

by OCee Ritch

ONE OF THE OUTSTANDING new features of the car is a central 'spine' or backbone which replaces the conventional frame. This spinal column is a large diameter tube, through which passes the driveshaft, bolted to the engine in front and the differential housing at the rear to form a rigid unit. Swing axles and independent suspension assure good roadholding and ride...

Sounds good. Which one of the new Detroit products is it? Will we see it in 1961? The new Tempest, you say? The car described above was the Tatra, built in 1930.

And how about this for a dream car: "... very light but inflexible is the cast aluminum frame of deep section. The fuel tank is flat and under the floor for a lower center of gravity. Finned wheels with integral brake drums are also cast in light alloy. The car's suspension is also unique: live rubber discs are used rather than coil springs and are so arranged as to provide inherent damping... no shock absorbers are necessary. The engine employs 'vapor-phase' cooling, wherein the coolant is kept at boiling in a closed system. Greater efficiency and longer engine life are the results. Power is transmitted through a fully automatic torque converter to a new type of limited-slip differential..."

Ready to place an order? Better not, the Sensaud de Lavaux was offered for only a short time in 1926.

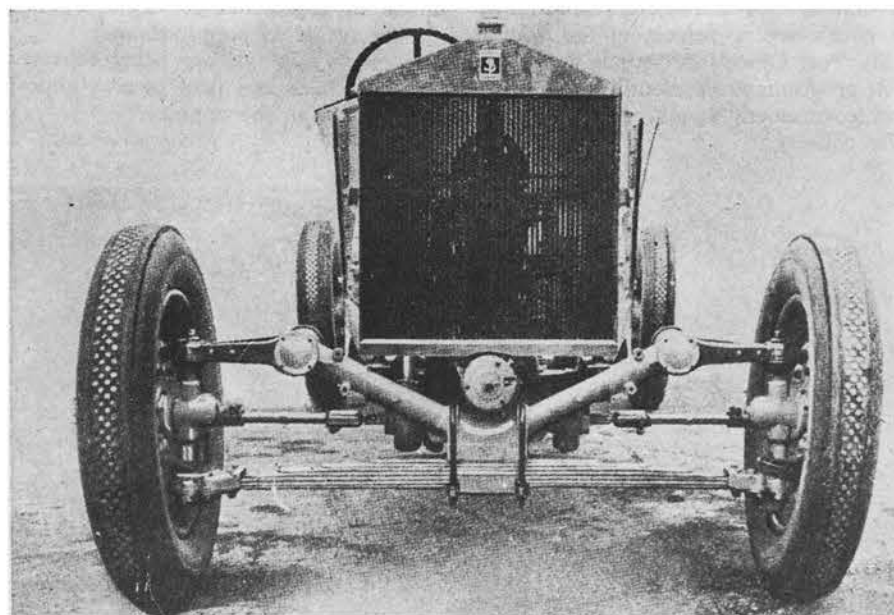
The trite saying "There's nothing new under the sun" has been repeatedly used as an accusation against the automotive industry but this is not really fair. It is the public which ultimately decides the fate of all commercial enterprises, and the public is noted for being stubbornly conservative. Actually, few of the so called "great" cars, the automobiles listed at the top of the desirability roster, have ever pioneered any automotive advancements.

Take Rolls Royce. An unqualified success as a car and as a wanted piece of equipment, Rolls has incorporated nearly every adjunct to smooth motoring, and labor-saving or attention devices abound — but each part is selected because of a history of reliability, not for uniqueness. This British firm resisted hydraulic brakes for many years because they considered their servo-assisted mechanical type nearly foolproof and failure proof.

