ENGINEERING

French Streamlined Car Will Run 53 Miles to the Gallon

Automotive Engineering Congress Also Hears Forecast Of Car of the Future With Bed, Plastics, Moving Seats

FRANCE now has a light-weight motor car which can do 53 miles to the gallon of gasoline when running at 30 miles per hour, it was reported to the World Automotive Engineering Congress by French engineers J. Andreau and Charles B. Brull.

At 50 miles an hour it will get 49 miles to the gallon of fuel and 39 miles to the gallon at 70 miles per hour. Even at speeds of 90 miles an hour it attains 27 miles to the gallon of fuel.

This car, a streamlined version of the popular Citroen, seats five people and has a top speed of 93.5 miles an hour. Compared with a stock car having the same motor the streamliner's performance showed half the gasoline consumption coupled with a 45 per cent. increase in speed.

Engineer Andreau is the designer who turned out the body of the famous "Thunderbolt" of Capt. Eyston which holds the world's land speed record of 357.5 miles an hour.

In cars with the new Andreau body the hissing of the wind against the body is completely suppressed, said Mr. Brull, and the driver loses this criterion of speed.

So efficient is the streamlining that the windshield remains completely clear. There is no frontal air pressure upon it to stick mud or insects to the glass panels. Rain drops run from the bottom to the top of the windshield and are instantly scattered so that no wiper is needed.

With this streamlining there is no sidesway due to lateral wind and the stability is so great that the steering wheel has true finger tip control.

The economies achieved with such streamlining, even at ordinary driving speeds, are the engineers' answer in Europe to the severe taxes on motor fuel and the cars.

The tax collector, Mr. Andreau indicated, is in fact the "chief engineer" of all motor cars in European countries. In France there are 15 taxes to worry the motor car owner and driver.

A forecast of the outward appearance of the automobile of the future, which includes movable light chairs instead of fixed seats, a roof covered in part with ultraviolet light transmitting plastic materials, concealed beds and air conditioning, was described at the World Automotive Engineering Congress by Edwin L. Allen of the Standard Products Company.

All this can be done without increasing the height and width of present cars and with only a slight increase in length.

"Streamlining will come eventually, not so much because of its practical value, but because it will be necessary to keep step with our future conception of beauty in motion. Since history began we have always envisioned a pointed arrow shape as indicative of speed. We know now that the arrow was pointed to pierce solid objects and not the air. Thanks to the airplane, the layman's conception of a fast moving object is gradually changing from the point in the front to the point behind. Sooner or later we must give this to him in a car if it is to have grace and indicate speed," Mr. Allen said.

Already the trend to streamlining has come up against the need for better vision in driving and in 1939 vision has won out, Mr. Allen declared.

The production of motor car body panels by pressing sheet steel in huge dies is a roundabout, makeshift method, Mr. Allen indicated.

"We carefully roll steel into a flat sheet and then proceed to wrinkle it up into intricate shapes. What a short cut it would be to inject the liquid metal directly into the finished form," he declared.

It might also be possible to make the body by spraying metal onto mantles and by successive applications build up steel bodies of suitable thickness, he added.

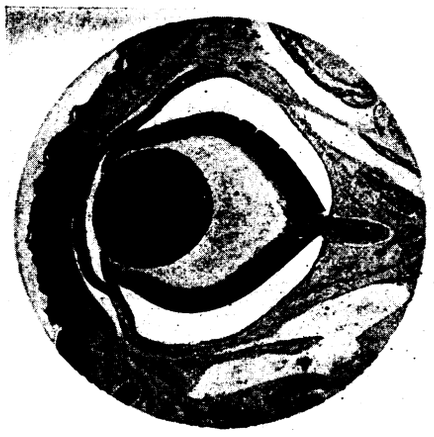
While the changes in the next twenty years in the appearance of the automobile will be many, they may not be as great as those of the previous two decades, Mr. Allen pointed out. Where the public used to be the restraining balance wheel on radical changes in design, the industry itself is coming to show this type of inertia.

Twenty years ago there were some 100 automobile companies each seeking novel designs. The bright ideas of their engineers and designers passed through 100 key executives who made the decisions. A careful gleaning of good improvements in designs each year quickly led to the adoption of the best features.

Today the designers are no less brilliant than they were then but their ideas are now put through a much smaller "funnel" in the minds of executives of a much smaller number of companies, Mr. Allen explained.

The production of a new model means retooling in vast plants and the expenditure of millions of dollars today. Automotive executives cannot afford to take radical chances in body changes with this much at stake. Twenty years ago the costs were much less, per company, and the pressure of competition in developing new advances in body design was greater. The fewer executives today are much more cautious.

