing. The subject is an intriguing one, and becomes even more so with closer study when it is realized how much of a passion racing is for the Ferrari firm, how consistently unique the cars are, and how much they are really the product of one man.

The 25 cars drawn represent the 25 major Ferrari Formula I models from 1948 to the present. While arranged chronologically, the coverage is not year by year but rather car by car, as in one instance (1952-53) there was no Formula I racing, and in other instances one model was raced for two or more seasons.

These 25 drawings were done without interruption over a period of five months, while the research for them and the commentary required another two. My most heartfelt thanks are conveyed to Mr. and Mrs. James Stoufer, who were enthused about the book from the very beginning, and who commissioned the artwork. I have a special appreciation for Karl Ludvigsen, not only for his splendid introduction, but for his invaluable aid and assistance with research material. He is thoroughly knowledgeable on all automotive subjects, including every aspect of Ferrari. A final thanks is due, first, to Mr. and Mrs. David L. Van Schaick, who also supported the book in many important ways, and, most importantly, to Alicia, who besides setting the type and aiding in other practical matters, was ever patient and continually encouraging.

John W. Barnes, Jr.


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Introduction by Karl Ludvigsen

What matters the appearance of a Grand Prix car? Isn't it to be judged by what it does, not how it looks? That might be true of a German car, or a British car, but for an Italian racing car to neglect the values of appearance would be both uncharacteristic and unforgivable. In the Italian society the way things look, the way they seem to be to others, is considered just as important as the way they actually are. The concept of "face" has an almost Oriental weight. It accounted in no small measure for Enzo Ferrari's reluctance to abandon the traditional and magnificent front-engined racing car and take up the bug-like rear-engined Cooper style that the Italian press had so joyfully ridiculed — until it started winning.

Has there ever been an ugly Ferrari racing car? Of course your answer would depend on your definition of beauty and its antithesis. Perhaps the first monoposto from Maranello was not too handsome, and there were awkward offspring at times of transition, the first rear-engined car, for example. Some were a touch too brutal to be beautiful: the 1951 4.5-litre, the 1956 Lancia/Ferrari. Even these were tidy, tough-looking, aggressive motorcars, as imbued as all their prettier brethren with a sculptural unity, a sense of having been carved from a slab of Carrara marble by the same all-powerful hand, wielded by a Titanic artist obsessed with the machinery of speed.

Thus these lean, purposeful, single-seater cars were shaped by and for Enzo Ferrari as the "face" expressing his will and personality to the world. Their forms also express another Italian attribute: an innate concern for the rightness of structure and shape. Once a dominant dictum in world design circles, the notion that "form follows function" is largely discredited today. The device that works best is not necessarily the most pleasing to look at. But the most junior designer standing before his board at Maranello creates a synthesis of form and function because he has been bred to do so over centuries; he could not do otherwise.

Where he is not limited by the laws of physics and material strength, the Ferrari engineer by instinct creates beautiful textures of ribs and fins, harmonious housing profiles, and structures as agreeable to the eye as they are to the unsentimental calculations of the stress analyst. Display space in any art museum could be devoted without embarrassment to the first 2-litre 4-cylinder, the brake drum of the 1954 car, the Dino V-6 in any of its many forms, and the entire Type 312 B of 1970, one of the most handsome Grand Prix cars ever made, a breathtaking tribute to man's capacity to conceive and to build.

In recent years only BRM and Matra have rivaled Ferrari in their ability to make from scratch all the elements of a Grand Prix car. Only his marvelous self-contained plant at Maranello, built during World War II, has allowed Enzo Ferrari to manufacture the tightly integrated racing cars his engineers have designed. It also freed him from dependence on ready-made pieces and allowed him to break, as he has so often, with conventional notions of car design.

Only once, when he built a 1.5-litre V-8 in 1964, could Enzo Ferrari have been accused of imitating rather than innovating in racing engines. His adoption of the complex V-12 for his first G.P. car in 1948 was considered terribly daring; so was his apparent gamble on the unsupercharged engine in 1950 and '51 that single-handedly ended the thirty-year reign of supercharged power in Grand Prix racing. Later in the Fifties Ferrari's fours and vee-sixes were pathbreaking in their time, as were his flat-twelves of 1.5 and 3 litres in the next decade. Ferrari has confessed that engines are his abiding passion; his small firm has developed more than 150 different types.

Its effervescent creativity has been out of all proportion to the size of Ferrari's establishment at Maranello. All these Grand Prix cars have been powered as much by Enzo Ferrari's drive to compete as by the racing fuels in their tanks. To race he has needed cars, and to get them he has, since he broke with Alfa Romeo in 1939 — and with the exception of an infusion of Lancias in 1955 — built his own. To design them he has engaged some of the ablest engineers available, over the years such men as Colombo, Bazzi, Lampredi, Jano, Fraschetti, Chiti, Bizzarrini, Parkes, Rocchi, Massimino, Caliri, Forghieri and, until his death in 1956 at the age of 25, his son Alfredo "Dino" Ferrari.

These men have also designed Ferraris for the street, cars built to be sold, and some wonderful automobiles have resulted. But this has always been more burden than joy for Ferrari, an annoyance he suffered for the sake of his economic survival, a distraction of which he was relieved by his 1969 alliance with Fiat. Ferrari Grand Prix entries have been for their own sake, out of sheer devotion to this most elevated and elegant plane of motor racing, not for so crass a purpose as the promotion of a line of automobiles. Yet so vividly persistent has been the Ferrari racing effort, conjoined with an unbroken succession of exciting V-12 road cars, bodied with consistent good taste by Pininfarina, that one of the greatest marques in the history of wheeled vehicles has been created in the short span of time since 1946.

Some measure of Enzo Ferrari's elevation of sport above commerce has been his virtual refusal to sell his Grand Prix cars. The qualifying "virtual" is called for because he has parted with some of them in running condition. Most escaped before the early Fifties, when the money they brought was urgently needed. Some were sold with sports car engines so they'd be suitable for Formula Libre events, but not for Grand Prix racing. And some have been presented to museums on the strict condition that they not be raced. In his reluctance to give up his Grand Prix cars Ferrari resembles Mercedes-Benz and Alfa Romeo and breaks with Ettore Bugatti, to whom he is in other ways a spiritual successor. Rightly he does not relish the notion of seeing his cars racing, bearing his name, without the close support he knows is vital to their success.

In every season since 1948 Ferrari cars have competed in major races run to the prevailing Grand Prix Formulas. In both depth and duration this record is unequalled. It is only approached, but not matched, by Alfa Romeo and Bugatti, neither of whom has built Grand Prix cars since the 1950's. Ferrari's affection for the G.P. sport is well illustrated by the timely support he has always given it. His first postwar engine had a displacement of 1.5 litres because he planned to use it in Grand Prix racing, for which that was one of the prevailing sizes. His entries of several cars with 2.5-litre engines in 1951 helped encourage the FIA to adopt that size, late that year, for the new Formula starting in 1954. Instead of resisting it, as the British builders did, Ferrari strongly supported the 1.5-litre Formula that was adopted in 1961.

Not all these cars have been successful but in their relentless assaults on their Grand Prix competitors they have compiled a record that is without equal. As this was written a Ferrari had been the mount for the World Champion driver six times, more often than any other marque. Of the seventeen nations that have staged World Championship races, Ferraris have scored victories in all but three: Brazil, Sweden and, oddly, the United States. By winning the German Grand Prix nine times, Ferrari cars have set an all-time record for the number of wins in any national G.P. event. And Ferraris have won in Italy eight times, seven times in France and England, and five times in Holland and Belgium.

The aura of these many golden crowns envelops every car that bears the Ferrari name. If that car is a single-seater on a Grand Prix starting grid it carries, in its flaming crimson form, the hopes of all Italy, of all who love the purity and power of the Grand Prix sport, and of the Merlin of Maranello, Enzo Ferrari.

FERRARI:
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125 1948

On reflection, there can be no doubts that this car was going to be built. After World War II, Enzo Ferrari was past his youth, and in command of decades of experience in the driving, building, and racing of automobiles. He had a factory and organization large enough, and with money enough, to construct his own cars now.

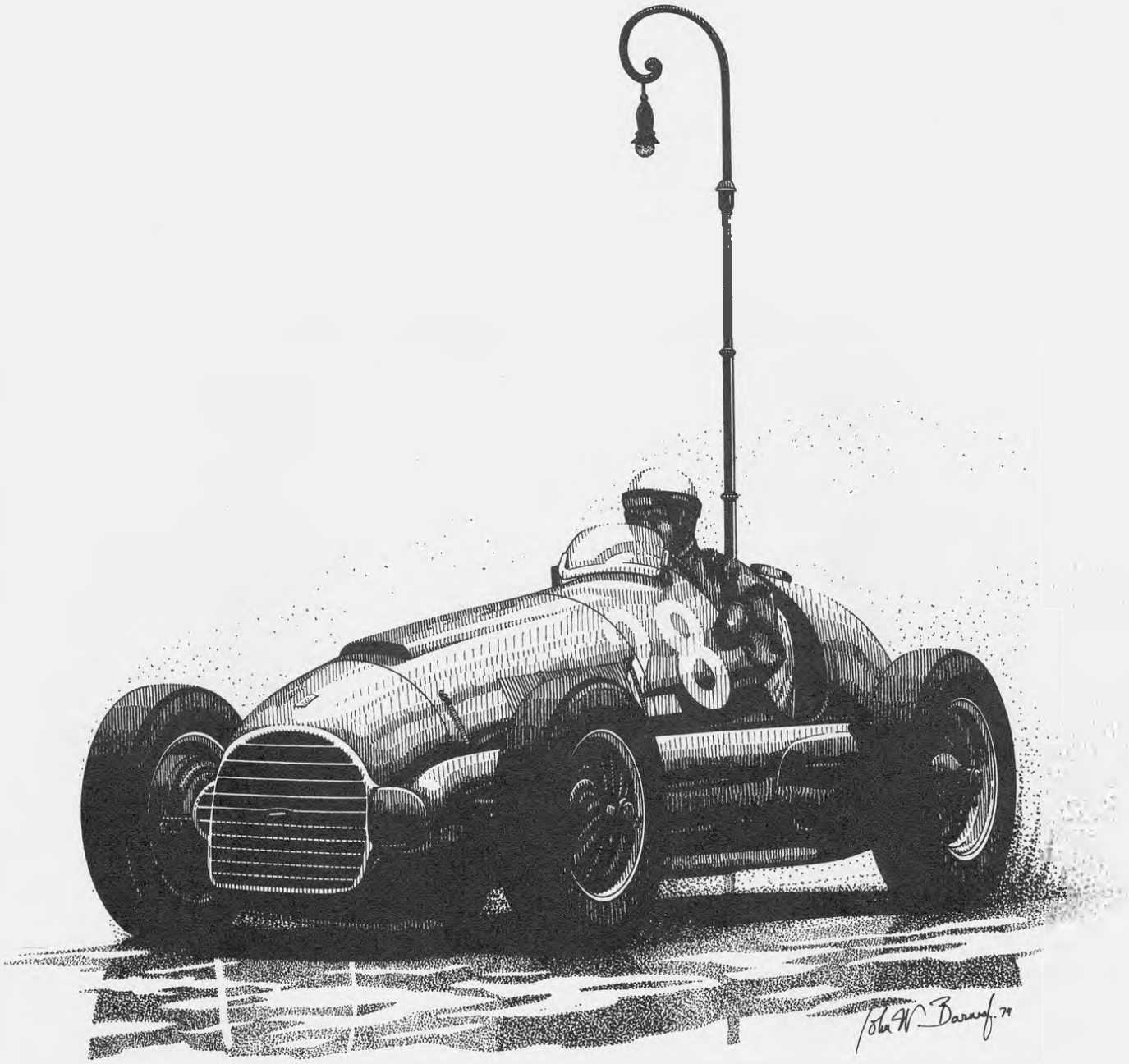
The only other element needed was a single-minded enthusiasm to race motorcars, and that, as friends, competitors, and the racing public were to learn, was the most undeniable asset of the whole Ferrari organization over the years. Through success and failures, strikes, shortages, and setbacks, Enzo Ferrari's desire to race would be paramount and indefatigable.

This new Formula I car, the 125, first appeared at the Turin G.P. of 1948. Based on ideas that Ferrari had developed during the war, while his factory was producing war materials, it was surprisingly innovative when compared with the updated pre-war cars that it raced against. The body was quite light and small, low and squat, with a bulbous nose, flanked on each side by smaller cowls over the front suspensions. Inside, the chassis had two main tubes running the length of the car, on which sat a whole network of crossmembers and tubular super-structures to support the bodywork and main operating components. The early suspension was a transverse leaf spring, wishbones and shock absorbers in the front, torsion bars and shock absorbers in the rear.

Propelling all of this was the new V-12, primarily the work of Gioacchino Colombo, an old friend of Ferrari's. The two banks of six cylinders sat opposed at 60 degrees to each other and had two valves and one plug per cylinder, one overhead cam, and a capacity of 1497 cc. The supercharger, allowed under the existing formula, was a Roots-type mounted at the front of the engine. The 5-speed gearbox, clutch, and final drive were all rather eclectic due to post-war material shortages, and it was these transmissions that failed on most of the cars in the four races they entered. At the Turin G.P. then, Raymond Sommer finished 3rd, while Prince Bira broke and Guiseppe Farina crashed, although not seriously. At Monza, Sommer retired from an illness, while Farina broke down. The 125 won its first race at the small Circuit of Garda, unopposed and in the hands of Farina. In the final race at the Penya Rhin Grand Prix, all three cars broke, but satisfaction was apparent as the racing team was now well-organized and the cars were on their way.

In this first year, in sometimes obvious, but more often, subtle ways, the whole future pattern of Ferrari in Formula I racing was seen: the uncanny ability to produce a new engine and car in very short order, a complete car, finished and polished, ready to race, needing no development, and often winning its first time out; the adroit use of that brilliant handful of engineers, first Colombo, and later Lampredi, Jano and Rocchi, who at various times, not only inspired the Ferrari firm, but other Italian auto firms as well; also, and at times regrettably, that passion for intrigue endemic to the Italian soul, that would alternately reward and damn designers, bless and break drivers, please and frustrate sponsors, and make the practical business of motor racing an amazing exercise in barely controlled chaos.

Pages 12-13 Ferrari's very first Grand Prix car, the 125, made its racing debut at the Italian G.P. at Turin in 1948, driven by Raymond Sommer.



125 1949-1950

If on the books the Ferrari team's efforts in 1948 did not appear too successful, their potential was sagaciously realized by the other competitors, leading Alfa Romeo to withdraw in 1949, partly because, it was said, they believed their 158's to be uncompetitive against Ferrari's improved 125's. And the 125's were very much improved, with severe handling faults somewhat corrected by a new rear independent swing-axle suspension set-up. At several races in the beginning of the year, the private entry of Peter Whitehead did poorly, as did that of Tony Vandervell with his "Thin Wall Special." (Vandervell's factory in England produced the steel-backed thin-wall plain bearings used in Ferrari's 125 engine, this type of bearing being a departure from the more usual ball or roller bearings.)

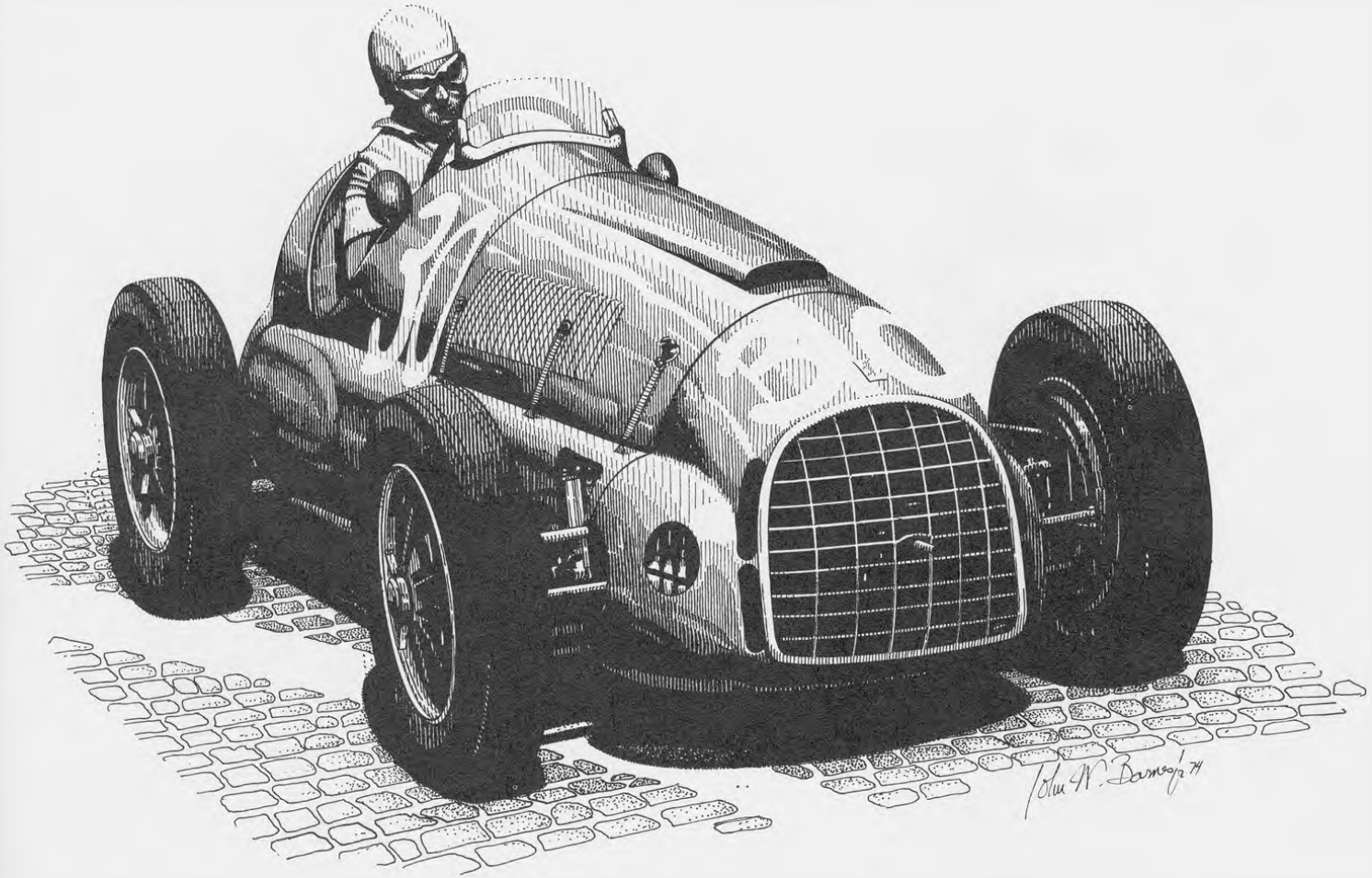
When the works team began racing at the Belgian G.P. at Spa, things improved immediately. Luigi Villoresi, the "old man" of racing at the time, and Alberto Ascari, young, smooth, and persistent, were signed on by Ferrari, and they made an inseparable pair, staying with Ferrari through 1953. The Ferrari all but won that race until they stopped for fuel, allowing the more economical unsupercharged 4.5 litre Lago-Talbot of Louis Rosier to get by. The ensuing gap could not be closed, and Rosier won.

At the shorter Swiss G.P. at Bremgarten, Ferrari won his first major Grand Prix title against strong opposition. With new transverse leaf rear suspensions, Ascari and Villoresi won over Sommer's Talbot and Farina's Maserati. At Zandvoort, Silverstone, Monza and Masaryk, the Ferrari were supreme.

Their chief opposition, though, the Maserati 4 CLT/48 in the hands of Farina and Fangio, was becoming steadily more powerful and reliable, so at the Monza race, Ferrari displayed two new 125's, these having engines with two overhead cams per bank, and two-stage Roots superchargers. Chassis modifications were made as well, all geared to making the car better balanced to correct chronic handling difficulties.