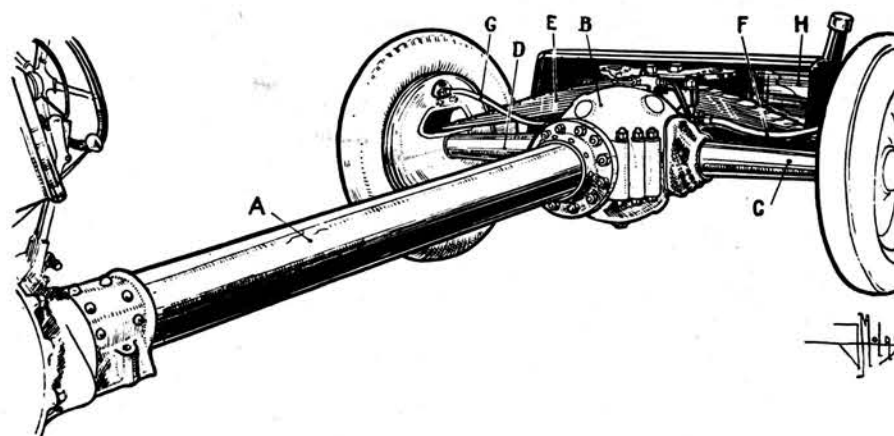
Backbone frame of the first Tatra, a Czech car still being made, was a forerunner of GM's Tempest. Tatra engineering was later changed, with aircooled V-8 in the rear.

Many engineering ideas born before the public was ready for them have had to make their debut a second time.

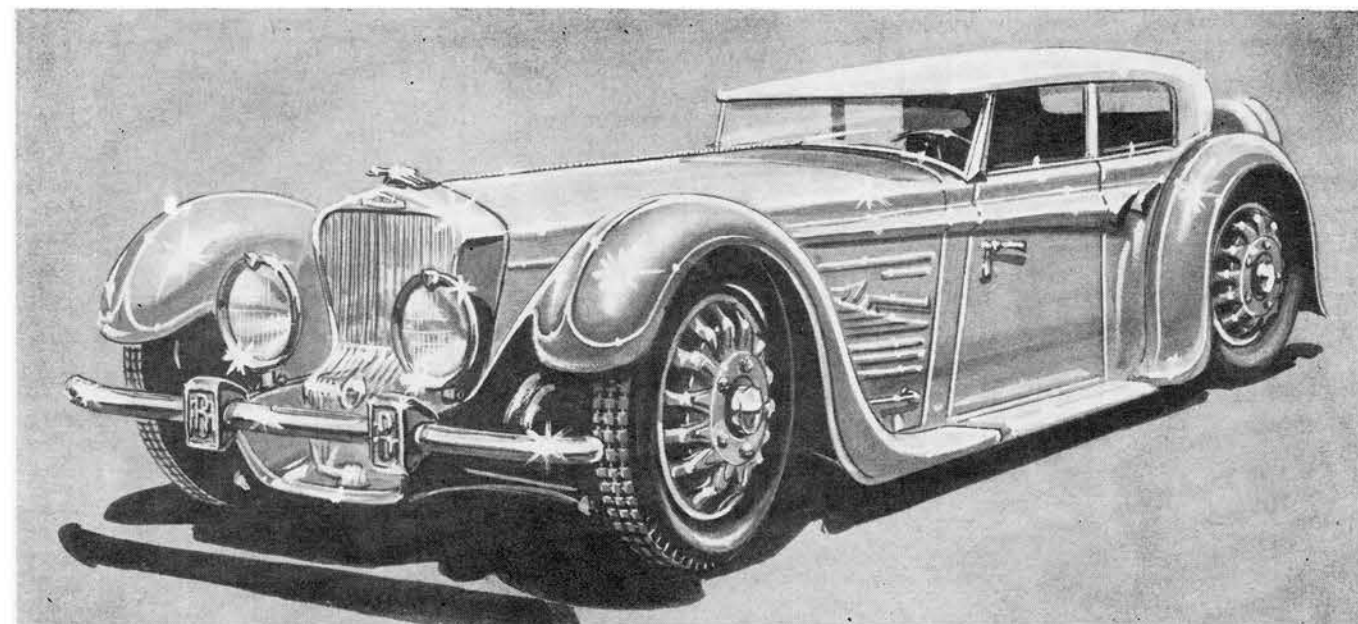
Here are a few that haven't come around again yet — but who can tell when they'll be "discovered" and touted as "new concepts"...