Europe, where production is in a larger number of models and in much smaller quantities, said Mr. Allen, may



LIKE A DIAGRAM

The parts of the eye are usually pictured in diagrammatic form, but this low-magnification photomicrograph of an actual sagittal section of the eye of a very young mouse shows all the parts, from the closed eyelids (left) to the thick optic nerve, shown in longitudinal section as it passes into the surrounding tissues of the eye-socket. The large dark circular object is the crystalline lens. Both section and photograph were made at the Catholic University of America by the Rev. John W. Baechle, C. PP. S.

well be the most fruitful proving ground of public opinion for new body design.

Science News Letter, June 3, 1939

"Dope" Diesel Fuels

ENGINEERS and scientists are studying the increased performance of Diesel engine fuel when it is "doped" with acetone peroxide and ethyl nitrate.

The Dutch scientists J. J. Broeze and J. O. Hinze of the Royal Dutch Shell Laboratories showed that the addition of small quantities of these "dopes" makes the firing of the heavy oil in airplane Diesel engines easier. The molecules of the chemical dopes are easily activated and make the combustion of the charge of fuel in the cylinders occur more easily. Aim of the investigation is to retain the safety features of a heavy Diesel fuel and yet raise its firing characteristics.

Science News Letter, June 3, 1939

MEDICINE

Use Television Techniques To Detect Heart Ailments

A NEW kind of electrocardiograph machine using television principles, which will enable doctors to see the record of the patient's heart action instantaneously without waiting as is now necessary for a photographic film to be developed, has been devised by Dr. George Walker of the University of Kansas School of Medicine.

The familiar wavy line record is traced in bright green by a bright moving dot on a screen which is both phosphorescent and fluorescent. The moving dot comes from a stream of electrons from a cathode ray tube.

The machine is expected to save both time and money in getting records of heart action, important for diagnosing about 40 heart conditions.

It can be operated from any electric light socket in either hospital, office or home. It is not yet available commercially. The principle of this new machine has been adapted to use with the standard electrocardiograph machines now in use. This phase of the work was done by Dr. Graham Asher of the University of Kansas.

The exhibit of these machines, shown by Drs. Asher, Walker and Frank Hoecker, at St. Louis, was awarded a certificate of merit by the American Medical Association.

Science News Letter, June 3, 1939

Portugal rules colonies totaling 26 times its own area.

PHYSICS

Metal of the Future Has Extraordinary Stiffness

Beryllium, Now Very Scarce, Would Revolutionize Industry and Aviation If Ever Found in Large Quantity

WRITE this down in your future book: a metal not one person in ten thousand will ever see in pure form outside a museum and whose name you may never have heard is promising to improve the machines of our industries during the next decade.

Speedier, sturdier and safer airplanes driven by far more powerful motors; cheaper and safer machine tools; longer-lasting springs—these and hundreds of other boons may soon be conferred on twentieth century civilization by this metal.

Its name is beryllium. Though its commercial exploitation goes back not many years and its intensive study in the laboratory dates but to the post-war period, already it has aroused man's cupidity and a bitter international battle for its control, with ramifications reaching into the governments of a half dozen major powers.

It is being put into alloys whose performance makes beryllium a strategic material in the World War that has not yet begun, even though the amounts of beryllium in use must still be measured in pounds instead of tons.

A watch made of two alloys containing beryllium was dropped from an airplane 3,000 feet up. Only the crystal broke; the watch continued to run. Properly used springs made of one of the alloys have never broken or worn out from fatigue. Engine parts made of it can operate consistently at temperatures that would ruin the temper and shorten the life of any material now in use.

Beryllium is light and exceedingly hard. Added to other metals, it confers on them hardness and strength, turns soft copper into a ruddy alloy as hard as tool steel, with nickel makes an alloy as tough as the toughest steel and much harder. Some beryllium alloys laugh at corrosion as well; they are more rust-resistant than stainless steel.

A Frenchman, Vauquelin, found beryllium in 1798, but because it is difficult to extract from its ore, it remained a curiosity for a century and only the dreamer ever imagined it would some day become an object of painstaking attention. A decade ago, its price was more than $100 per pound of beryllium in the form of a master alloy with copper. Today the four per cent. beryllium master alloy sells for $15 a pound of beryllium —actually about 25 pounds of metal.

Beryllium is the fourth lightest element, only the gases hydrogen and helium, and a still lighter metal whose violent reactions with water make it unusable, lithium, coming before it in the periodic table. Though it is hard and takes a high polish and melts only at a high temperature, it is extremely brittle.

Beryllium copper, containing two per cent. of the new metal and, in some cases, a small percentage of nickel, is the beryllium alloy most widely used so far in the United States.

But in Germany, the giant Siemens-Halske firm has made an alloy of two per cent. beryllium and the rest nickel.

STRENGTH TEST

Beryllium is submitted to tests of tensile strength at the National Bureau of Standards. It is strong, but so little is available that even test samples are below standard in size.