What satisfaction that was gotten from this now superior car quickly dissolved when Alfa Romeo announced their return to Grand Prix racing for 1950. Immediately the 125 was again outclassed, and while work progressed on a new unsupercharged engine, the 125 had to make the attempt. Even with a new de Dion rear suspension, the cars became slower and more dispiriting, breaking down in race after race as more attention was given to the new 375. Alfa Romeo, with drivers of such talent as Juan Fangio, Farina, and Luigi Fagioli, totally dominated the year. Midway through the season, the 125's were retired into the hands of private owners, where success with the car was sporadic at best.

Pages 14-15 — The later 125's, with a two-stage supercharger, did very well in competition, Ascari sliding here over the brick surface at Bremgarten, winning the Swiss G.P. of 1949.



375 1950-1951

Simple, overwhelming power, real or potential, was not to be found embodied in the supercharged Colombo V-12. While developments on the engine were satisfactory, with marginal improvements continually being made, nothing unique or drastic enough was found to immediately equate it with the Alfa Romeo, and then allow for further improvements to compensate for the Alfa's inevitable improvements. Ferrari decided on a different approach, and looked to the other half of the formula, engines of 4.5 litres unsupercharged. Though the engine would not, in the beginning, be conspicuously more powerful than the Alfa 159's, it would give an immediate tactical advantage in that it used only one gallon to cover six to eight miles, while the Alfa got only 1.5 to two miles on that same gallon. That one unneeded pitstop would absolve the losses due to lack of absolute speed.

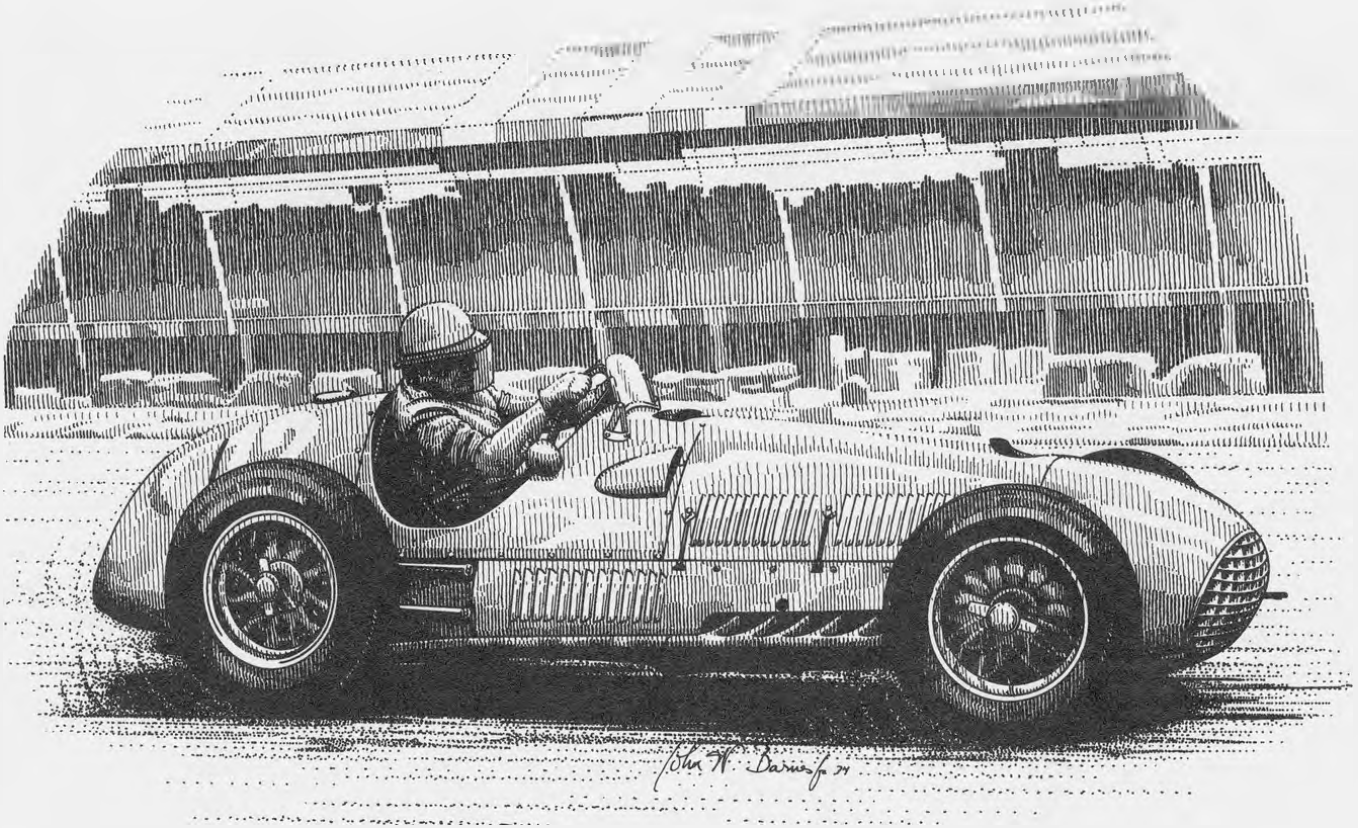
The primary architect of this new approach was the young engineer, Aurelio Lampredi, who had come to Ferrari in 1947 and worked under Colombo. So forceful were his arguments, that Ferrari allowed several test engines to be built, their success forcing Colombo out, leaving Lampredi in full charge. Lampredi's design was based on Colombo's, but now, of course, it was a larger 60 degree V-12. By 1951 when it was a full 4498 cc., it was developing 380 bhp at 7,500 rpm, with twin plugs, single overhead cams, and three Weber carburetors.

Then, as now, the chassis was only a modified version of the preceding ladder-type model. Strong, successful engines, seemingly built overnight, were the Ferrari factory's forte, the chassis was not. A certain design had only to be adequate, rather than brilliant, to remain in the stable. Externally, the 375 was at once both trimmer and larger than the ungainly-looking 125. Awkward design features were cleaned up, and the bulbous lower flanks were flared into the upper body panels giving a rounder, more substantial appearance, reminiscent of the brutish German giants of the late 30's.

All the interesting changes and developments in the car, though, were secondary to its actual historical importance. Ferrari did not design and build the 375 simply to be supreme in Grand Prix racing, but ultimately to beat his old employer, Alfa Romeo. They had been totally dominant for five years now, with Ferrari only winning when they were absent. The 1950 racing season for Ferrari was a primer. The 375 began the quest at Spa with a 3.3 litre engine, and finished an uninteresting but stable 5th in the hands of Ascari. With Serafini and a 4.5 engine, it gained a 2nd at Monza, and finally a 1st, again with Ascari, at the Penya Rhin Grand Prix.

In 1951, Lampredi increased the output of the 375 by adding a second plug per cylinder, while Colombo, now at Alfa Romeo, frantically sought increases for the aging and highly stressed 159's. Ferrari was first in the first three races of the year, Syracuse, Pau, and San Remo, but that was without Alfa's presence. Alfa won the next three, Bremgarten, Spa, and Rheims, with Ferrari second. The climax came at the British Grand Prix in July, when Froilan Gonzalez, hired only at the race before by Ferrari, won over the Alfa of Fangio in a classic race. Ferrari went on to win at Nurburgring, Pescara, and Monza, closing the season at his intended goal, being the complete equal of, if not superior to, Alfa Romeo.

Pages 16-17 Froilan Gonzalez slides the 375 through a turn at the British Grand Prix at Silverstone in 1951. He won the race, giving Ferrari his first victory over Alfa Romeo.



625-625A 1954-1955

With Alfa Romeo's definite, and as it turned out, final withdrawal from Grand Prix racing, Ferrari faced an immediate future of virtually no worthwhile competition. The Talbots, Maserati, and BRM's were either woefully underpowered, or despairingly unreliable. The organizers of races at the various tracks around Europe were quick to see this fact as well, and for 1952 and 1953 they formed their activities around the then-existing Formula II. For the series Ferrari developed a new, lighter car, typed the 500, with a remarkable 4-cylinder in-line engine of 2-litre capacity, designed by Lampredi. It was flexible, high-revving and reliable, and the car won virtually every race in those two years.

The 625, then, was very similar to the 500, but not a direct derivation, as it was designed concurrently with the Formula II car, simply kept in the wings until its appointed time in 1954 when the new Formula I era of 2.5 litre engines was to begin. Indeed the original 625 appeared as early as 1951 in the Bari Grand Prix where Piero Taruffi finished 3rd. Through 1952 and 1953, it turned up infrequently at the few Formula Libre races being run, winning most of them. As things turned out, it was rather unfortunate that the Formula II cars were so successful, as it kept the similar 625 from being improved upon. When the 1954 season was half over, the 625 was simply overwhelmed by the technical superiority and teutonic efficiency of the new Mercedes W196. Grand Prix racing was revolutionized with the introduction of this car, and the Ferrari and other teams could only struggle to keep up.

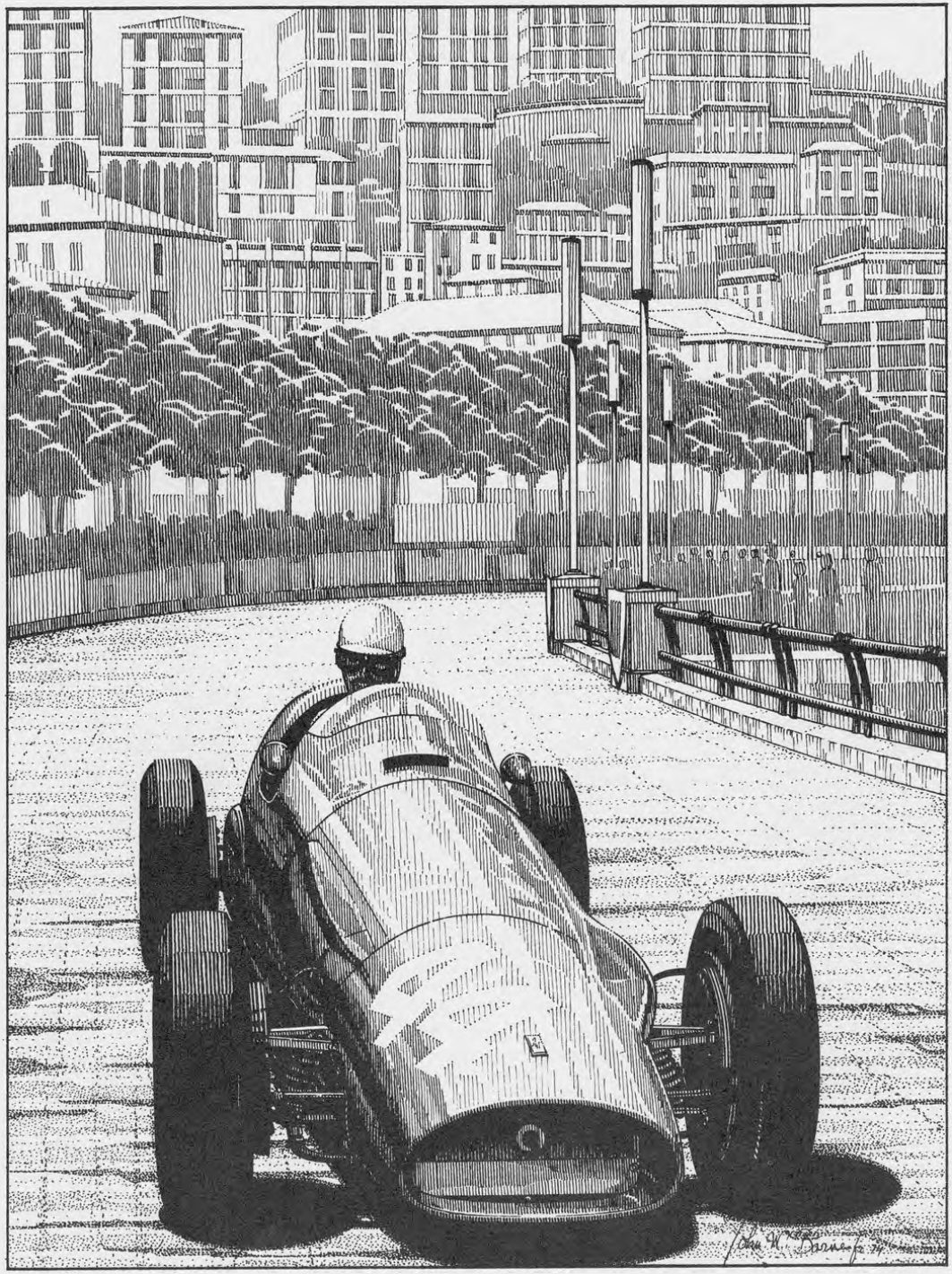
The 625, though, was an excellent example of a Formula I car of the old school. The ladder-type chassis supported an upper network of tubes and braces, a haphazard arrangement that somehow connected all the components together. Torsional rigidity was lacking, and this contributed to the unimpressive handling, although this was better than on either the 125 or 375. Front suspension was transverse leaf springs and wishbones; the rear was a de Dion tube. As before, huge drum brakes stopped the car. Because of the rather short in-line 4-cylinder engine, the external body shell was much more compact, with a very rakish, elongated nose. The car had an older more up-right appearance to it, although it was no taller than the earlier Ferrari. The engine inside, as stated, was a brilliantly compact and efficient little package, with two valves and two plugs per cylinder, twin overhead cams, 240 bhp and a capacity of 2,490 cc.

Ferrari engaged Gonzalez, Farina, and Mike Hawthorn to drive the cars (Maurice Trintignant had a private entry as well), and in the first part of the season, there was much satisfaction to be had as the Ferrari did well against strong Maserati opposition, winning at Buenos Aires, Syracuse, Bordeaux, Silverstone and Bari. All this soon ended when Mercedes appeared at Rheims with cars for Fangio and Kling. Mercedes won, and they continued winning at Nurburgring, Bremgarten, and Monza. The only race the 625 won over the Mercedes that year was at Silverstone, with Gonzalez driving, and this it could only do because of the very high revving 553 engine that it now had on board.

Even before the Mercedes did arrive, the 625 engine was suffering a distressing number of breakdowns. A derivative engine, the 553, orginally planned to power another new Ferrari model, was substituted in many 625's through the rest of the season. Once the Mercedes made their presence felt, even this engine began to be overtaxed in its efforts to keep the W196's in sight.

In 1955, the cars, now typed the 625A, were retained for racing because of the poor handling and reliability of the new model 555 Ferrari. The full 555 engine was kept, though, and connected to a new 5-speed gearbox. Efforts were made to increase the 625's speed by trimming the body, lowering the nose, and integrating the windscreen more fully into the body. Success was non-existent, the only win being Trintignant at Monaco after the Mercedes had dropped out.

Pages 18-19 — In a surprise victory, the underpowered 625A of Maurice Trintignant came through first at the end of the Monaco race of 1955 after the main opposition had broken.



553-555 Squalo 1954

In the victorious years of 1952 and 1953, when the factory faced the future with the most perfect equanimity, Ferrari began developing a new model to continue the success, in 1955, that was sure to be brought home by the 625 in 1954.

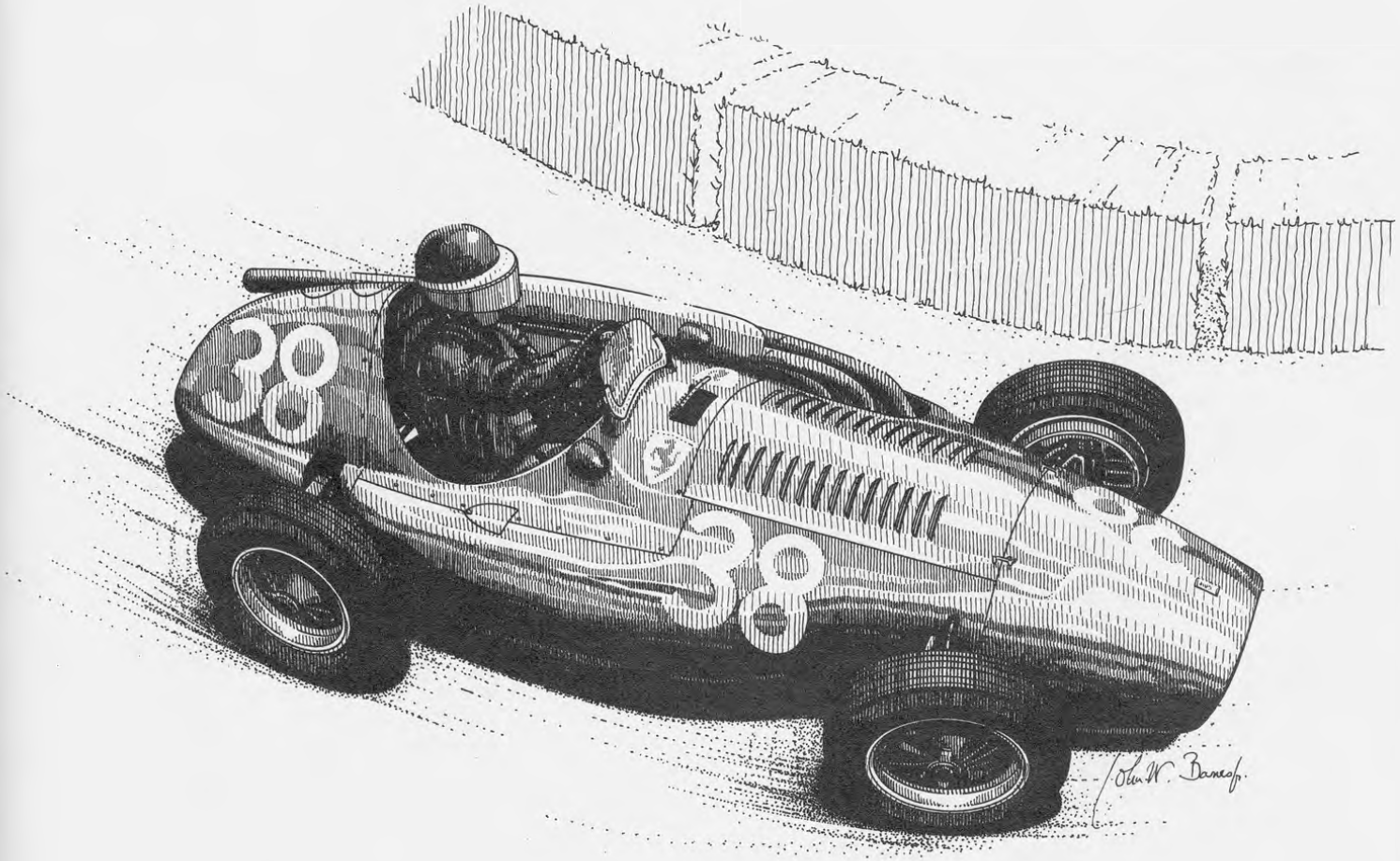
It was a very different car from the 625 in that the chassis was lower, wider, and incorporated a skeleton space-frame of well-placed multiple steel tubes. The fuel tanks that previously had been positioned in the tail behind the driver were placed alongside the cockpit in hopes of lowering the center of gravity, and thus improve handling. The pregnant flanks that these tanks engendered plus the lower body gave the car a shark-like appearance, hence the name of "Squalo."

The outer design had a certain "rightness" about it, all parts in a beautiful proportion that bespoke competence and aggression. The sweep of the hood was emphasized by two long rows of louvers, and the exhaust pipes now rose purposeful and businesslike out of the body over the left flank, past the cockpit to the tail.

The engine in this 553 was similar to the 625, but because of a shorter stroke, had a higher rev limit. The whole engine was re-cast to make it stronger, the valve angle was changed, and new specially-designed carburetors were used. At once more powerful and reliable, the engine not only serviced the new car through 1954 and 1955, but eventually the 625 as well.

The 553 was first shown at the Italian Grand Prix at Monza in a 2-litre form. Its first racing appearance came in 1954 at Syracuse, where it suffered a premature demise by being completely burnt in a crash. Through the season, other 553 models surfaced at various races, all succumbing to assorted ills. The only moment in the sun for the graceful 553 was a very convincing win in the hands of Mike Hawthorn at the Spanish Grand Prix, in late 1954.