The 1922 Sizaire Six, an early front-wheel-drive model, showed ingenuity in suspension. Bottom transverse spring and sturdy arms at top were an inexpensive manufacturing trick.



So What



Introduced at the 1933 Paris Auto Show, the Bucciali was a sensation. It had f.w.d., an aluminum V-16, integrally cast aluminum

wheels and brakes, four-wheel independent suspension and rakish silhouette. Although much raved about, no one bought them.

It has always been the lesser-knowns, the small firms trying to break into the game or an old-line company struggling against bankruptcy, that have come up with the wild-eyed designs that should shove motoring ahead a decade in one year.

Interestingly enough, nearly 100 per cent of these sensational developments have failed in exactly the purpose they were supposed to accomplish. However, the principles or ideas usually show up in due course worked into a conservative model that the public will accept.

If you ever plan to go into the car business it might be well to keep in mind the fate of the Cord, Tracta, Isotta-Fraschini Monterosa, Chrysler Airflow or Bucciali — and build something that

by VW, Porsche and Corvair, why not consider an all-aluminum water-cooled V-8 using the same layout? The Isotta-Fraschini Monterosa model, which marked this old firm's return to the automobile manufacturing scene after World War II, bloomed and withered like a flower on the desert but it had a lot of good ideas including a short three-liter (183-cubic-inch) V-8 in the rear.

This engine had inclined valves, a hemispherical combustion chamber head design with centered spark plugs and hydraulic tappets. A five-main-bearing layout utilizing forked connecting rods kept it extremely short and rigid. An integrally-cast gearbox had four forward speeds and overdrive.

has been demonstrated by tests to have the longest life, provide more strength-for-weight, and develop fewer rattles and squeaks than any other auto body design. The 1934 Chrysler Airflow was an early American experiment in selling this advancement to the public but it wasn't until recently that modified "unibody" construction has been widely adopted. All you have to do is substitute aluminum for the steel stampings and you'll shave a lot of pounds off your new offering.

Why not? A foundry expert named Sensaud de Lavaux designed an automobile back in the 1920's that made the widest possible use of aluminum alloys. The frame and firewall were aluminum castings of huge (for those days) size

Else Is New?

looks almost like last year's most popular sedan... only not quite. Trying to lure shekels from the public with a "16-cylinder all-aluminum, double-overhead-cam engine" and "front-wheel drive with continuously variable pneumatic suspension" will cause you great frustration.

On the other hand it has been proven that a few touches dating 20 years or so in the past can be inserted into your design with great fanfare and assurance of acclaim. In case you are thinking about entering this phase of the business, here are a few possibilities:

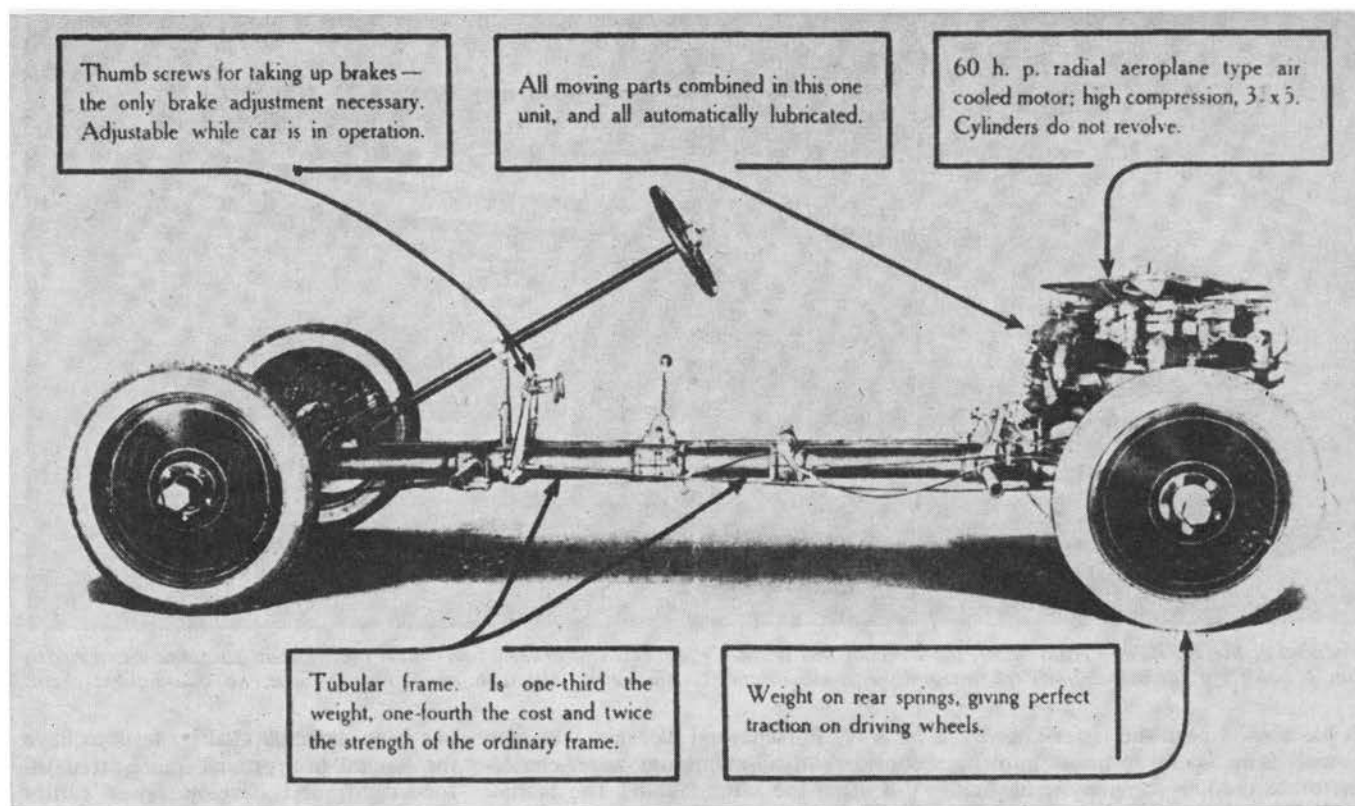
Since the flat-opposed aircooled rear engine has been pretty well exploited

The frame of the Monterosa was of pressed steel welded into a geodetic platform quite like several more familiar cars of today, and the method of suspending the rear axles appears identical to the trailing arms of the Corvair. Isotta-Fraschini engineers also tried to kick the habit of using steel springs. They designed molded rubber blocks whose size and shape caused a deflection rate so nearly ideal that only minimal shock absorbers were required. This particular angle might be a good one to work on; it's been forgotten since 1948.

A monocoque shell — in which chassis and passenger compartment are one unit with the skin bearing part of the load —

but shaped so that a great amount of strength was derived from thin cross sections. With today's heli-arc and stretch-forming processes to lean on, it should be possible to carry the silvery metal right over the roof.

De Lavaux built every component of his cars to his own ideas with the exception of steering wheel, tires, ignition and carburetion. We have mentioned in passing the cast wheels-and-brake drums, for greater heat dissipation, the rubber disc suspension and vapor-phase cooling which marked the car as outstanding. All of these examples are there for the taking. Vapor-phase cooling, used widely now in stationary engine indus-



THE 1922 JULIAN, A U.S. MARQUE, HAD A FIVE-CYLINDER ENGINE, SINGLE-TUBE FRAME, OTHER ADVANCED FEATURES WHICH FINALLY KILLED IT.

"So What Else Is New?"

continued

trial installations where trade-ins every two years aren't part of the plan, adds as much as 20 per cent to economy and prolongs unit life to an incredible degree, according to its proponents. Such an engine operates at a much higher and more efficient temperature than the 180° coolant we are accustomed to, and performs a self-cleansing function by vaporizing impurities out of the lubricant.

Using rubber in place of steel in suspension might effect a direct saving today and, if shock absorbers can be eliminated, further pare construction costs. De Lavaux's front suspension bears looking into, as does the cushion discs. His front axles were split and pivoted on big roller bearings at the center of the chassis. Rubber pads in torsion provided springing and the ride was acclaimed as both stable and soft on the rough roads of the period.