Pages 20-21 — Beautiful as the Squalo was, it fared poorly in competition, winning only once at the Spanish G.P. in 1954 driven by Mike Hawthorn.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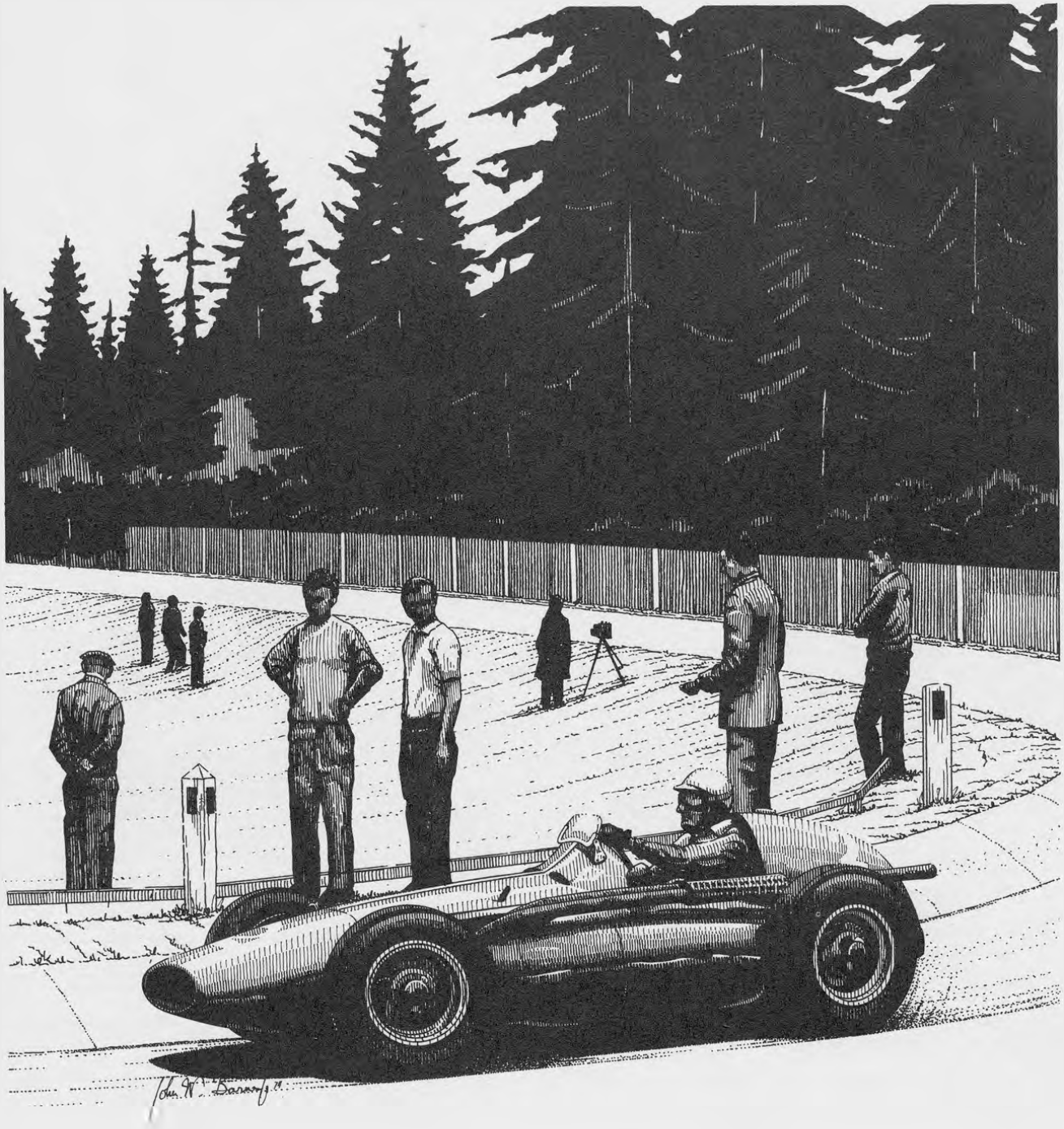
555 Super Squalo 1955

As the Mercedes domination rolled on into 1955, the Ferrari factory cast about for solutions to their very evident quandary. The 625A with the 555 engine was reliable, but no match in speed or stability. The 553 Squalo had great potential inherent in its design, but its handling was abysmal. A new attempt was made along the lines of the 553, but instead of attempting some sort of breakthrough, the changes were static, simply a realignment of elements already in the 553. The space-frame was re-mounted on the older set-up of two longitudinal large-diameter tubes running the length of the chassis. The engine was moved a bit forward, the side fuel tanks were moved a bit back, and the rear tank was enlarged. Coil springs were added to the double wishbones in front, with no changes in the rear suspension.

These internal re-arrangements necessitated a re-design of the outer shell, and it ruined the beautiful potent curves, the unmistakable flair of the 553 Squalo. The side swellings became simple bulges, the nose was elongated all out of proportion, and the new fairings around the cockpit added an abrupt note to what would have been an otherwise smooth side profile.

For drivers in 1955, Ferrari had the reliable Farina, plus Trintignant, Harry Schell, and Maglioli, but most chose the 625A to race as their new 555 "Super Squalo" was no better in handling than the 553. Mercedes, of course, had Fangio, but now they had the new and supreme talents of Stirling Moss. And as if Mercedes wasn't enough opposition, the Ferrari had to contend with the promising Maserati 250F, plus a now fast and reliable Lancia D.50 in the hands of Ascari, Villoresi, and Eugenio Castellotti. As it turned out, the most the Ferrari could do was run their own slow race behind the leaders, gaining better positions only as the faster cars broke. The Super Squalo never won a race, its best finishes being a 3rd at Spa with Farina driving, and a 3rd at Monza with Castellotti at the wheel. Toward the end of the season, the 625A and the 555 had absolutely no development life left, and things appeared bleak, to say the least.

Pages 22-23 Guiseppe Farina drove a smooth, clean race around the beautiful Spa circuit to finish in 3rd place, behind the all powerful Mercedes-Benz, in the Belgian G.P. of 1955.



Lancia/Ferrari 1956

In late 1955, there occurred a most extraordinary series of events in the racing world, the end result proving to be as important and beneficial to Ferrari as its timing was providential.

The racing team sponsored by the Lancia automobile firm of Turin was slowly coming apart from the inexorable pressures of the financial instability of the parent company, and the loss of its most valued driver. Its race car was a new and very advanced type designed under the long acknowledged brilliance of Vittorio Jano. Called the D.50, it was very sophisticated for a Grand Prix car, incorporating many features that were to become realized and valued only several years later. It was small, light, and supremely compact, the cavernous spaces in the engine compartment and cockpit of other Grand Prix cars being eliminated. In its own simplistic way, it was even more efficient than the W196.

All parts of the V-8 were cast for extra strength as the engine served as an intregal part of the upper structure of the space-frame. The chassis was so compact that the engine just fit, so it was very ingenious and yet logical to make the engine do double-duty. Tied together in this way the body was very rigid, chassis distortion was eliminated, and good handling qualities could be found by simply adjusting the suspension.

Along with good handling, the D.50 was extremely fast. That 90 degree V-8 engine had two valves and two plugs per cylinder, and twin overhead cams per bank which were rotated by double roller chains. The very considerable power went through a 5-speed gearbox and a ZF limited-slip differential.

The long, thin central body had no room for fuel, but this problem was solved by a very notable, and visually exciting, solution. The tanks were positioned, outrigger style, away from the body, between, and in direct line with, the front and rear tires on each side.

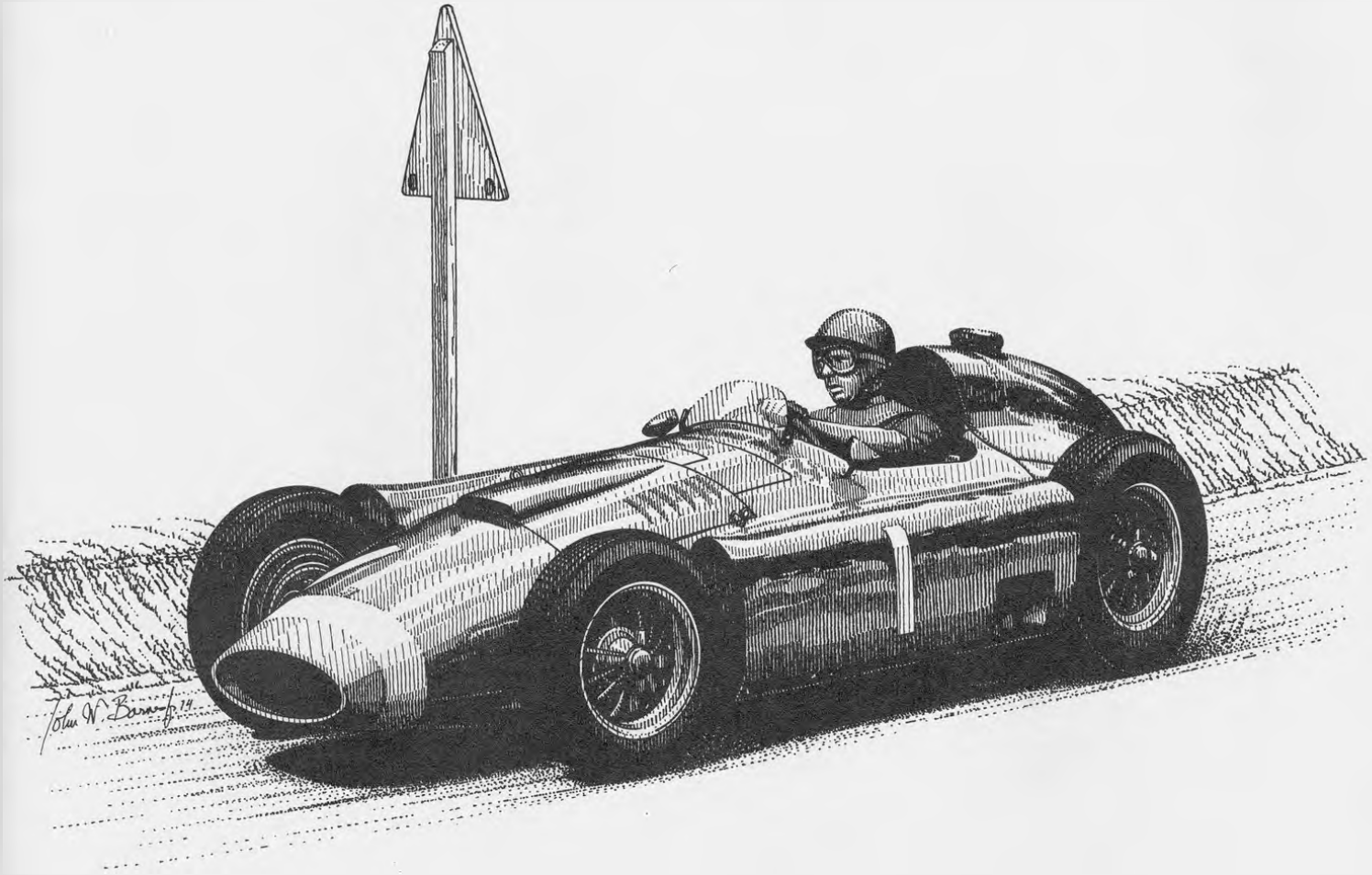
Introduced in 1954, the D.50 began serious racing in 1955 winning the Turin and Naples G.P. In other races, they were the equal of Mercedes in both speed and handling. All their efforts ended, though, when their lead driver, Alberto Ascari, died while testing a friend's Ferrari sports car at Monza. In July, all the cars, spares, equipment, mechanics, and the services of Jano and Massimino were given to Ferrari, and in one benevolent stroke all his racing problems were solved.

Some have suggested that in accepting these D.50's, Ferrari admitted the failure of his own cars, and while this might be partially true, it really displayed a very shrewd assessment on his part of his present and future state. To stay in racing, he would have to run the 625's and 555's in 1956, or start work on a whole new car. Here at his disposal now was an advanced, successful car on which he could build. His desire to race easily overcame any protestations of stubborn pride.

Ferrari began immediate work on the D.50's for 1956, and it proved something of an embarrassment when the less modified cars were faster. One major change on all cars was the removal of the bulk of the fuel from the side tanks to the tail, leaving the tanks hollow, carrying only the exhaust pipes. Why he did not simply remove the side tank is not known, but one can only be thankful that he didn't, for it was this one feature that made the car so popular with the public, then, and even now.

New support money from Fiat allowed Ferrari to hire Fangio, Castellotti, Luigi Musso, Peter Collins, de Portago, and Olivier Gendebien, and in the hands of these drivers, Ferrari won another championship, the Lancia/Ferrari winning every race but three.

Pages 24-25 — Fangio the master, calm and unruffled, in the only year he drove for Ferrari, here winning the Nurburgring race, among others, as well as the Drivers Championship for 1956.



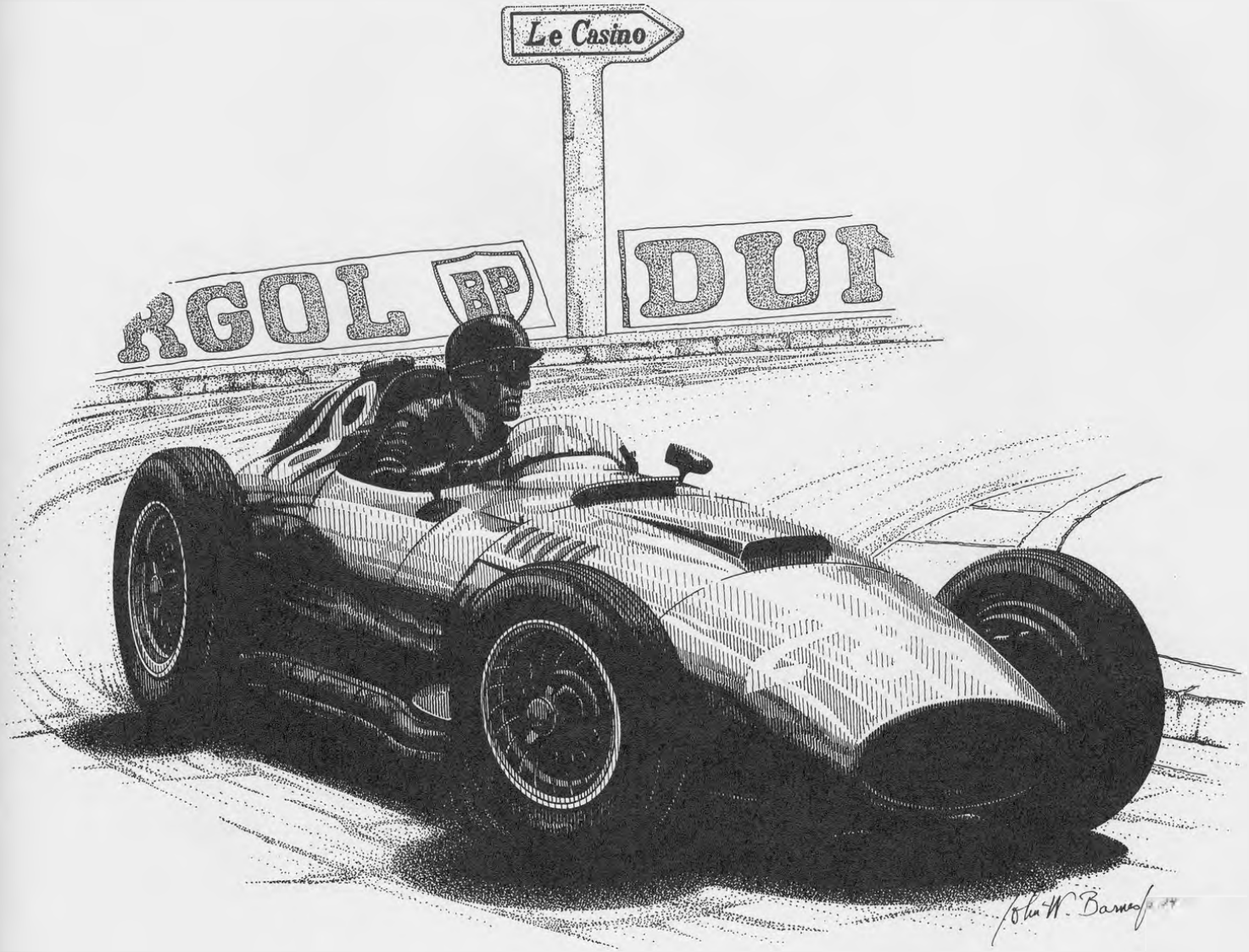
801 1957

The many modifications made to the D.50 during the 1956 race season continued on through the winter of 1956-57, with the result that the 1957 Ferrari, while loosely based on the old Lancia, was no longer really a Lancia at all. A new chassis was built, slim and compact, that carried the engine as a semi-stressed member. Unequal length wishbones and coil springs were in the front with the usual de Dion setup in the rear. The engine was new, the work of Bellentani and Bazzi, and while it retained the lightness and strength of the Lancia V-8, it was brought more into line with standard Ferrari engine practices by changes mainly in valve actuation and in the crankcase.

These new cars proved to be no faster than the 1956 cars, but they were retained, with subtle changes made throughout the season. Early in the year they unaccountably wore the old 1956 side tank bodywork, but this was generally gone by Monaco, replaced by a slim and quite elegant body. The four exhaust pipes per side especially, curling up from out of the lower body, added a forceful touch.

For the race season, Ferrari had a stellar line-up of present and future Grand Prix champions, but none could overcome the dominant team of Fangio and the Maserati 250F. Through the year the Ferrari drivers, Peter Collins, Hawthorn, Castellotti, Musso, Wolfgang von Trips, de Portago, Perdisa, Phil Hill and Trintignant, tried at various times to stay with Fangio in their 801's, but the combination was too strong and the 801's too weak. Collins won at Syracuse and Naples, Musso won at Rheims, and the short life of the 801, and the two-year era of the Lancia/Ferrari, was over.

Pages 26-27 — Clean and elegant as it was, this 801 with Peter Collins driving never raced at Monaco, as it crashed on the next practice lap.


Le Casino
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John W. Barnes

246 Dino 1958

Even as Ferrari played with the D.50 Lancia and its derivatives, he was ever-looking to the future. While the present formula of 2.5 litres would run to 1960, an interesting and controversial rule was to come into effect in 1958, whereby all cars had to run on petrol fuel, and no longer on the exotic and highly volatile combination of benzole, nitromethane, acetone, and castor oil mixed in alcohol base. Having received Jano's services from Lancia, Ferrari commissioned him to design a new engine that would be suitable for petrol combustion. At the Naples G.P. of 1957, this engine appeared in 1.5-litre form in an equally new Formula II chassis.

Throughout 1957, it ran mostly in practice at the Formula I races, gaining both speed and reliability as the engine displacement was gradually increased to 1.8 litres, then 2.2, and finally 2.4 litres.

As 1958 began, the final form of this now Formula I car and engine arrived. Angled at 65 degrees, the two banks of three cylinders sat offset from each other, the left bank staggered ahead of the right. There were two valves and two plugs per cylinder, two cams per bank, three Weber carburetors in the V, and the oil, water, and fuel pumps were driven off the front of the short rigid crankshaft. Efficient and high-revving, this engine in many variations was to bring as much glory to Ferrari over a six-year period as did any of his V-12's. His son Dino was the prime mover in getting the engine built, so in his honor, it became typified as the V-6 Dino engine. The power was transmitted through a 4-speed gearbox to a ZF limited-slip differential.

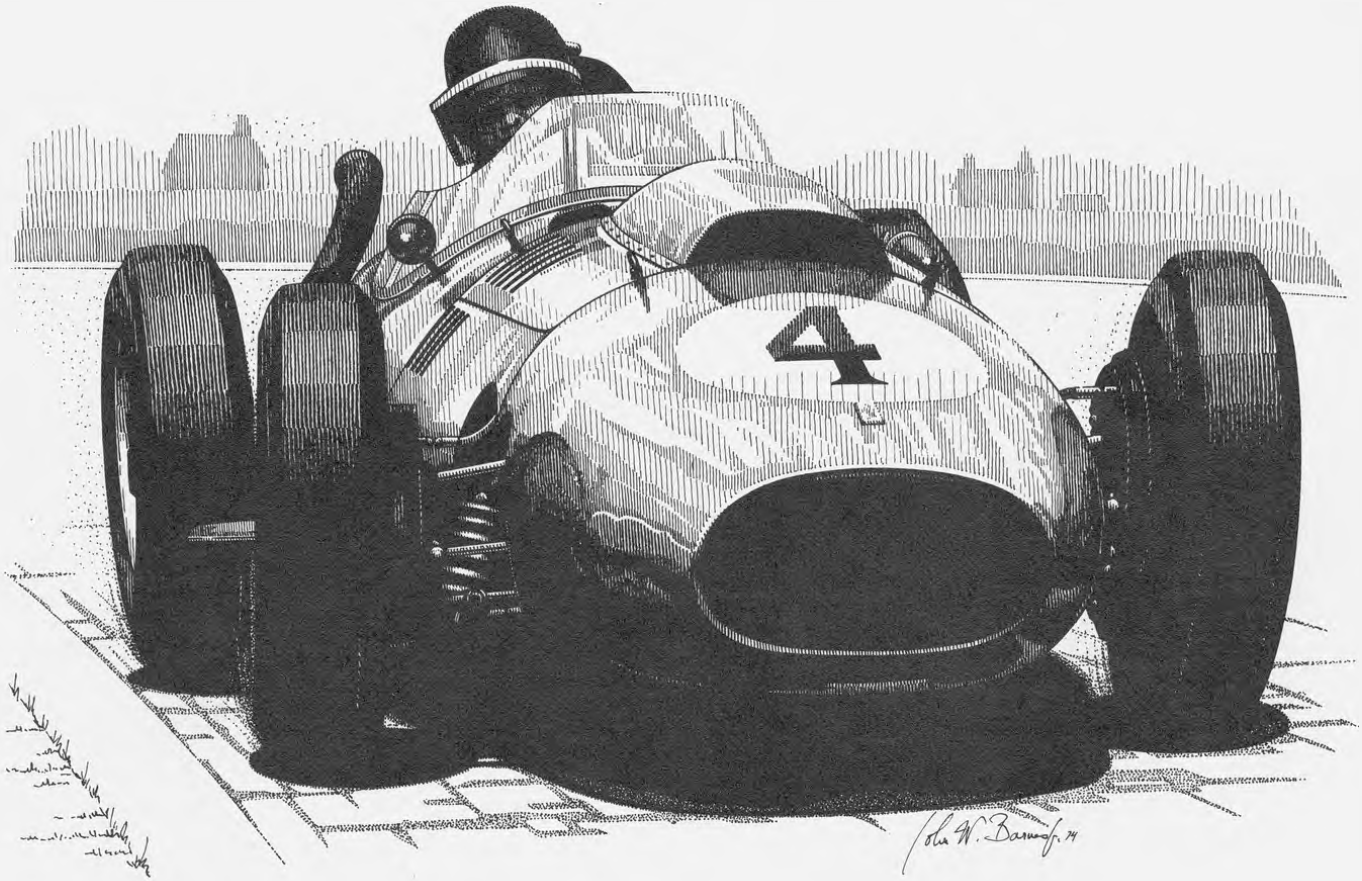
The chassis holding this power train was based, not in design but in theory, on the semi-space frame of the 553 Squalo. The upper superstructure not only held the body panels, but acted as an integral part of the chassis, providing greater stiffness. Overall, the external body was a bit ungainly, but surprisingly pleasing in its own uncut, brutish way. The low nose rose to be met by an overly large intake for the carburetors. A deep reverse curve wound its way below and past the cockpit before trailing off behind the headrest. The windscreen attachment looked like an afterthought, as did the exhaust pipes, which were strung along the sides of the cars, curving abruptly over the rear suspension.

Driven through the year by Collins, Hawthorn, Musso, von Trips, Gendebien, and Phil Hill, the 246 Dino did very well, winning at Goodwood, Syracuse, Silverstone, and Rheims. It was not enough to win the Constructors' title for Ferrari, which went to the now fast and reliable Vanwalls. In an odd reversal, though, Hawthorn, by virtue of several 2nd place finishes, in addition to his one championship victory, won the Driver title for that year.

All of the Ferrari's good years seemed to be marred in one form or another, and this year Musso died in a crash at Rheims, the popular Collins died at the Nurburgring, and the disheartened Hawthorn retired, only to die that winter in a private road accident.

Beginning with this year, Ferrari initiated a new identification system for his Grand Prix cars, based on the engine capacity and the number of cylinders. Thus, the 246 became what it was by having a 2.4 litre engine with 6 cylinders.

Pages 28-29 — Brutish and almost uncontrollable as it slides through a turn, Mike Hawthorn held on long enough to win the French Grand Prix of 1958.


4
John W. Barnes Jr. 74

246-256 Dino 1959

Other Ferrari (and other Grand Prix cars) will be liked for their smoothness, and still others will be endearing for their ugliness, but few will disagree that the 246-256 Dino of 1959 is one of the most beautiful and thoroughly aggressive F1 cars ever built. Looking every inch as only a Grand Prix car should look, it was a very fortunate combination of practical necessities and current aerodynamic thinking. The responsibility belongs to Fantuzzi, a new body-builder for Ferrari, coming from Maserati where he had designed the body of the beautiful and successful 250F. The gawkish, busy look of the 1958 246 was replaced by a body that was a deceptively simple design, just a long tapered cylinder, but with enough touches, just enough cuts, scoops, and ancillary curves at just the right places to give the car an unmistakable air of quiet and refined arrogance. That long, smooth curve of the hood was broken at regular intervals by the front scoop, then the carburetor intake, the windscreen and cockpit and finally the head rest, giving credence to an old theory of aesthetics postulating that beauty is the multiple repetition of certain elements in an overall smooth surface. The flanks were covered by a variety of well-placed airscoops, mud guards, and latches, neatly underlined at the bottom by the exhaust pipes. The final touch was three gill-shaped air vents on the lower body; the nomer of "Squalo" or shark would have been more applicable here than on the 555 of 1955.

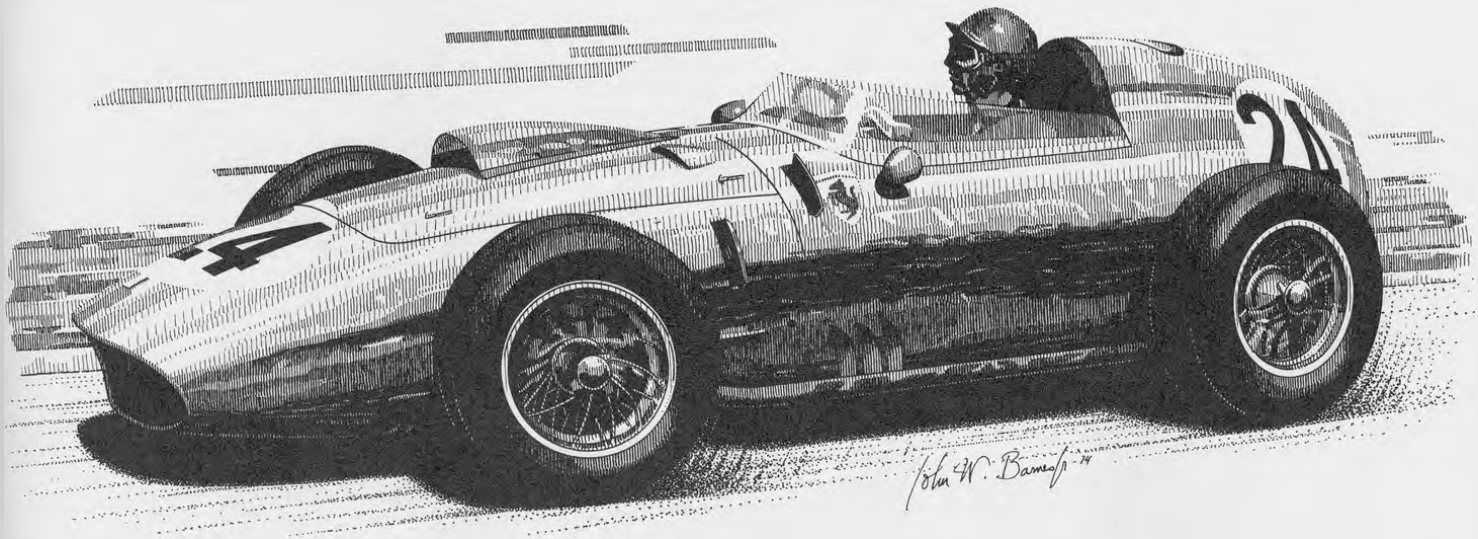
Internally, the car was little changed from the previous year, primarily because there was no real need. The 246 V-6 Dino engine of 2417 cc. was strong, reliable, and faster than all other competitors. Its capacity was increased later to 2451 cc. and 2474 cc., becoming in effect a 256 engine under Ferrari's new identification system. (There is no concise agreement on when each engine actually raced, hence the "246-256" tag on this car.) A new 5-speed gearbox, new coil spring rear suspension, and Dunlop disc brakes and tires corrected other nagging faults.

This car, by all the rules, was unbeatable, but beaten it was, and at an ever-increasing rate. The rules were changing, and the big Ferrari was being forced into racing of a very different type. It was not that the competition was too strong, but that its very nature had changed. The rear-engined Cooper of 1958 was regarded as an interesting lost cause, but the Cooper-Climax of 1959 was reliable, flat and stable through the turns, and becoming, with a full 2.5 litre engine, every bit as fast as the Ferrari.

Three wins were gotten that year by the 246-256, at Aintree by Behra, and at the fast circuits of Rheims and Avus by Brooks. A young Phil Hill, Cliff Allison, Olivier Gendebien, and a very new Dan Gurney added several 2nd through 6th place finishes. On the slow, twisty courses, such as Monaco, all were easily beaten, no matter what desperate and definitely courageous maneuvers were performed to get the cars through the turns faster.

Brabham won the championship in a Cooper, as the Ferrari were being pushed further and further beyond their design limitations. The 246-256 acquitted itself well that year, though, and it will always be remembered as the last of the big, raucous, front-engined, single-seat racing cars. This was all the more apparent when placed amongst all the new competition, which no matter how innovative and ingenious, still looked definitely puny. The 246-256 of 1959 was the Grand Dame amongst the debutantes.

Pages 30-31 Tony Brooks in the 246-256 on his way to a first place in the European Grand Prix at Rheims, France, 1959.


24
John W. Barnes '74

256 Dino 1960

The 256 Dino that ran in 1960 truly represented the end of an era.

No longer would a man be able to sympathize so completely with a car, and believe in his dreamings that, given the chance, he too could pursue a mundane occupation during the week, then leave for Silverstone over the weekend, or across the channel to Rheims, to put on helmet and gloves, step into one of the team cars, drive the race, and finish, no, not first, that dream would be adolescent, but high up, third or fourth, close to the truly greats, to Moss, Fangio, or Hawthorn, giving a good accounting of oneself before heading back to work on Monday. The cars were big and slow enough then, able to be slid through corners and pushed down the straights with much noise and fanfare, and thus could figure warmly in our reveries.

Very soon the cars would be beyond our comprehending, too detailed and precise, much smaller and more fragile. Their overall design would be shaped by colder, known aerodynamic facts, and not by that previous delightful blend of theory and the sculptor's art, unscientific to be sure, but beautiful. Speeds would increase several seconds per year to a point where the driver, out of absolute necessity would become a complete professional, wrapped in an envelope of Nomex for his protection. To skill and experience will be added new requirements, youth and incredibly quick reflexes. These men and cars we can definitely admire, but no longer feel close to.

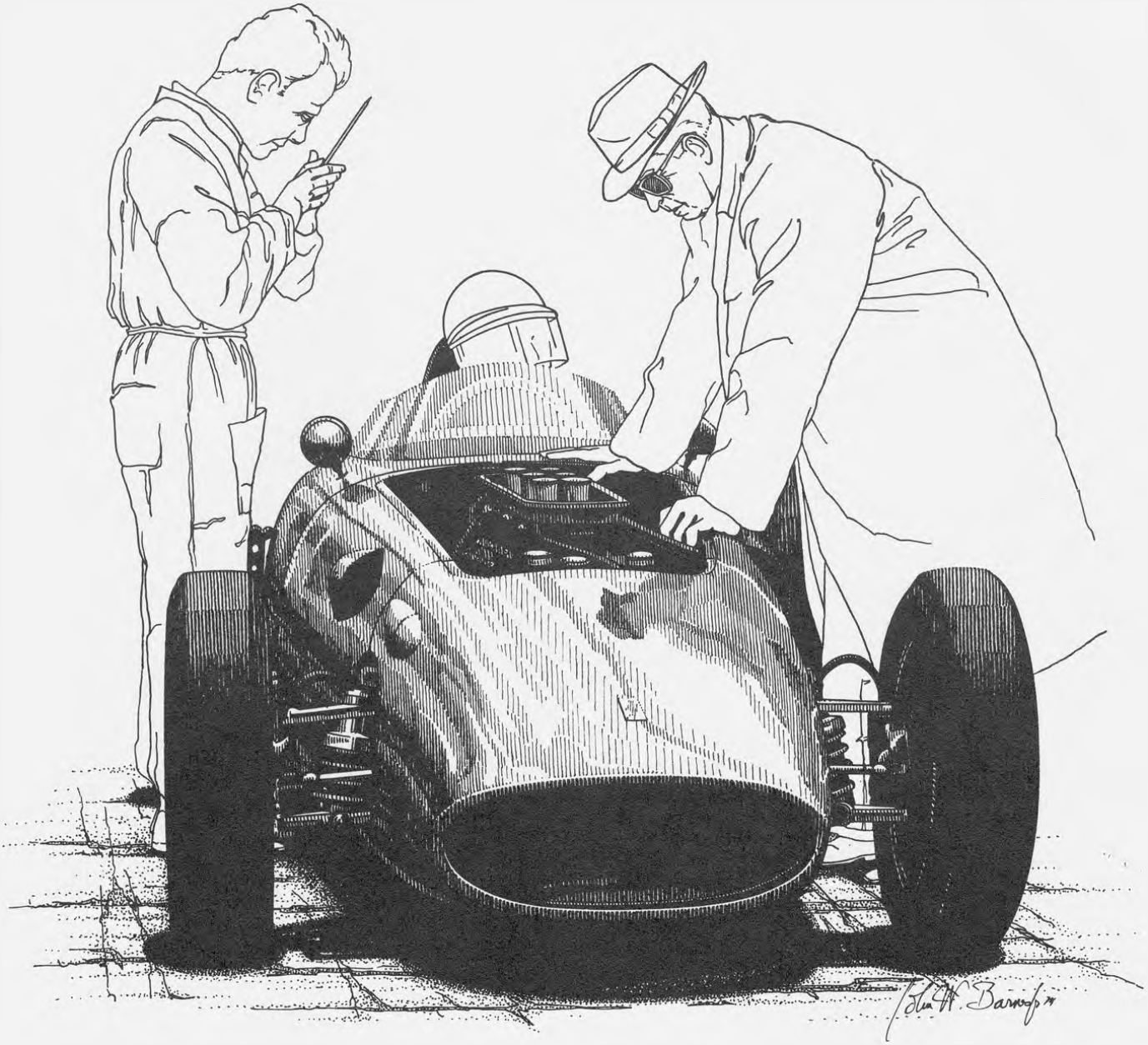
As Ferrari worked on one of these new-type cars to be ready for the new 1.5 litre formula of 1961, the 256 was compelled to run the championship events of 1960. Understandably it did poorly. While very strong and fast, it could no longer keep with the Coopers through the turns, no matter what modifications were made to the suspension. The car was also made lighter, the body shape was pared and refined, but such devisings were not enough.

Phil Hill and Wolfgang von Trips, with Allison in a third car, drove the cars as best as one might expect, moving swiftly and quickly down the straights, but having great trouble in the turns, their faces showing either painful effort as they wrestled the car around, or surprise as the rear end broke loose. In every race of that season, save one, the cars did very poorly.

Everyone, from the factory, to the drivers, to the more knowledgeable onlookers, knew that the end was here. The lightness, the quickness, the right weight distribution needed for future Grand Prix racing were no longer to be found in a front-engined car, no matter how much or minutely the elements were adjusted.

Fortunately, the 256 did not retire as an object unregarded and forgotten. At the Italian G.P. at Monza, where the fans are the most exuberant, and where Ferrari makes his finest effort to impress that crowd and to draw on all that fierce loyalty in the Italian soul, the 256 Dino won its last race. Even though the British constructors for various reasons boycotted the race, and though Phil Hill in the winning car had little opposition, the honor was in no way cheapened. The 256 finished in the winners' circle, and no one was displeased.

Pages 32-33 Ferrari himself played with the 256 at Monza practice in 1960 in an effort to find more speed in the aging Dino.



156 prototype 1960-1961

Although Ferrari has been accused of being slow and sometimes even defiant in his acceptance of the automotive advances devised by others, such was really not the case in his seemingly protracted change-over from front-engined to rear-engined race cars. Although he was heard to mumble that an engine should pull a car and not push it, he had a rear engine chassis being built as early as late 1959, only a year and a half after the rear-engined Coopers arrived in Grand Prix racing. It appeared at Monaco in 1960 with a 2.5 litre engine and finished 6th, but was quickly discarded in this form as all efforts went into a new, rear-engined car to hold the 1.5 litre engines required for the new formula in 1961. This is regarded as the true prototype of all ensuing rear-engined Ferrari.

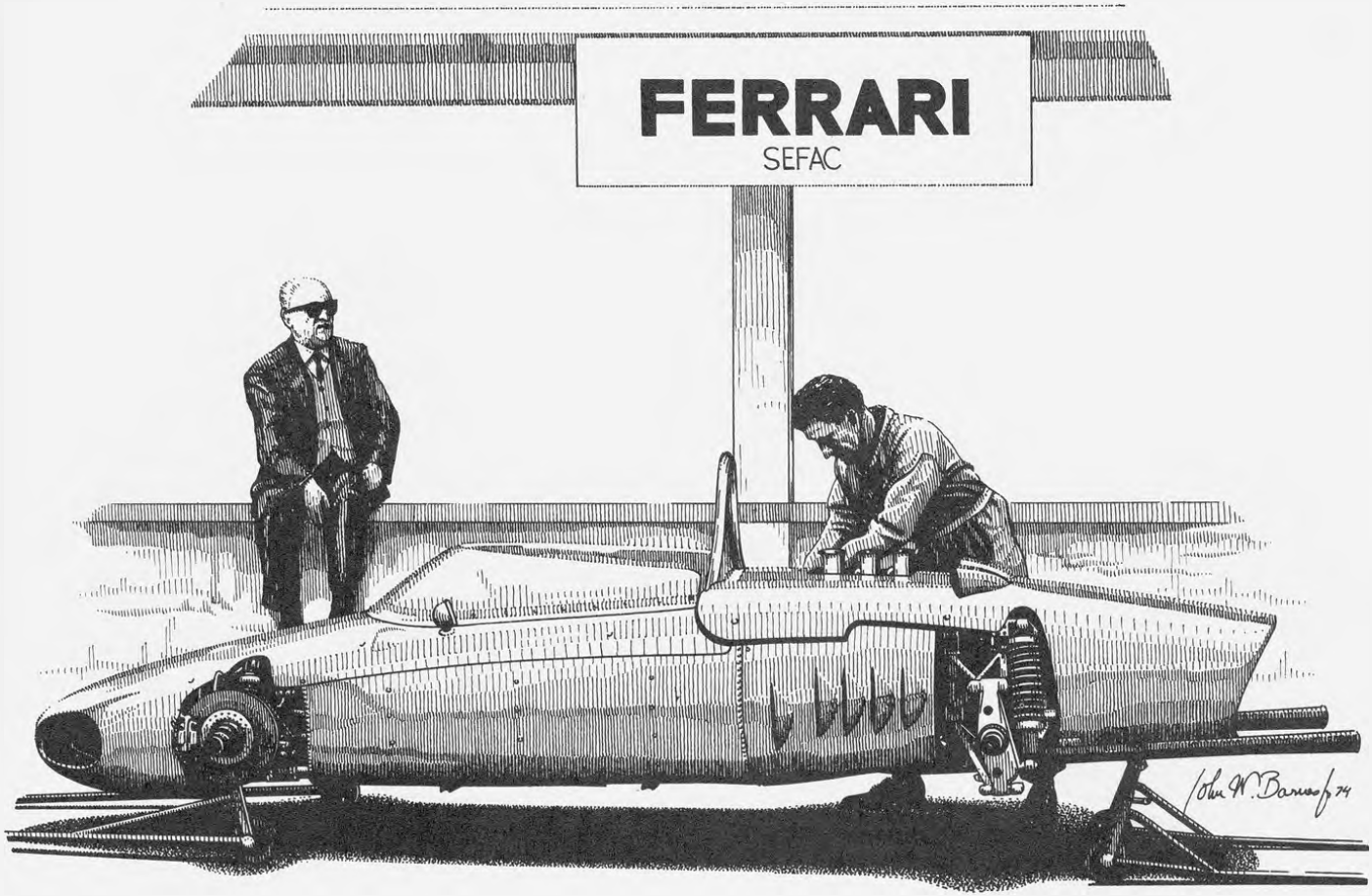
Copied from a Cooper that Ferrari borrowed from the Cooper-Maserati team, the chassis was a full space-frame of fairly large-diameter tubes. The driver was in a very recumbent position compared to the older cars, with the engine directly behind him, very low down in the frame. The final-drive unit was incorporated with the 5-speed gearbox, with the clutch lying at the extreme rear. Suspension was double wishbone, with coil springs front and rear, and disc brakes were now used all around, but inboard at the rear.