The Tatra's spinal column, referred to earlier, wasn't as sensational as the Pontiac Tempest's because the driveshaft was pretty ordinary. And the promotion department couldn't boast too loudly because the Austro-Daimler, a contemporary vehicle, had nearly the same design. Main difference was in the front of the tube which, in the Aus-

trian car, forked to become a conventional frame to support engine and semi-elliptic springs.

To get ahead, Tatra moved the engine to the rear and in 1934 introduced an aircooled rear-engined car (Did I hear you say that you own a Volkswagen, sir?) which is still being built in substantially the same form behind the iron curtain.

Even the Tatra was not the first to utilize this engine location. The VW, Corvair and others must certainly make a graceful bow in the direction of the Julian . . . an obscure American car of the early Twenties.

This single-tube-frame job mounted a 60-hp radial aircraft engine at the rear and claimed a gross weight of 2400 pounds. "Greatest power-to-weight ratio of any car manufactured," said the firm in offering its common stock to the public. A reduction of more than 500 wearing parts was also claimed along with 25-mpg economy and 30,000 miles to a set of tires. Brakes could be adjusted from the driver's seat, even while the car was in motion; and for the first time a phrase that was to be used much in the future was employed: "Passengers ride between the wheels, not over the axle." Naturally, it failed.

And, of course, the Corvair is not Chevrolet's first attempt at aircooling an engine. In 1923 the "copper-finned" model appeared. Its four-cylinder power-

plant had copper fins welded to cast iron individual cylinders cooled by a front-mounted fan and all-enveloping metal shrouds which could be opened for access to the engine. Using the then-prevailing normal 4:1 compression ratio, the engine's other portions were conventional except for duraluminum pushrods and open rocker arms running in graphited bearings. Mounted in the '490' chassis (the standard '23 model), several aircooled Chevys were transcontinentally tested and the project was quickly abandoned. The unequal cooling caused by the shortened fins where two cylinders abutted resulted in hot-spots and, along with other problems, brought the trial to an end.

The Pontiac Tempest engineers have shown great ingenuity in their use of the flexible driveshaft but the nod for the first modern transaxle must go to the 1927 Bugatti (derived from the 1890 de Dion, of course). The same design has been a Lancia mainstay for many years and has been used by both Ferrari and Maserati.

A number of currently successful imported cars depend on front-wheel drive and the economy of an engine-differential-transmission package: Auto Union DKW, Citroen, Morris and Austin 850 and so on. Ford Motors is known to be testing a front-wheel-drive car at this time and if a new "Miniford" appears on the horizon it will be interesting to

see how much it owes to Monsieur J. A. Gregoire.

Gregoire, in France, along with Harry Miller in this country, was an outstanding proponent of "traction-avant," pull instead of push. Whereas Miller's race cars dominated the Indianapolis 500, Gregoire's sports machines were winning top awards at the 24-hour Le Mans endurance events at the same time (1927-28-29).

Each man solved the tricky front-drive universal-joint problem in his own way but it was Gregoire's device that was accepted by Auto Union, and even by a number of American companies who built four-wheel-drive Jeeps and utility vehicles during World War II. Royalties from these uses made M. Gregoire wealthy but he has been unable to successfully market front-wheel-drive cars over a period of time — although his designs have been highly advanced.

In fact, a big, luxurious front-wheel-drive car would not seem to be at all a good venture in spite of the fact that the idea has had a large number of proponents (including, currently, one of

Detroit's 'Big Three') since the introduction of the Sizaire in 1922. The L-29 Cord and Ruxton, two American entries in the field, made their debut under similar circumstances in 1929. The Cord was an offshoot of the Auburn Co. and Ruxton was a Moon Co. subsidiary. Both parent companies were moderately successful independents but neither of the lush front-wheel-drive concepts added much more than prestige.