Externally, the 156 prototype was an object of extreme and subtle beauty with smooth flowing lines relieved by deft, precise touches. That low pointed nose with split air intakes was a brilliant piece of design by Fantuzzi, and it presumably provided better air penetration as well. Aside from the roll bar, there was not an ugly or graceless line or angle on the whole car. Few Grand Prix cars have been conceived so integral and complete in their design.

Powering this elegant machine was the V-6 Dino engine. Very similar to the 2.5 litre Jano design of previous years, it was the scaled-down version used in the earlier Formula II cars.

In 1960 the 156 prototype was entered in several of the Formula II races, winning easily at Syracuse and Solitude, and finishing first in the FII section of the Italian Grand Prix. This prototype went on to win its first Formula I race, also the first race in 1961, under the new 1.5 litre rules. A young and new Giancarlo Baghetti simply lost the opposition. Three weeks later, he and the car won again at the Naples G.P. Thus, the 1961 season began well for Ferrari, and with the other 156's that were built similar to the prototype, it continued onward to end in an overwhelming triumph.

Pages 34-35 Ferrari supervised the testing of his first and most beautiful rear-engined car, the 156 prototype, here seen at Modena.


FERRARI
SEFAC

156 1961-1962

There has never been for Ferrari a car so successful and a year so satisfying in Formula I as the 156 in 1961. The season was an absolute romp, and to say that it was so because the opposition was not ready is a rather serious oversight of the fact that Ferrari *was* ready.

Under the supervision of Carlo Chiti, the new prototype and other 156's were built, and it was he who made the subtle changes to Jano's already sufficient V-6 engine that suited it to the new 1.5 litre formula. A shorter stroke was inserted, allowing for higher revs with less piston speed. The 65 degree V-6 configuration was retained, as were the two overhead cams per bank, the chain drive, the twin ignition, and the three Weber carburetors.

Chiti also developed his own version of this engine that would fit more precisely in the low chassis of the 156. The two banks of three cylinders were opened to an angle of 120 degrees, thus gaining a lower profile externally, and receiving less vibrational stress internally. For whatever reason the left hand bank was now staggered ahead of the right, and not the reverse, as on the 65 degree unit. Other minor changes were made, mostly to simply strengthen an already good design. This 120 degree engine developed a bit more power (190 bhp) than the 65 degree unit (180 bhp), but both were immensely more powerful than anything else running that year.

Again, it cannot be overemphasized how much this year for Ferrari was an exercise in mechanical overkill. The 156's not only won every race but two, they also usually showed up in 2nd, 3rd, and 4th place as well, all in the same race. Their only defeats, at Monaco and at the Nurburgring, were the result of Stirling Moss' incredible driving in an new but underpowered Lotus. The only tragic note in an otherwise glorious year was the death of von Trips at Monza; Phil Hill finished the race and became World Champion.

For 1962, the 156's were little changed, and as in the past, where minor development was done on a successful car, that car became quickly unsuccessful as the other teams caught up. In this case, all the British teams now had their new 1.5 litre engines running reliably, and this, coupled with their already lighter and smaller chassis, made them superior. Another factor contributed to the lack of improvements on the 156, and this was a huge and all-encompassing embroglio (even by Italian standards), that resulted in virtually all of Ferrari's top assistants leaving the firm. No one had found the exact cause, and while arguments and tantrums were a regular and not altogether serious component of daily life at the factory, this one was serious, vituperative and final. Chiti was gone, as was team manager Tavoni, and the 156's suffered as Ferrari spent much time rebuilding his organization. The only wins came at three non-championship races where the competition was slight.

Such a poor season did little, though, to distract from the overall beauty of the 156, still one of the most exciting and engaging of all Grand Prix designs.

Pages 36-37 The 156 was supreme in 1961. Phil Hill is photographed as he wins the Belgian G.P., one of many he won on his way to the Drivers Championship.

156B 1963

1963 for Ferrari in racing was again a matter of simply getting through the season until a new and much more competitive design was ready. He was working on a V-8 and a flat-12, but until their arrival, he made do with the 120 degree V-6 of Chiti, and the now old 156.

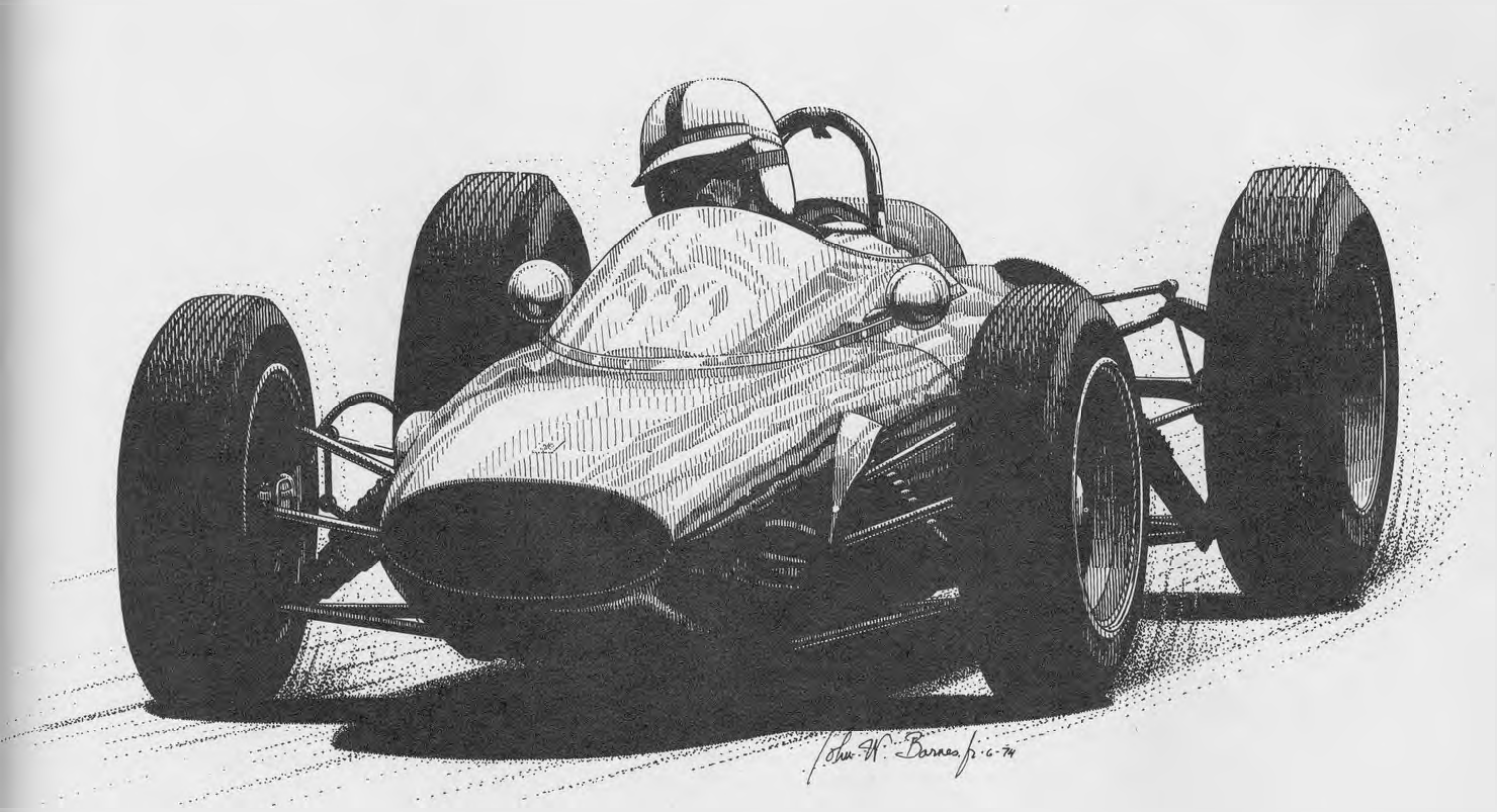
Now typed the 156B, the frame was lighter and even more compact in imitation of the spritely British cars. The body was trimmed, the tail was raised, the sculptured nose was chopped to an ordinary intake, and it can be said of this car, as it can be said of no other Ferrari, that it was a supremely dull-looking car, even duller and more non-descript in outward appearance than the British cars, if that was possible. The drive for smallness negated against all the wonderful body shapes and attendant appendages that had made Grand Prix cars so distinctive. Even the wire wheels were gone, replaced by cast-alloy ones.

Changes in the engine were much more interesting, however, and a great deal of life was found in the V-6, mainly in the 120 degree form. Bosch high pressure fuel injection was the main addition, and the power was now 200 bhp.

Ferrari at this time did away with his old haphazard method of hiring drivers, and signed several on a contract basis that required their services for testing as well as racing. The capable engineer Michael Parkes, the sometimes erratic but fast Willy Mairesse, and the extremely fast John Surtees were hired on this basis.

In the racing year, Jim Clark and the new stressed-skin Lotus 25 were not to be stopped, and what with breakages, the Ferrari were nowhere near the top. They were quick, however, and at the Nurburgring, Surtees won his first Grand Prix. The team was starting to regain its former cohesiveness, and for the year ahead, there was the superb driving of Surtees.

Pages 38-39 — Only one victory was enjoyed by the 156 B, the one graceless Grand Prix car ever built by Ferrari; John Surtees at the Nurburgring in 1963.


John W. Barnes Jr. 6-74

158 1964-1965

To ever be competitive again, Ferrari had to give serious attention now to his chassis. No more power was to be gotten out of the V-6, and the new V-8 would have little chance of even marginal success, unless carried in a new and better package. Impressed, no doubt, by Jim Clark's run of seven championship wins in 1963 in the monocoque Lotus 25, Ferrari had the ever-brilliant Vittorio Jano, and Franco Rocchi (along with the newly hired Mauro Forghieri), begin furious work on a new car, and it appeared at Monza in 1963. As usual with these overnight wonders, the new car was immediately competitive. If Ferrari does copy the chassis designs of others, he does it well, deducing and using all the important elements, and discarding the superfluities.

Two sheet-metal D-shaped fuel enclosing boxes were the sides, held together by floor and top body panels, plus bulkheads. In this particular prototype, the engine was bolted to the chassis behind the driver, thus becoming a stressed part of that chassis. In the actual 1964 car, the V-8 engine was not a stressed member and rested on a subframe that ran to the rear suspension.

Monocoque construction being a new science at the time for everyone, all attention was given to making the bodies solid and reliable, and aerodynamics were still thought of in terms of a simple minimizing of frontal area. Consequently all the cars of this period are decidedly dull in appearance, cigar-shaped cylinders attached to four spindly tires. The 158 Ferrari was at least a bit more refined and polished looking than the rest.

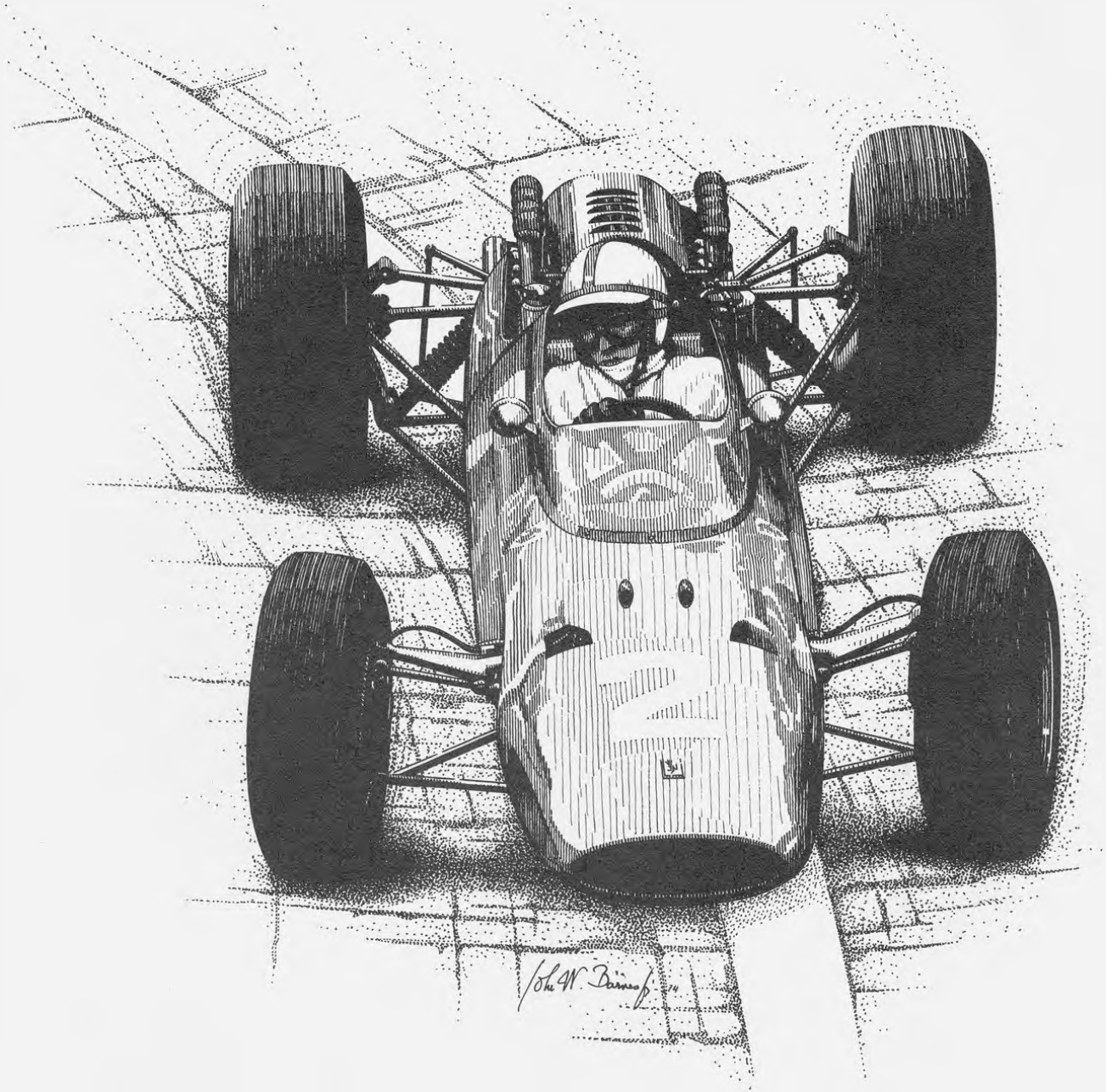
The engine itself, though, was, as usual, a perfect jewel, visually stunning in all its finely-cut and machined angularity. Angled at 90 degrees, the two banks of four-cylinders had twin overhead cams and Bosch fuel injection. Capacity was 1487 cc., with bhp being 210 at 12,000 rpm. A 6-speed gearbox allowed for full and precise use of all available power at any given engine speed.

As stated, the new car was an immediate success. All Ferrari championships, 1956, 1958, 1961, and now 1964, were won with such brand new cars, each conceived as a complete and total entity, needing little or no development. John Surtees proved to be as fast on four wheels as on two, and won the Syracuse, German, and Italian Grand Prix. Several 2nd and 3rd places added to this gave him the championship by one point over Jim Clark.

An interesting development in tires began that year that was to affect Ferrari and all other Grand Prix constructors. Chassis design and engine power had reached a plateau, so a logical area for improvements was opened up by Dunlop with its new wider tires. The increased acceleration, and stability through corners, resulting from better adhesion was immediate, and a great deal of work began on adjusting the suspensions to make full use of these new tires.

For 1965, the same car and V-8 engine was raced by Surtees and Bandini with very few changes, with the ensuing less successful results. Clark in the Lotus 33 was totally dominant, Surtees managing a reliable but ultimately uncompetitive string of 2nd's and 3rd's.

Pages 40-41 — Rounding a corner at the 1965 Grand Prix de l'A.C.F. at Clermont-Ferrand in France, 1964 World Champion John Surtees drove the 158 V-8 to a final 3rd place.



1512 1965

Ferrari's strategy for the 1965 racing season was based on his own knowledge and confidence that he could design, build, and maintain not just one, but two different racing engines. For the short, twisting circuits such as Monaco, the team would depend on the proven V-8; for fast smooth tracks like Spa, there would be a brand new flat-12. Ferrari's ability to churn out new, complete engines, not experiments, or hopeful eccentricities, or poorly conceived failures, but fresh, competitive engines, continued to astonish everyone. In 1965, now, he was going to campaign two cars, not with similar engines, or with one engine the development of the other, but two totally separate engines, both in concept and configuration, as though a variety of engines was of no more importance or interest than a variety of ratios for the gearbox.

This new flat-12 was a masterly example of planned miniaturization, as it had to fit in the existing 158 monocoque chassis. The two opposed banks of six cylinders had twin overhead cams per bank, twin ignition, Lucas fuel injection, and a capacity of 1489 cc. Light alloys were used extensively.

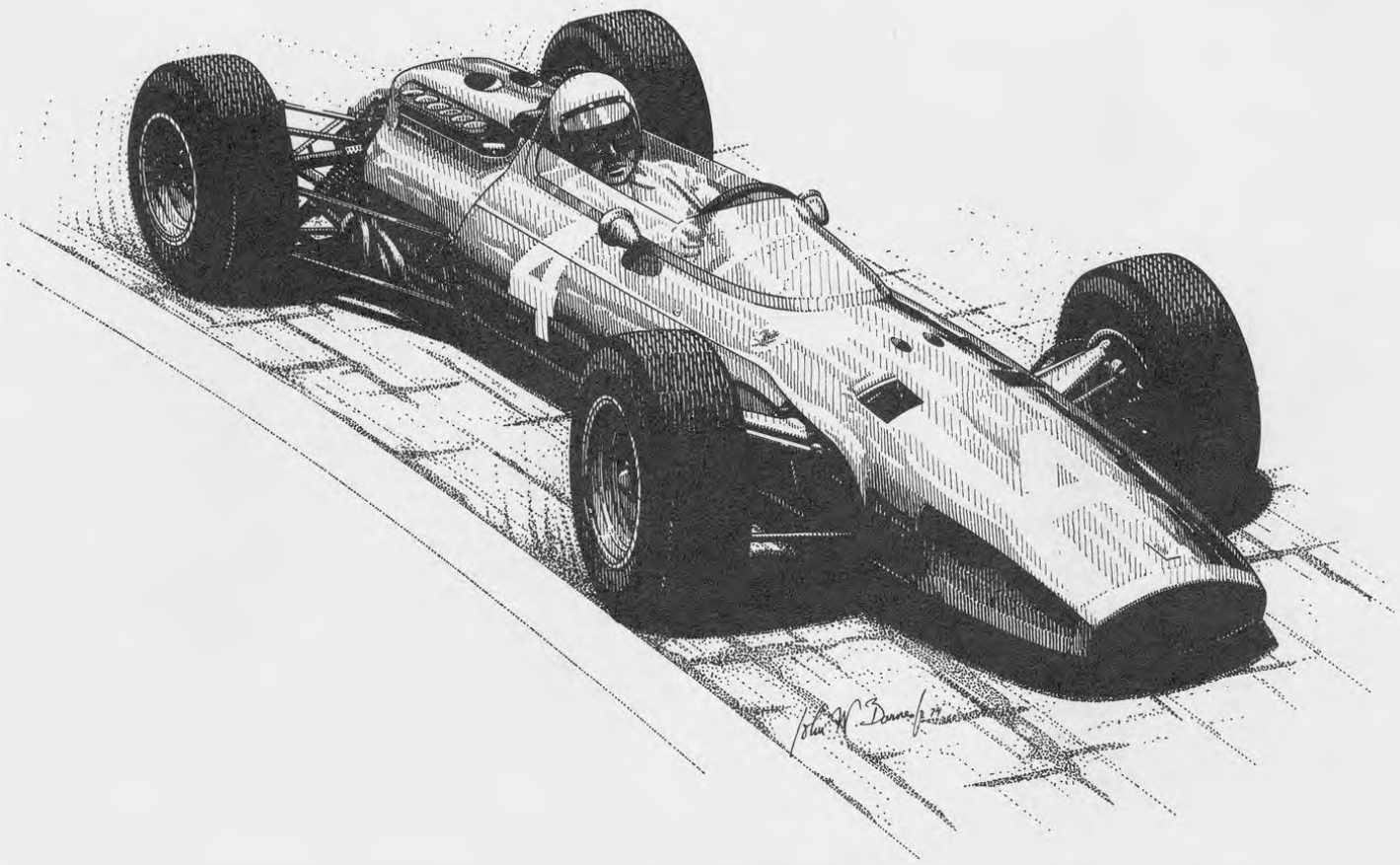
The new engine appeared at the Monza G.P. of 1964 and raced sporadically in the U.S. and Mexican G.P.'s. In 1965, it campaigned the whole year alongside the V-8's, as the torque characteristics of both became nearly equal, obviating the need to be selective about which track to race which on. Indeed, the flat-12 soon became faster than the V-8 on any course.

Much has been made of the fact that team manager Dragoni assigned the slower V-8 to Surtees, and the more powerful flat-12 to Lorenzo Bandini. While fast, Bandini did not have the experience of Surtees, and Surtees was one of the few at the time who could keep up with Jim Clark. To keep giving Surtees the slower car was a move that no doubt cost Ferrari another championship. Surtees did drive the flat-12 later in the season in a few races, but by then Clark had won the championship. In the hands of Bandini, the flat-12 proved reliable, usually finishing anywhere from 2nd to 15th place.

As mentioned, the V-8 and flat-12 rode in the same type 158 monocoque chassis. They are easily distinguishable, however, primarily by the chiselled cut in the sides of the nose. The V-8 cars had theirs set back a bit from the front, while the flat-12's had theirs beginning directly at the airscoop, the front loops of the chisel being cut off by that airscoop. At the rear, the two sets of four intake stacks of the V-8 are set widely apart, while the two sets of six on the flat-12 are quite close together.

The flat-12, especially, had a great deal of unexploited potential, and it is sad that the new 3-litre formula of 1966 cut its life short.

Pages 42-43 Similar in most respects to the 158, the 1512 is here driven by Lorenzo Bandini in the 1965 French G.P. The cut out near the nose denotes its flat-12 powerplant.



312 1966

A new 3-litre formula for Grand Prix cars came into effect in 1966, and contrary to all knowledgeable and dire predictions, no uncontrollable monsters of 500 bhp were produced, requiring 4-wheel drive and other novelties to keep them on the road. In fact, at the beginning of the season, there were very few 3-litre cars produced at all, most constructors being slow in changing from the old 1.5 litre formula. Ferrari was ready, again full of surprises. One would have thought that a larger engine was being built for the formula, with all the proven elements simply being extruded from either the V-8 or flat-12, whichever had proved the most successful. The amazement was genuine when the 1966 car appeared with a totally new engine, the 3-litre V-12 of Rocchi.

Another gem, it developed 360 bhp at 10,000 rpm from its 60 degree V-12 configuration. With a capacity of 2989 cc., it had Lucas fuel injection, twin overhead cams, twin ignition, and on the early versions, two valves per cylinder. A new visual feature, to be seen on all future Grand Prix Ferrari, and adding a nice contrast to the ever-present red of the body, was the exhaust pipes with their heat-resistant white paint.

The chassis were new, but similar to the older monocoques, with bulkheads and braces holding together the various body panels and the two longitudinal fuel tank/side panels. Because of the larger power unit, the car was bulkier and heavier than the year before. Suspensions front and rear were similar to previous models, with rocking and transverse arms working off coil/damper units.

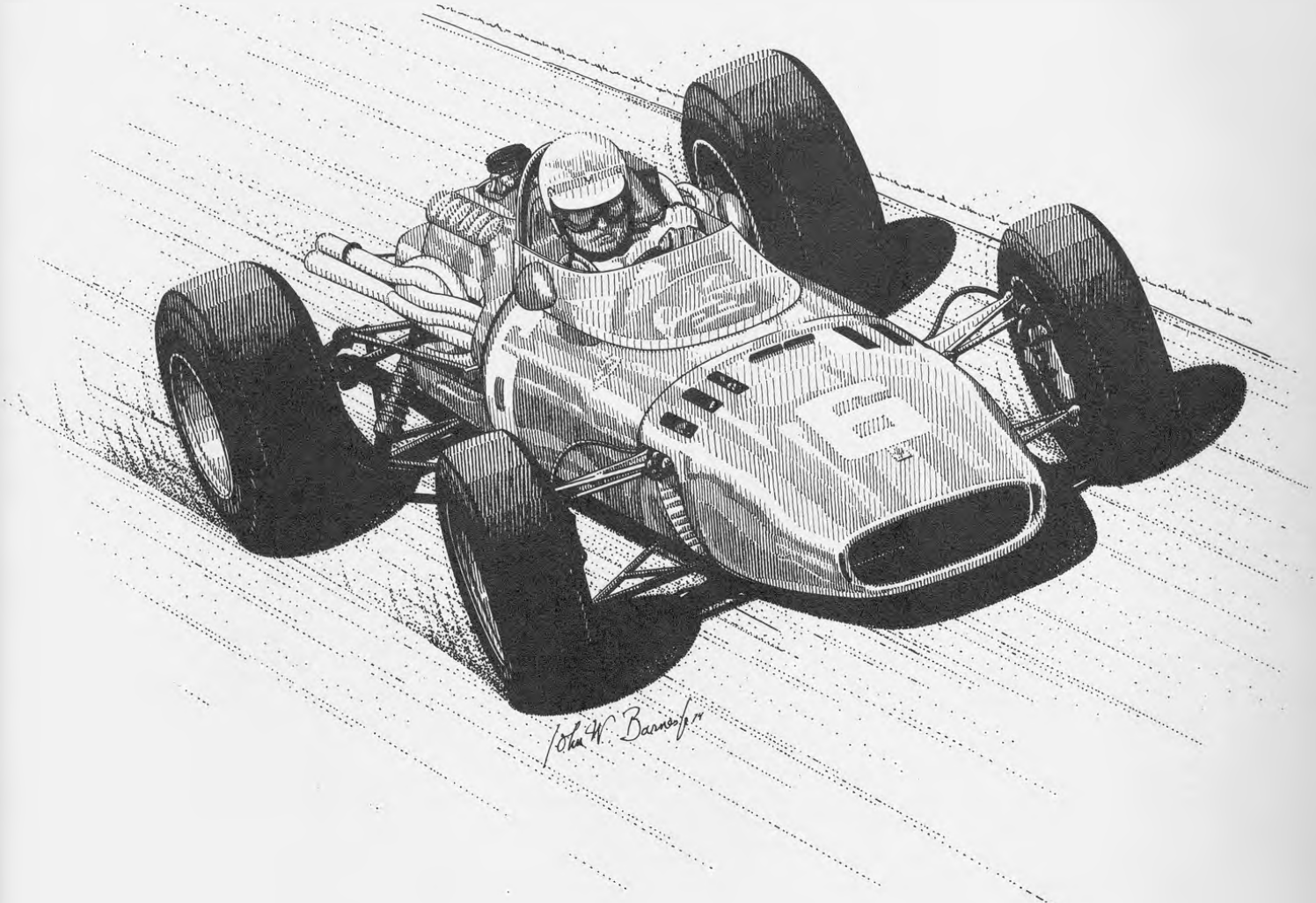
The shape was the benevolent product of an Italian mind, which is incapable, it seems, of producing anything either bland or grotesque. All details are just so, as witness the six rectangular slits on the upper body to vent hot air from the front radiator. It is continually gratifying to see that when something is designed for a very practical purpose, a bit more thought is given to how it looks, this latter not determining the former but evolving from it.

Successful as the car looked and fast as the engine was, the car never saw its potential realized. After Surtees had won Syracuse and Spa, with a 2nd at Silverstone, Ferrari appeared on his way to another championship. Abruptly at Le Mans, Surtees left the team. After a near-fatal crash in late 1965 in a Can Am Lola in Canada, Surtees had come back incredibly fast to all his former capabilities. But team manager Dragoni used this crash and the resultant disabilities (disabilities apparent to no one else though) to relegate Surtees to only a few hours of driving at Le Mans, giving his place to the new Italian, Ludovico Scarfiotti. To Surtees, the very epitome of the efficient and pragmatic Englishman, this final slight was the end. While the Italian love for honor, excitement, and byzantine machinations is in no way ignoble, it totally grates on the disinterested English soul. To the English, the Italians are gifted children; to the Italians, the English are courageous but crazy in their single-minded devotions.

And so, Ferrari fortunes sank through the rest of the year. Surtees was the missing element of an otherwise successful entry. His uncanny precision and balance gained from seven years as motorcycle champion, made him the equal with Clark's faultless style and Brabham's fabled mastery.

Ludovico Scarfiotti won the Italian G.P. in September with a revised 3-valve engine. It was the only notable finish for the first 312 in the remainder of the year.

Pages 44-45 — The new 312 with its 3-litre V-12 engine had an unfulfilled year in 1966. Scarfiotti won, though, at the Italian G.P.


John W. Barnes Jr.

312 1967

To cover the loss of Surtees, and to strengthen the capable, but not top-notch abilities of his 1966 drivers, Bandini, Parkes, and Scarfiotti, Ferrari hired Chris Amon, one of the youngest Grand Prix drivers, but also the fastest. Ferrari again displayed his shrewd judgment of young talent.

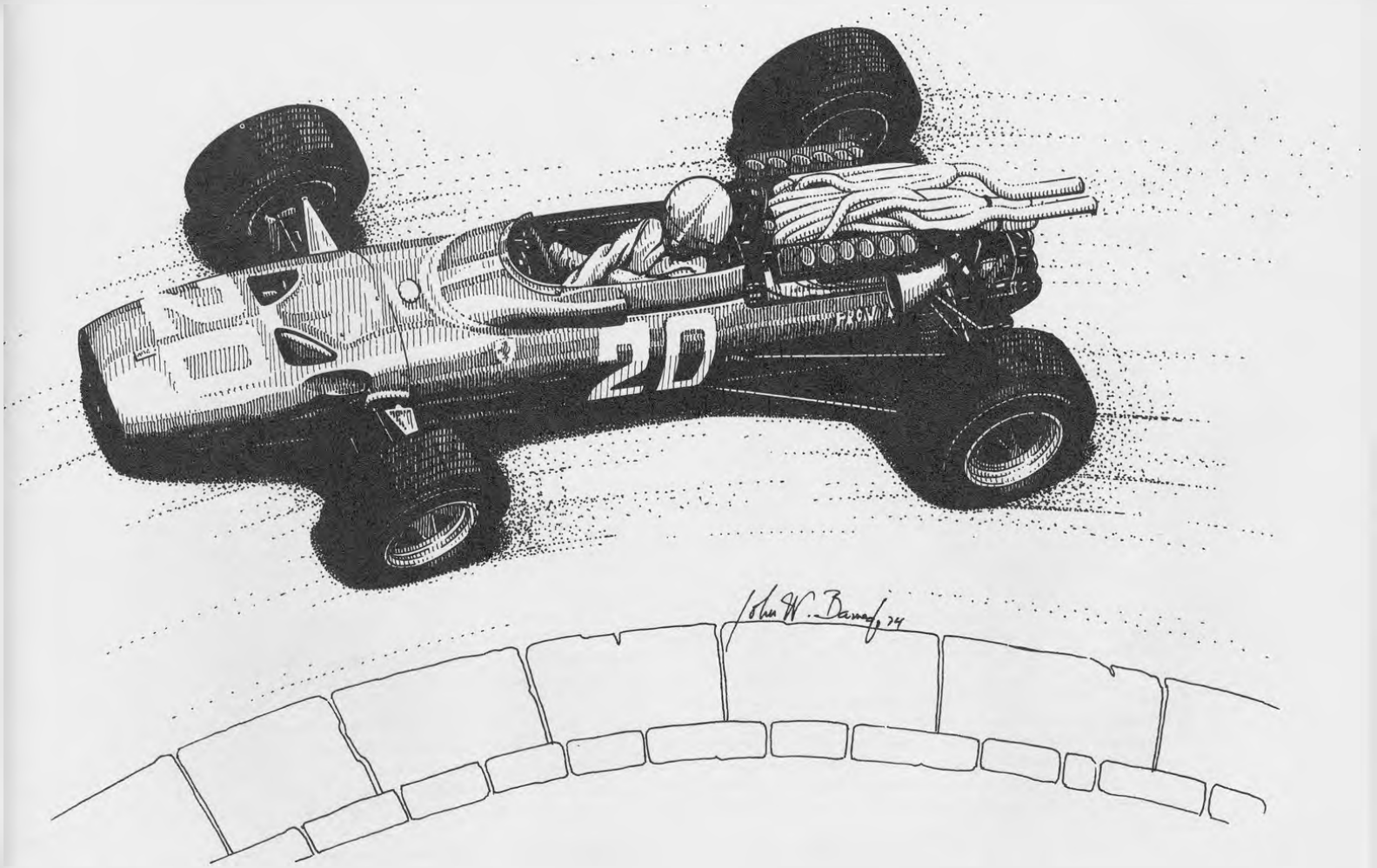
The 312 of 1967 was virtually the same as the 1966 car, excepting, of course, the engine. It was basically the 3-valve engine introduced at Monza, which had the two inlet valves between the two camshafts on each bank of six cylinders, and the one exhaust valve on the outer side of the engine, beneath the outside cams. This left a lot of room in the V, so for 1967, the exhaust valve was changed to the outside of the inner cam, that is, in the V itself. The effect was striking, twelve thin serpentine tubes (all tuned, by the way) winding their way up out of the engine to end in the final two exhaust pipes.

Changes in the body included a less abrupt nose, two finely cut triangular hot air vents on the upper body and fairings around the rear-view mirrors. The tires were becoming progressively wider, giving all the cars a more substantial appearance.

After a promising 2nd for Bandini at the Race of Champions, and an excellent 1st for Parkes at Silverstone, tragedy struck the team, for this was the year of Lorenzo Bandini's unfortunate crash, and unforgivable death at Monaco. Late in the race while in 2nd place, he hit the barrier near the chicane and overturned. As the car was righted by spectators and track marshals, it caught fire. Bad though the flames were, they were extinguished several times, only to be relit each time by the air wash of a news helicopter overhead that was covering the accident live for TV. Bandini was too badly burned and died in the hospital.

Other misfortunes followed. At the Dutch G.P., the Lotus 49 appeared with the Cosworth-Ford V-8, and, at the hands of Clark, immediately out-classed all other cars. At Spa, Parkes crashed, though not badly, but he left racing altogether, remaining with the Ferrari factory as a test driver and production engineer. Scarfiotti also retired, leaving Amon to carry on alone with a single car that was no longer fast or light enough to be competitive.

Pages 46-47 Rounding a corner at Monaco in 1967, new Ferrari driver Chris Amon acquited himself well, finishing 3rd in a car equipped with the 3-valve V-12.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PROVI
John W. Dana '24

312 1968

After the baleful misfortunes of the 1967 season, Ferrari rebounded with a lighter, more compact car, and a much, much lighter and more complex V-12 engine. In a search for even more power, Rocchi had developed a delightfully intricate head that packed four valves into each cylinder.

So tightly grouped were they that only one plug would fit amongst them, and so narrow was their angle to each other that the two overhead cams per bank could fit under one cam cover. The inlet ports were placed outside the engine, while the exhaust ports remained in the V. The whole unit was surprisingly compact, and the lightness was achieved through extensive use of alloys.

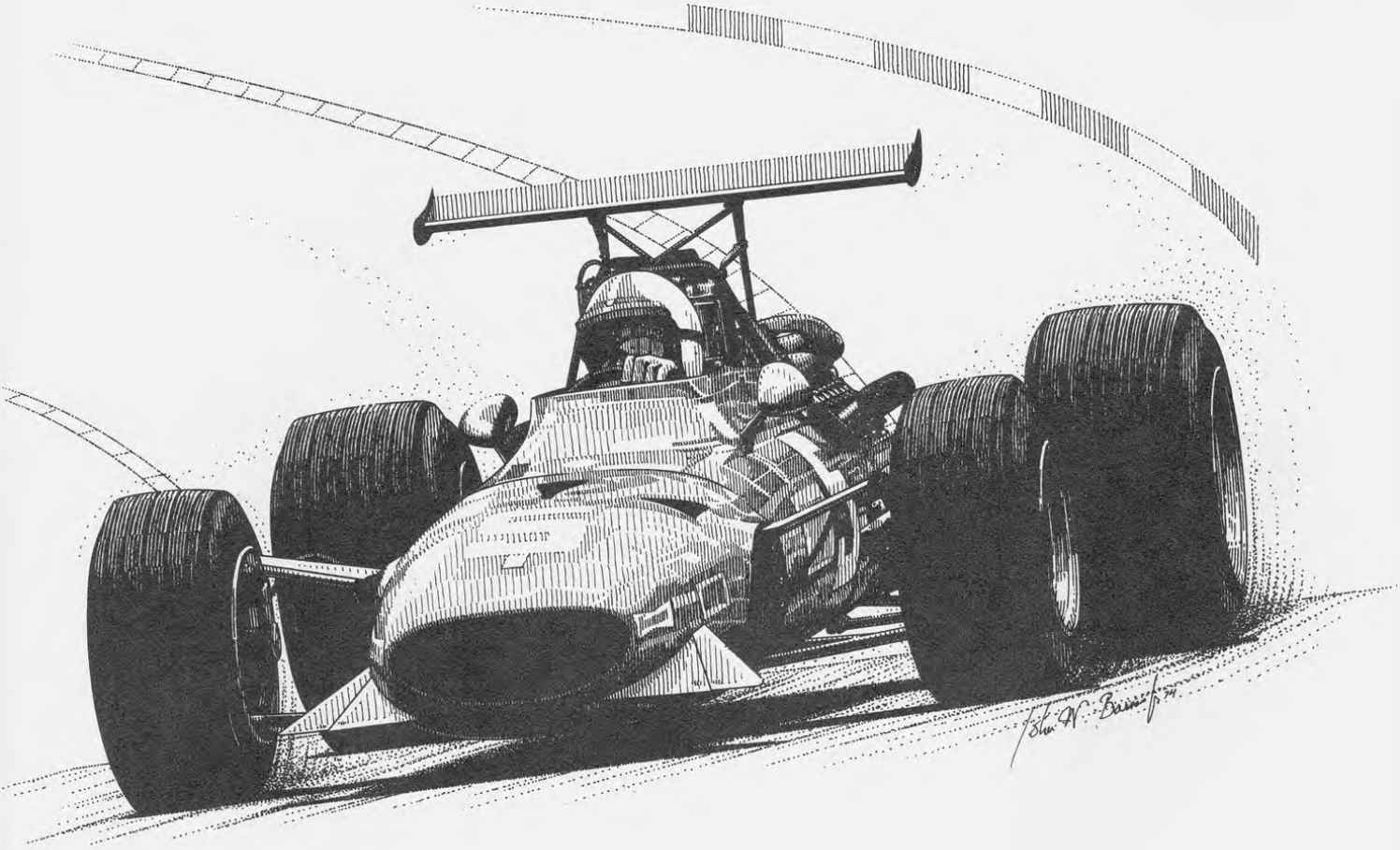
The new increases in power (supposedly 400 bhp at 11,000 rpm) were needed as Grand Prix racing was becoming very competitive indeed. McLaren and the private Matras were now using the Cosworth engine, as was Lotus. BRM had a new V-12, as did the factory Matras. The Brabham, Eagle, Cooper, and Honda teams all had good cars. To drive with Amon, Ferrari took on Jacky Ickx, another new young driver who in a few short seasons had come to possess all the speed, craft, and mastery of older, more experienced drivers. Between them, they established a reliable record for the car, with many 2nd through 8th places, the high point being Ickx's runaway victory at the French Grand Prix at Rouen-les-Essarts.