Cord drew on Miller's track machine designs for its front-drive layout and used the de Dion tube, a dead axle, to connect the two front wheels. The brakes were mounted inboard on the axle shafts rather than out on the wheels. The idea was good in the early '20s when first used by de Dion-Bouton; it is still being put into practice by Ferrari, Maserati, Devin and others. It is one of the best ways to keep both wheels on the ground under vigorous driving conditions.

Probably one of the most potent front-wheel-drive automobiles ever promulgated (and one whose fate can be guessed rather quickly) was the Buciacali, introduced in 1933.

In spite of the Italian name it was a

French car, and to say that it was the hit of the Paris Auto Show is a masterpiece of understatement. Get these specifications:

ENGINE — V-16, in a narrow vee, largely of aluminum and detailed like a Swiss watch. Supercharger, optional.

TRANSMISSION — Mounted transversely in front and driven through reduction gears for more silent operation.

SUSPENSION — Four-wheel independent.

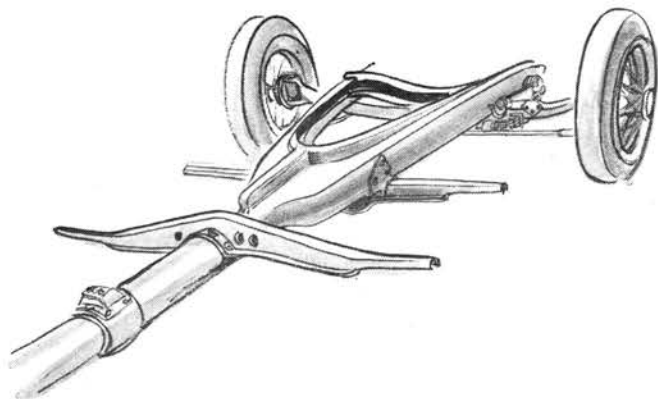
WHEELS — Cast aluminum, brake drums integral, finned for cooling.

BODYWORK — Custom. Brilliantly lacquered show models standing four feet high are the work of J. Saoutchik, leading French designer.

If one example of this far-reaching concept is in existence today it is in the nature of a miracle. Yet one would think that enough of the enthusiasts who raved over the show models would have appeared with money in hand to keep the plant's doors open.

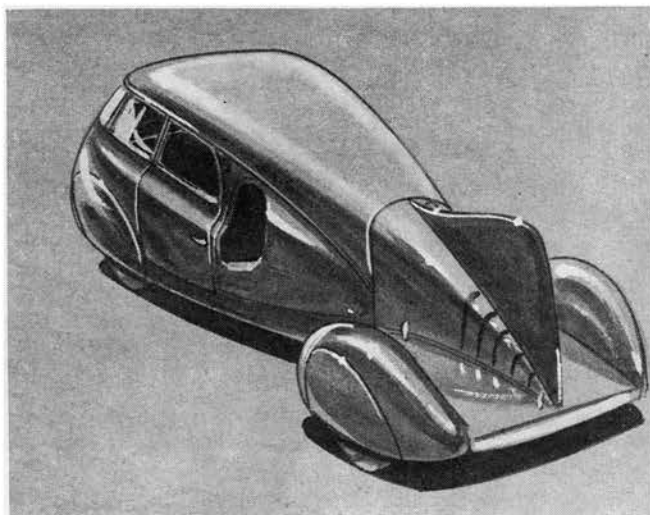
What were the wealthy people actually buying?

Hispano-Suizas, Minervas, Rolls Royces, Daimlers, Cadillacs, Lincolns, Packard 12's, Marmons, Lagondas —