A new spirit of enthusiasm and innovation seemed to permeate the team through this year. The autocratic rule of team manager Dragoni was gone, with the businesslike Franco Gozzi first in charge, then the amiable Franco Lini. Forghieri was given a greater technical role in aiding the efforts of Rocchi.

The most innovative development made by Ferrari in a long time, other than in engines, was the introduction, along with Brabham, at Spa, of the rear wing for Grand Prix cars. Copied, of course, from Jim Hall's Chaparral that raced in Europe in 1967, they produced immediate results in cornering power as they glued the rear end of the car to the road from the downward pressure of the airstream on the angled wing. Other teams followed, everyone concocting strange and exotic constructions of thin tubing and wire, all reminiscent of the early days of aviation. The strength of the airstream was underestimated, and most wings suffered various collapses and breakages, finally moving the CSI at Monaco in 1969, to ban them completely unless they were part of the actual bodywork. Through 1968, Ferrari had generally good results with his aerofoils, mostly using a complicated, hydraulically controlled rear wing, augmented by small triangular aerofoils attached solid to the front nose.

The 1968 cars, compact and ingenious though they were, were slowly losing both power and stability to the Cosworth-powered competitors.

Pages 48-49 Chris Amon tried hard with the beautiful but uncompetitive 312 of 1968, here finishing third at Brands Hatch.



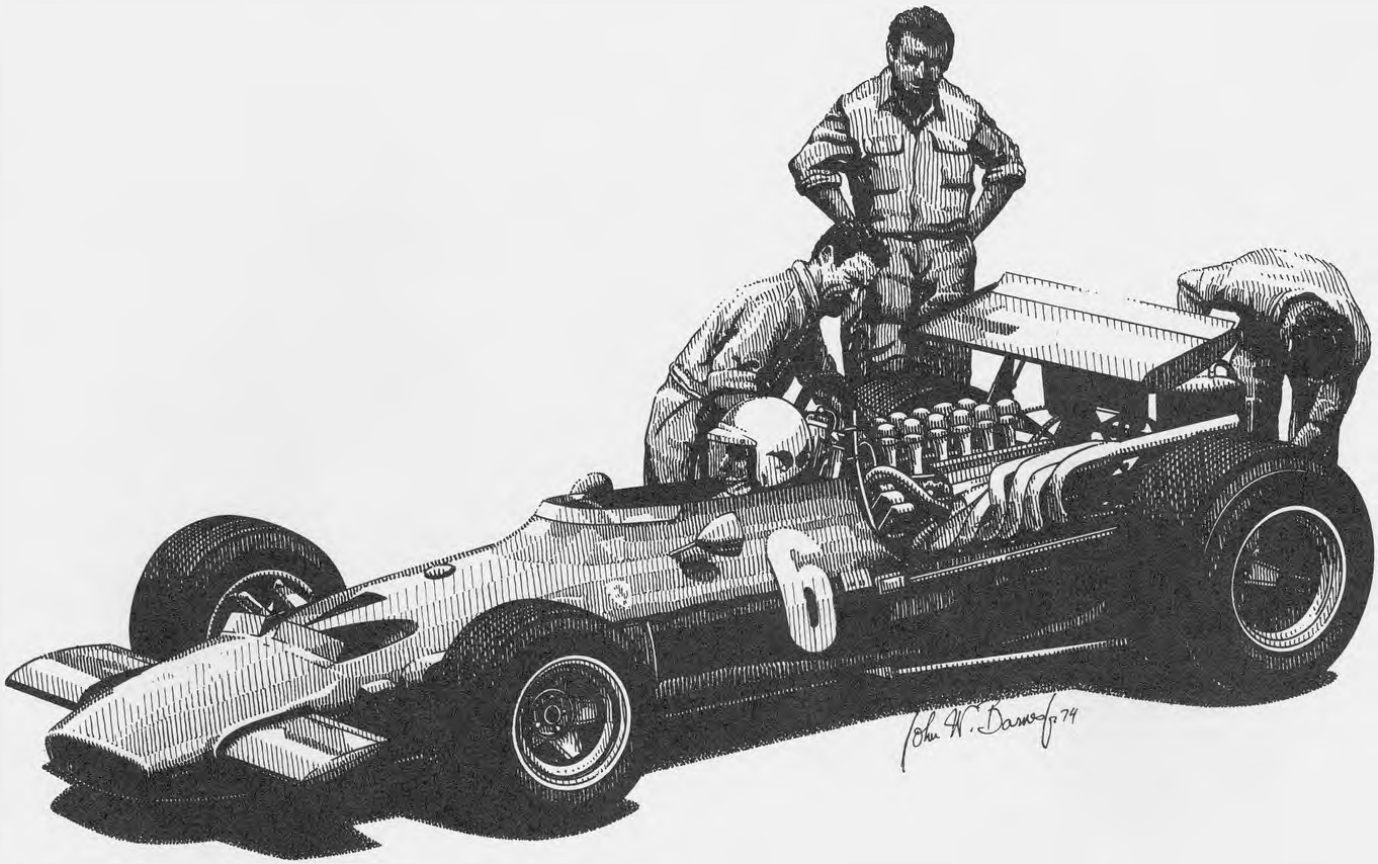
312 1969

At the beginning of 1969, the 312 in its present form was a solid, reliable car, but everyone knew success for it was to be elusive. There was no more power to be gained from the V-12, even with the new changes made by Rocchi. The inlet ports were now placed in the V, with the exhaust on the outside of the engine. New cams were added and better lubrication was found, but in an ill-advised effort to reduce weight in the engine, too much was shaved from bearings and such, causing several retirements during the season due to engine failure. So problematical (and slow, in comparison to the Cosworth) was the engine that by the Italian Grand Prix, the older 1968 version, with exhausts in the V, was placed back in the car.

The chassis used for 1969 was the same as that used in 1968, with only minor changes. The front aerofoils were now rectangular in shape and mounted to the side of the nose, and were parallel to the road. The rear aerofoil, after being banned at Monaco by the CSI and then reinstated after the Dutch G.P., was fixed to the chassis directly behind the engine.

Altogether, it was a very neat and refined car, but, as stated, its success in 1969 was very much in doubt. Ickx left the team even before the start of the season, and Amon stayed only because of promises of a new flat-12 engine being developed. Its appearance was delayed, and by Monza, Amon refused to drive the present car any longer. Pedro Rodriguez drove it in the final races of the season with indifferent results. It was simply a matter of filling time with a dependable but outdated car until the new 312 could appear.

Pages 50-51 The 312 Ferrari in its final form with the 3-litre V-12 had a very poor year. Amon waits while adjustments are made at the French Grand Prix of 1969.


6
John W. Dawson 74

312 B 1970-1971

Since the introduction of the rear wing on Grand Prix cars in 1968, the full potential of aerodynamics in racing was very quickly realized. If a wing would provide better traction and stability, why not utilize the whole body as a primary aerodynamic component to do the same thing? This Lotus did, in its beautiful wedge-shaped 49B cars of 1969. The bodies of all future Formula I cars would have to follow strict aerodynamic laws.

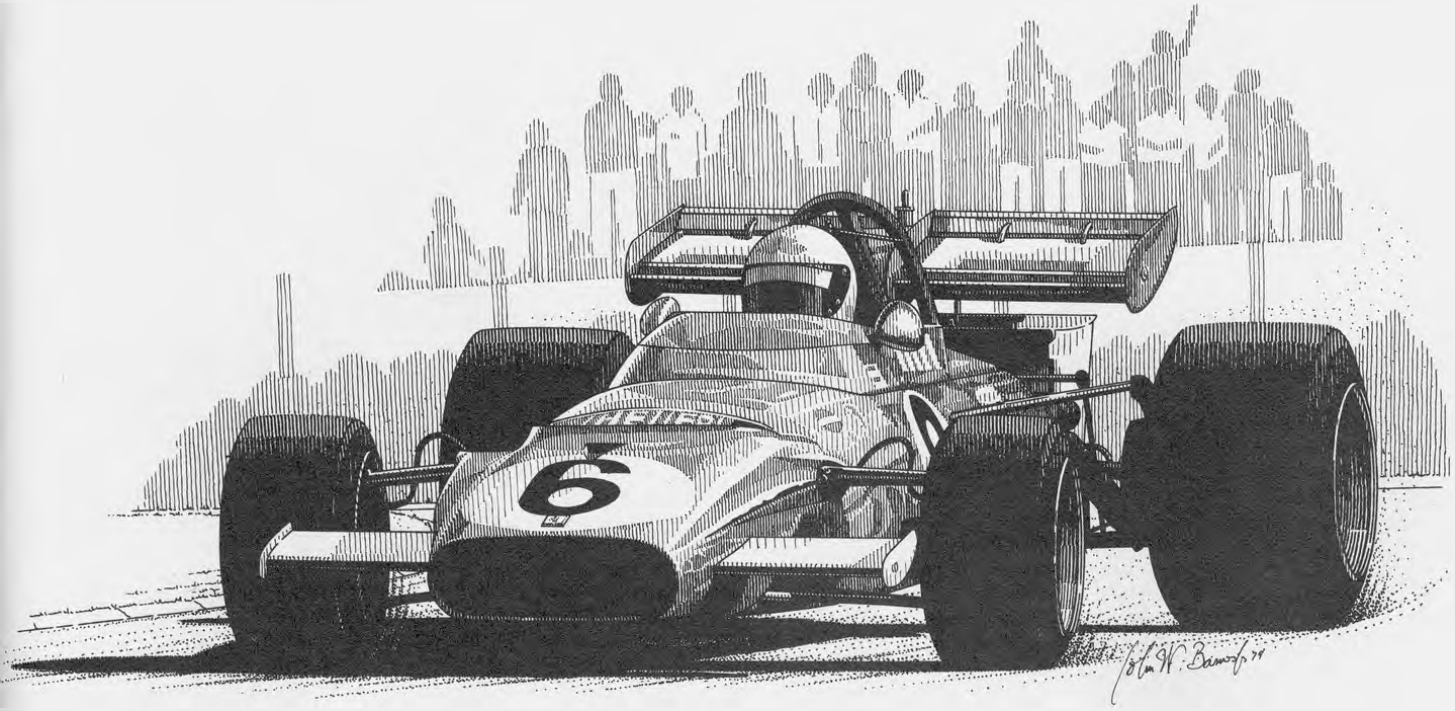
Even as work was progressing on the flat-12 in 1969, a new body was also being built, and it supposedly was the first one for which Ferrari made really scientific use of a windtunnel. It was essentially a space-frame monocoque, made up of a multitude of thin tubes, over which riveted aluminum plates were stretched for reinforcement. The nose was lower and wider, the front wings were thinner and more angled, and the whole body to the rear was perfectly smooth and clean, with fairings covering any small outcroppings. Because of its flat-12 configuration, the engine was now completely out of the airstream, hanging as it did from a stressed beam behind the driver, and not sitting in a tub, as in earlier cars. The rear wing, with end plates, was mounted on that beam, directly above the rear suspension, and tight, square-shaped funnels brought air to the oil coolers.

Mauro Forghieri was the primary designer of the new chassis and it was his engine as well. Based on the 1.5 litre flat-12 of 1965, it had only four main bearings, a special alloy crankshaft, four valves per cylinder, two overhead cams per bank, Lucas fuel injection, and developed 450 bhp at 12,000 rpm. Such phenomenal internal speeds took their toll on the early engines, with many failures in the crankshaft, connecting rods, and valves. The new infusion of money from Fiat's new association with Ferrari helped solve many of the problems, so much so that the car was a great success through the last half of the 1970 race season.

Jacky Ickx was now driving again for Ferrari, taking one lone car to the early races, and retiring with troubles. By the Belgian G.P., Ignazio Giunti was in a second car, and he managed a 4th. Clay Regazzoni, the alternate driver, gained a 4th at Brands Hatch, Ickx was 2nd at the German G.P., and finally he won at the Austrian G.P. with Regazzoni 2nd. Regazzoni countered at the very next race at Monza by being 1st. At the Canadian and Mexican G.P., it was Ickx, 1st, and Regazzoni in 2nd place. All these wins were not enough to take the championship away from Jochen Rindt and the Lotus 72, and while it would be unkind to suggest that Ferrari only won these races after Rindt's crash at Monza, his death did remove Ferrari's primary opposition.

A new 312 B2 car was being developed for 1971, but for the first race of that year in South Africa, the 312 B was used. Mario Andretti, the third team driver now when his USAC schedule permitted, promptly won the race, with Regazzoni 3rd. The car went on to win two non-championship Formula I events, at Ontario, California with Andretti; and at Hockenheim, Germany, with Ickx, before being retired. As a winner of five championship races, and the two non-championship ones, the 312 B was one of Ferrari's most successful entries.

Pages 52-53 Totally new, the 312 B with its flat-12 engine did very well, Mario Andretti winning easily in South Africa in 1971.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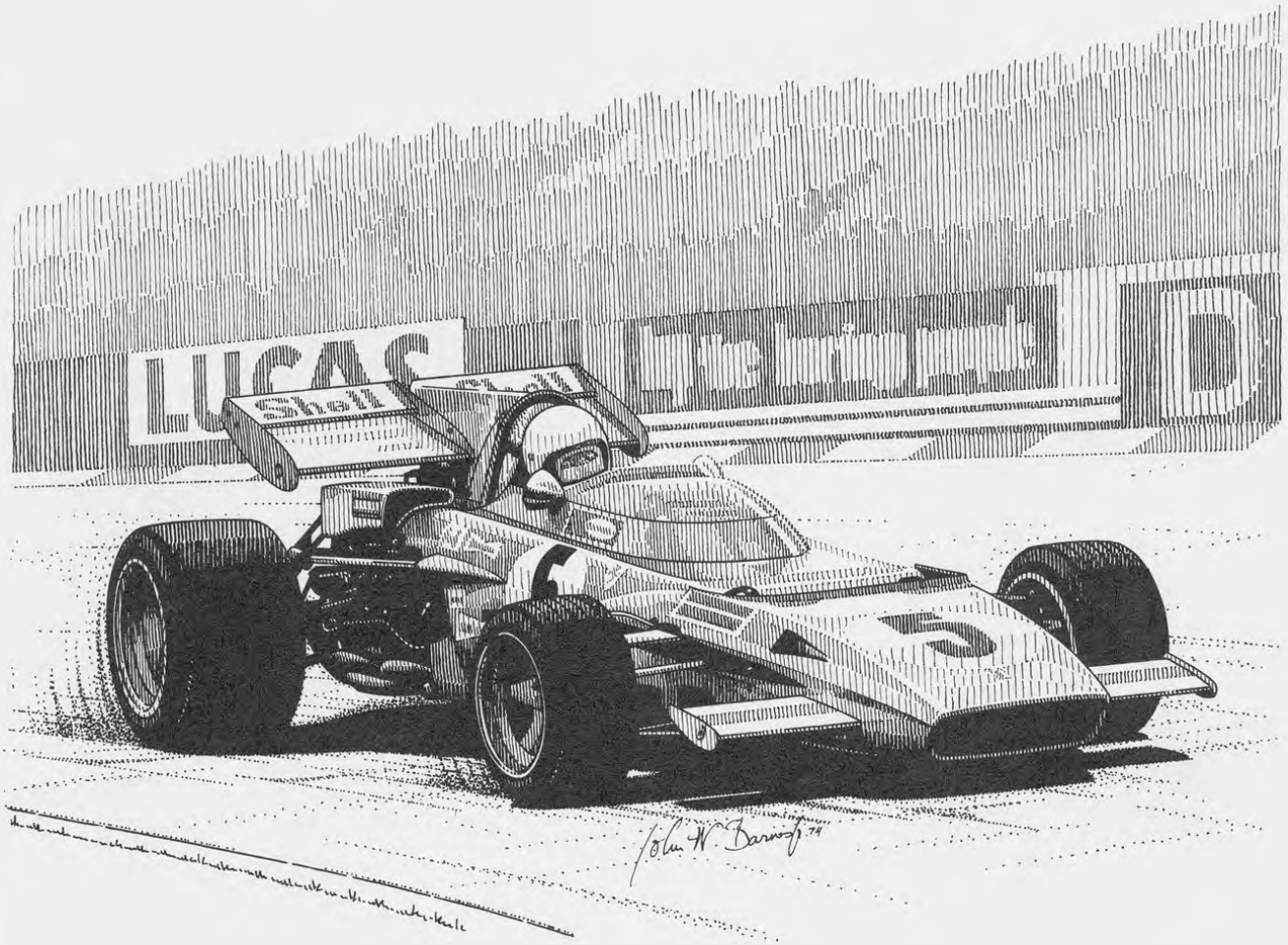
312 B2 1971

The 312 B2 was basically an update of the 312 B, but many changes and refinements were made to keep it current and competitive. The body was lower and boxier at mid-ship, with two neatly-placed bevels running forward along the upper body tying that square midsection to the dropped wedge-shaped nose. The whole, flatter upper body brought a more efficient translation of airstream into downforce, and the cockpit area was visibly smaller, with a new fairing behind the roll bar. The former abrupt oil cooler scoops were flattened, air being drawn in through large NASA-style ducts. While the 312 B, advanced as it was, was still barrel-bodied and bulky like earlier Ferrari, the 312 B2 was part of the new generation of Grand Prix cars by being extra light, ultra compact, and beautifully efficient. Smooth aerodynamics was such a concern now that the rear suspension was re-designed just to remove the coil/damper units out of the airstream. A complex arrangement of upper and lower wishbones, radius rods, and transverse vibration dampers brought the two coil spring units up behind the oil coolers, almost horizontal, and connected to each other at their base by one bolt in the chassis, directly below the central rear wing mount. The rear brakes were also brought inboard. All these elements in the rear, plus gearbox, batteries, and exhaust pipes, added up to a veritable Chinese puzzle. A return to roller main bearings was the only major change in the engine.

Ferrari now had the services of Andretti along with Ickx and Regazzoni, and it was the latter who had the first win in the 312 B2. With the help of dry tires, while all others were on intermediates, he passed Stewart halfway through the race, and comfortably won the Race of Champions at Brands Hatch. Jacky Ickx followed this with a bedraggled 3rd at Monaco, and finally a brilliant, rain-soaked 1st at the Dutch Grand Prix.

From this point on, things deteriorated badly. The new Fiat money was able to finance full teams of Formula I cars and 312 P sports prototypes, but the technical resources of the Ferrari factory were being stretched too thin. Forghieri, as an example, was being asked to head development of each type of car, plus be team manager for both. Added to this were labor troubles affecting all of Italy. The Ferrari factory workers, while loyal, had to follow the dictates of outside union heads, and there were frequent interruptions. When the Formula I team drivers were not being overshadowed by the unstoppable Stewart in his Tyrrell, the cars were succumbing to chronic engine failure. The season ended with no other notable placements for the Ferrari team.

Pages 54-55 An update of the 312 B, the B2 won its first race at the Race of Champions in 1971 with Clay Regazzoni driving.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312 B2 1972

Whereas in 1970 the 512 sports prototypes were neglected in favor of the 312 B Grand Prix cars, with a consequent four wins toward the end of the season, now the primary developmental efforts were placed on the new 312 P sports prototypes, leaving the 312 B2's to languish, and languish they did. The word had filtered down from Fiat, apparently, that a World Manufacturers Cup championship was needed to help promote the sale of Ferrari production cars. A win at Le Mans or Daytona brings more general publicity than a whole string of Formula I wins, and this fact was known to Fiat. The prototype cars were also more closely indentifiable with the production cars, thus the evident promotional connection. What advertising gains that were realized is questionable, but the prototypes won every race that they entered in 1972.

As mentioned, development was minimal on the Formula One cars, and this was partly due to the belief that the car as it stood was a basically good car, potentially faster than the rest, and needing only minor improvements and concentration on detail preparation to make it reliable and a winner.

The most basic change was a return to the earlier rear-end suspension of double wishbone and combined coil/damper units. The 1971 suspension, while beautifully exotic (one can only be sad that it did not work), caused endless minor problems, being hard to set up for a particular course, and producing vibrations that ranged from simply annoying to debilitating.

Externally, the only changes were minor attentions to aerodynamics, with a long cowl stretching from over the roll bar back and into the rear wings, the wings themselves being wider and flatter over the length of the chord. This gave the car an even smoother streamlined appearance, while the other Formula I cars were looking more angular and piece-meal. The body was now as all-enveloping as possible, just short of absorbing the four wheels themselves.

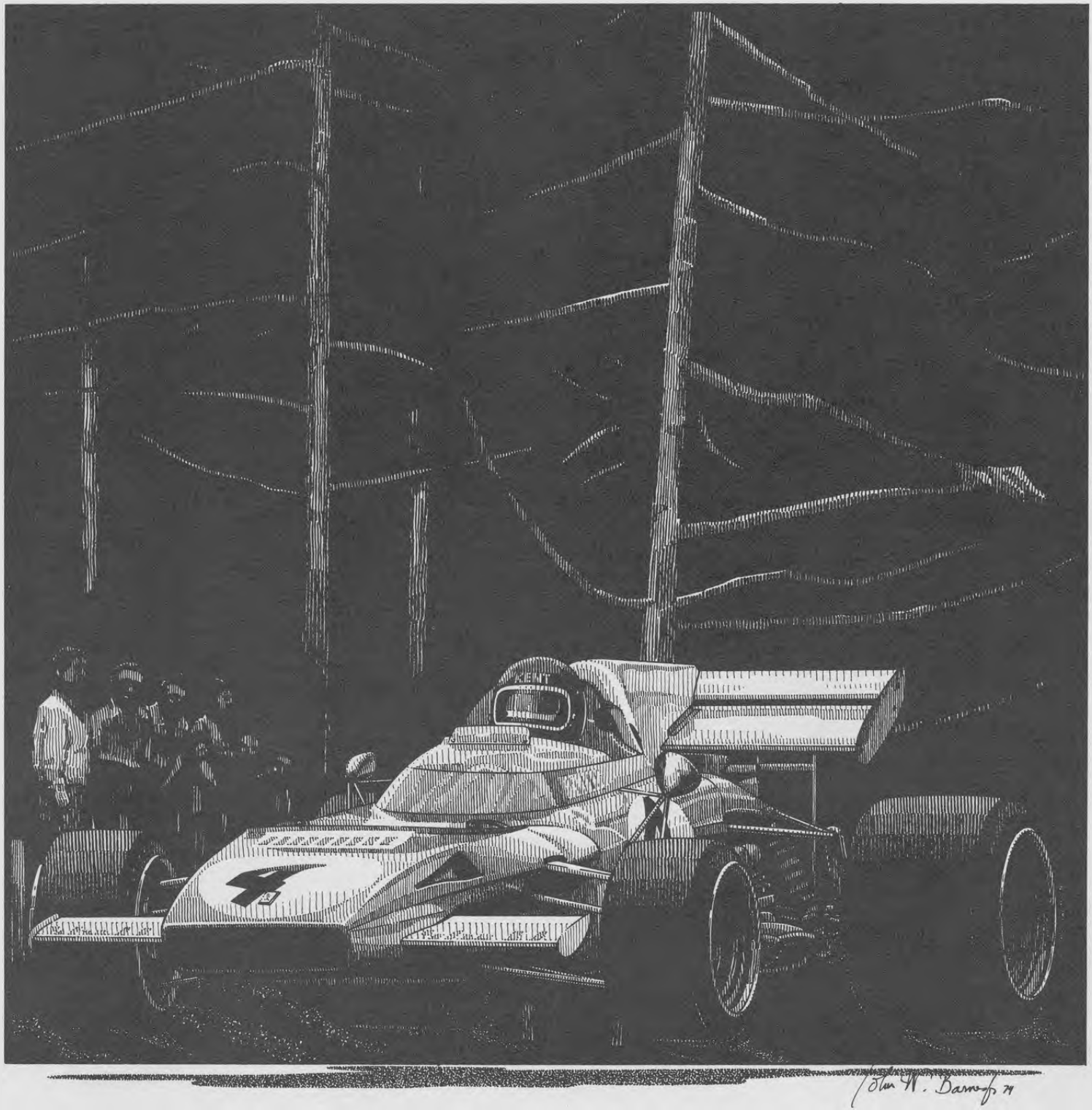
Even with these improvements, the season for Ferrari can only be described as respectable, with one win, several 2nd's and 3rd's, many 5th's through 13th's, with only a very few crashes and retirements. The cars just never found their consistent speed, and handling and chassis difficulties, while in no way disastrous, were dispiriting. Variations of the rear wings and flatter noses were tried, plus changes in the rear suspension. By the time of the Austrian G.P., even the long aerodynamic cowl behind the driver was cut as being of little help. The ducts to the oil coolers were also eliminated, leaving them and the rear wing free and open in the air stream.

Such apparently aimless development and lukewarm results were noticed back at the factory, and as in the past, someone was singled out, this time Forghieri, who was assumed more into Fiat to do overall design work. Alessandro Colombo replaced him, and Peter Schetty continued his usual good work as team manager, making the team itself both capable and efficient, even as the cars were lacking.

The only relief for Ferrari in the whole season, and as everyone conceded, one of the few completely thrilling moments of the racing year, even overshadowing Stewart's and Fittipaldi's fight for the Drivers' Championship, was Ickx's overpowering victory in the German Grand Prix at the Nurburgring. Starting on the pole, he soon outdistanced everyone, and ever after gaining a comfortable lead, he never let up. Visibly faster than all the rest, minutely more precise and controlled in the endless series of turns, cresting the several bumps, dead level, and floating over through a perfect arc, the drive was considered astounding. The car ran without fault, its muffled whine rising and falling through the forest in the distance, smooth, endless, without a miss or sputter.

Even though Stewart and Fittipaldi eventually dropped out, they both said there was no catching him. Ickx became one of the few "Ringmeisters," and the Ferrari victory that day still has not been forgotten.

Pages 56-57 Taking one of the many jumps of the Nurburgring with the utmost ease, Jacky Ickx drove uncontested in his 312 B2 to win the 1972 German Grand Prix.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John W. Barnes 74

312 B3 1973

In the interest of safety, new rules were prescribed by the CSI for 1973 to make the chassis of all Formula I cars safer in a crash. The central tub of such chassis had to be of a "deformable" type of structure, outer layers of the body crushing first in an accident, leaving the inner, enclosed fuel bladders hopefully untouched. This immediately obsoleted many Grand Prix cars, including the 312 B2.

Work had begun on an updated 312 B2 in 1972 to be called the 312 B3, but with the temporary demise of Forghieri, this car was abandoned, and a totally new 312 B3 was prepared. Designed by Allesandro Colombo and Franco Rocchi, its monocoque construction followed the latest theories of FI construction. Three major bulkheads were the basis of the car, to which everything was attached. The front one supported the front suspension and nose cowl, the middle held the driver and fuel tanks, the last one in the rear had the engine bolted to it, making the engine now a stressed member.

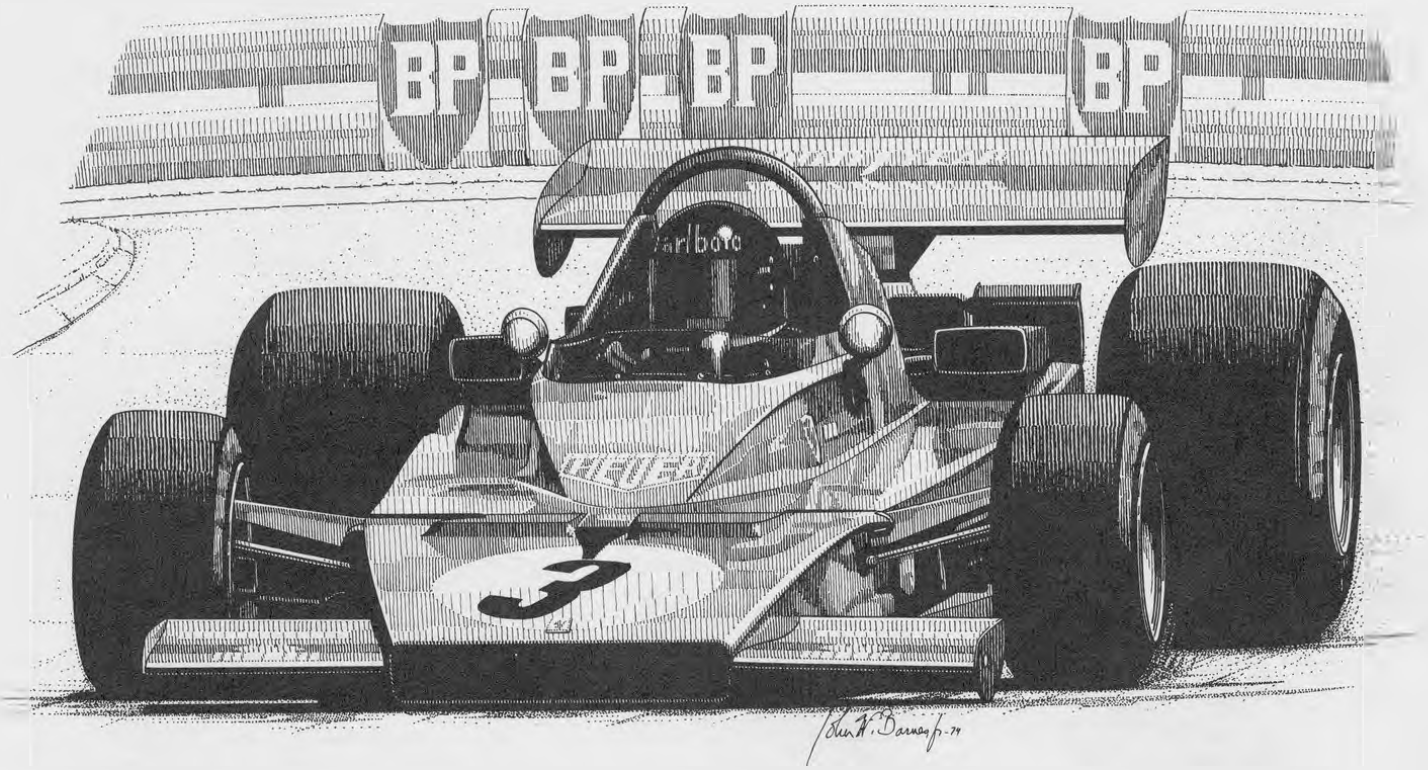
It was the first time, by the way, that a Ferrari frame was built outside of Italy. Either because of strikes in Italy, or because of John Thompson's expertise in building monocoque bodies, the 312 B3 tub was constructed by Thompson's works in England. It is hard to describe the outward appearance of the car, because it changed continually throughout the season in a desperate effort to find the right combination. The engine was reliable again, and just as strong, but those small, important adjustments in body shape, wings, and suspension were continually troublesome. Essentially, it was a very flat, rectangular box, thinned and rounded at the nose, with a high wing at the tail. The cockpit was now more upright, looking very much like a blunted conning tower.

On the first cars, the radiators were mounted on the sides with long, attenuated NASA scoops along the flanks of the body leading to them. The nose was one broad wing, split by vertical plates for stability. Small airscoops near the cockpit, above the radiators, fed air to the inlet ports. Fabricated around the gearbox was the oil tank, to which the rear wing and the oil coolers were attached.

Almost immediately at the Spanish G.P., the cars were overheating, so the water radiator was switched to the front, opening the nose again. By Monaco, the older, flat nose was back, with a cowl around the front opening and wings attached to the sides of the nose. The cars were withdrawn from the Dutch and German Grand Prix, being resurrected at the Austrian G.P. with many alterations ordained by the newly-resurrected Forghieri. The oil tank was moved to the inside of the body shell on the right behind the fuel bladder, and the oil cooler was mounted to the same spot, but on the left. On the outside of each fuel bladder were the new radiators, severely angled and almost horizontal. Cooling air entered behind the front wheels through swept-back inlets and exited through thin, longitudinal vents on the top deck. Above the engine stood a flat air-collector scoop perched on a stand that attached to the engine cover. The front wing now stretched across the nose of the car, the nose itself below the wing and deeply shovelled.

Though improvements were made, the results were not too readily apparent. The season continued as dismally as it had begun. Andretti had left the year before, as had Regazzoni. Ickx was now paired with Arturo Merzario, a new driver of deceptively frail appearance, but with excellent stamina and speed. In the six races from Spa to Silverstone, the cars did very poorly. Inevitably, Ferrari blamed his drivers, most notably Ickx, complaining that he was not giving his all. Ickx countered that the cars were just not competitive. When Ferrari withdrew from the Dutch and German G.P., Ickx left the team, re-surfacing in a McLaren at the Nurburgring to finish a credible 3rd. He was enticed back with the revamped car for the Italian G.P., then left the team for good when the car did no better. Merzario carried on, filling out a poor year.

Pages 58-59 Through 1963, the 312 B3 did poorly, Ickx holding on as best he could to finish 5th in the French Grand Prix.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312 B3 1974

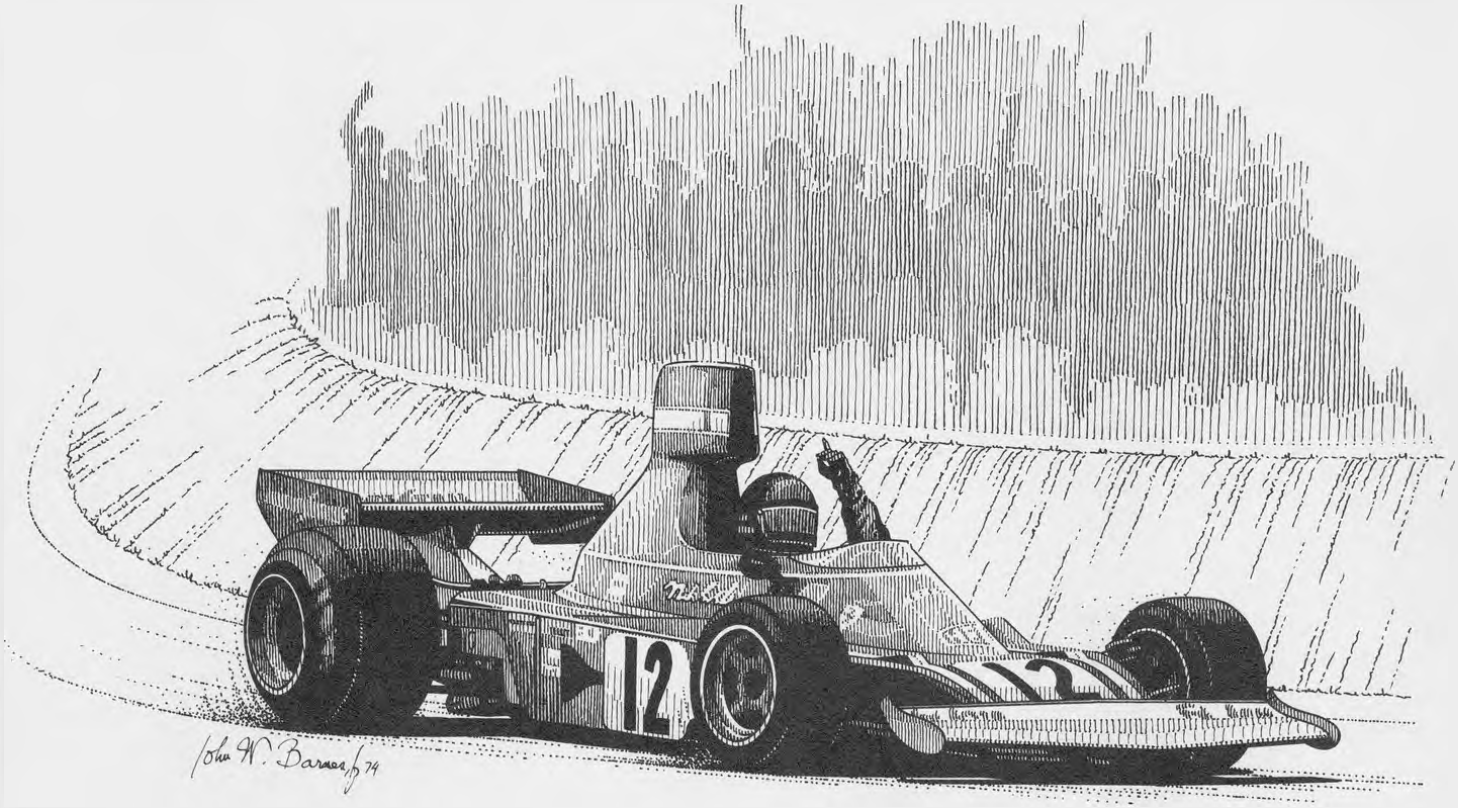
In this, the 26th year, Ferrari again is supreme, contrary to all predictions that he would never be as great as before. Other teams slowly die when their fortunes turn sour, or they are taken over by more hopeful owners. But even in times of the most disheartening losses, it is evident how much Ferrari Grand Prix cars are the passion of one man. When a Ferrari does poorly, even for several seasons, there is no thought of retreating, but simply a continued development until the cars are good enough to win again.

And this year they are winning, and against very formidable competition. All the promise in the 312 B3 design is becoming fully realized. The cars are fast, extremely fast, they are stable and untroubled on most of the tracks, and most importantly they are now surprisingly reliable. After last year's retirement from prototype racing, all the available money and talent was bestowed on the Grand Prix project, and the results are gratifying. The only real changes on the 312 B3 are the more penetrating front wing, an improved rear suspension, and the now vertical air intake cowl over the driver's head.

Most of the success so far this year is from a greater attention to detail on the part of the team, as the cars are arriving at each race already set up, and trouble free. Much credit is due, as well, to the drivers, who before the start of the season, gave no indication of their present success. Niki Lauda, in his first Formula I season last year, was reported to have had to buy his rides in order to race, but now he is Ferrari's number one driver, and is headed hopefully for the championship. Clay Regazzoni has lost much of his former impulsiveness and is now driving very smooth and steady, consistently finishing in 2nd through 4th places.

As mentioned, the cars are very fast, noticeably faster than all the others, sitting on the pole (and at times, commanding the whole front row of the grid) in most of the eleven races run so far this year. Lauda has won the Spanish and Dutch Grand Prix, and only missed winning the British Grand Prix when a tire went flat. At this writing, Regazzoni has come through to win the German Grand Prix at the Nurburgring, placing himself now in contention for the Drivers Championship, and keeping Ferrari on top in the Constructors Championship. Even if ultimately these championships are not won by Ferrari and his drivers, they have shown themselves to be brilliant again, and it will be long remembered.

Pages 60-61 Corrections made on the B3 produced a winning car, Niki Lauda waving to the crowd after winning the Spanish Grand Prix of 1974.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