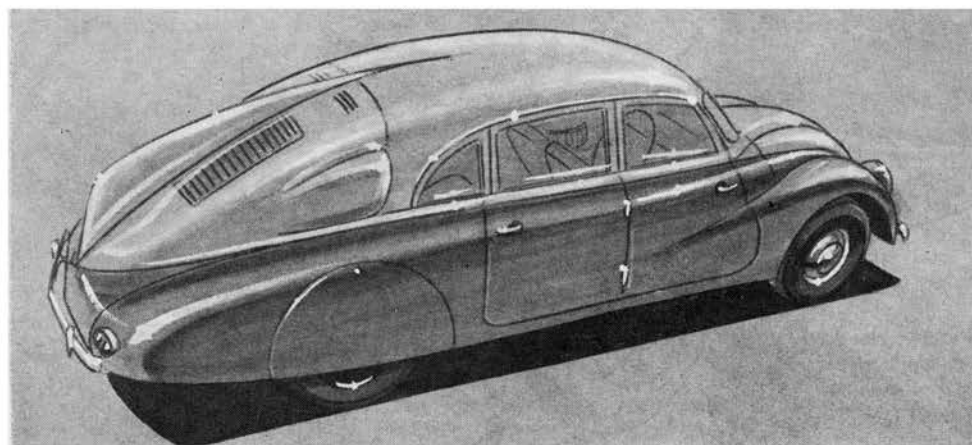


The Austro-Daimler was an early exponent of the tubular backbone chassis. Similar arrangements are on Tempest and Mercedes.

Illustrations by Joe Henning



Rear-engined and whale-like, the 1936 Du Bonnet used a stock Ford V-8 in an aerodynamic body. Top speed was 110 mph and gas consumption was much less than standard Ford. Driver vision was good except to rear. Two Du Bonnets were made.



The Tatra T87, almost identical today to its '34 prototype, had shape dictated by wind tunnel tests. Rear engine is aircooled ohv V-8, drives car to 100 mph.

"So What Else Is New?"

continued

nearly all highly conventional except the Marmon and Lagonda — and offering very little to the present-day innovator who is looking for something good to duplicate.

Oh, the Daimler did employ an extremely smooth hydraulic clutch but we already had automatic transmissions — the Reo Royale in 1931 presented this refinement — and the Lagonda used torsion bar suspension (later adopted by Jaguar and Chrysler), plus shock absorbers whose firmness could be controlled from the driver's seat.

Now, here's an item for your consideration: Certain shocks used in the '30s were able to think for themselves. The bumpy action of the road wheels pumped up pressure in a central fluid reservoir in proportion to the severity of the bounce. Smooth roads were automatically favored with a setting to damp out small vibrations, and a rough, rutted thoroughfare or persistent hard cornering produced its own appropriate rate. Overall settings were dash-controlled.

Might be good to bring back in a year or two.

However, the vacuum-operated fan belt expander that was a feature on the 1922 Leyland might just as well be considered a "miss."

Other automobiles relying on a convenience-factor to raise them out of the ordinary that can be counted among the missing today were: The SVG Vulcan with its electric gear shift (1913); the 1918 Enger Convertible Twelve — which could be operated as an economy six at the "slight shift of a lever;" and the 1917 Grant Six, offering a detachable hardtop.

Startlingly few buyers reacted to the Reeves Sextoauto or the same company's Octoauto (around 1912) which claimed superior riding qualities through the use of six and eight wheels respectively in place of the regulation four. "It's bound to revolutionize automobile construction," said a Sextoauto ad, but somehow the revolution never came.

The single headlight in the middle of the radiator shell re-introduced by Tucker in the 1940's failed to capture the acclaim necessary to make it a standard feature, just as it had failed twice before: in the 1913 Garford (later

absorbed by Studebaker), and the Briscoe. But we can thank Henry Ford for one innovation which has had a profound effect on American cars. Prior to 1908, when he announced the Model T, most automobiles had the steering wheel on the right. The T-bone's left-hand steering changed all that and its enormous popularity is credited with making that placement standard in this country.

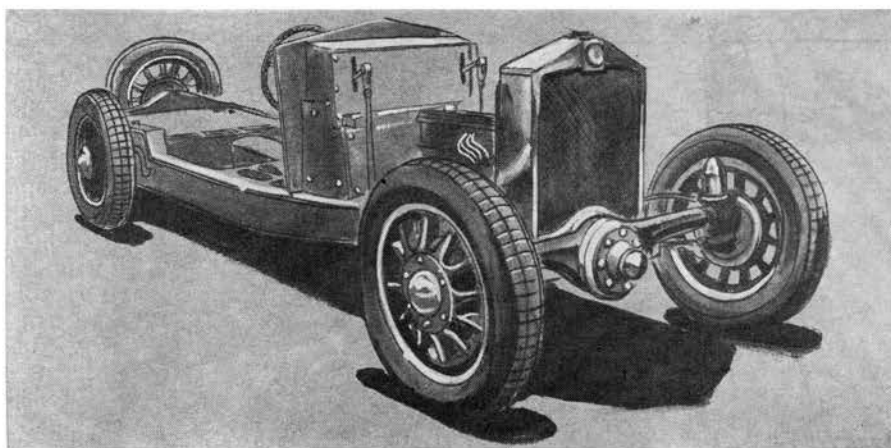
When it comes to styling the overall appearance of your car, be sure to observe the cardinal rule for success: plagiarize. Your new model should look so much like the others that no owner will feel conspicuous, yet it should have a distinguishing touch. This is a difficult goal and hundreds of people work at achieving it each year. Perhaps the best thing we can do is point out some pitfalls.

Don't, for example, make the mistake of letting form follow function and produce a streamlined car whose operational economy and top speed are enhanced by lowered wind resistance and which provides near-perfect all-around vision plus remarkable ease of entry and exit. To do so would be courting the fate of the Du Bonnet which appeared in 1936.

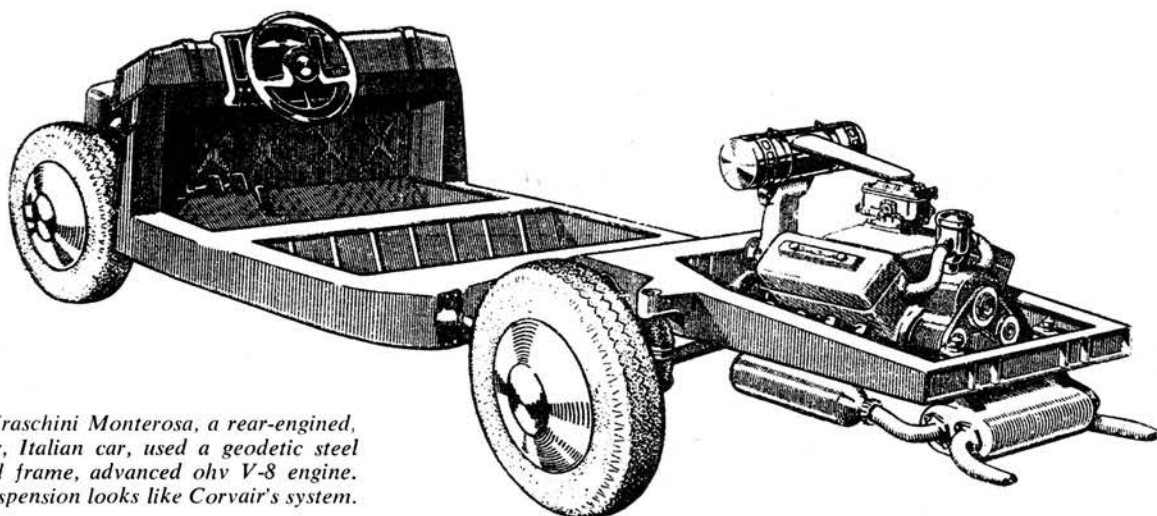
Using the same 85-hp V-8 that powered Fords that year in stock form, the Du Bonnet reached 110 mph and delivered 28 mpg. Compare this with the 75 to 80 top and 18 mpg of the standard Ford and it will be obvious why the car was a failure.

Actually, people thought it was ugly . . . but stand by. The merry-go-round is revolving and we may see it come past again.

Just keep in mind the slogan, "Make Haste Slowly" — and cash in! •



French Sensaud de Lavaux had cast aluminum frame with integral firewall and gas tank. Solid front axle pivoted at its center.



Isotta-Fraschini Monterosa, a rear-engined, postwar, Italian car, used a geodetic steel stamped frame, advanced ohv V-8 engine. Rear suspension looks like Corvair's system.