Autos Should Be Seen and Not Heard

Automotive Engineering

THE birdies that sing in a car, "Squeak! Squeak!" are so irritating to the majority of drivers and passengers as to suggest that radical changes in automobile body and chassis construction are needed. This possibility for improving automobile riding comfort was brought strikingly to the attention of the Society of Automotive Engineers at their 25th anniversary meeting in a report by Prof. G. C. Brandenburg and Prof. Ammon Swope, of Purdue University.

These two professors are engaged now in an investigation of riding comfort. They reported that they have started out by asking 125 young men and women to rate their feelings on a variety of automobile riding qualities which might involve discomfort.

Body noises were particularly denounced by the raters. Their verdict throughout the list of possible automobile annoyances, emphasized the feeling that an automobile should be seen and not heard. Squealing brakes, the roar of a car, noise from wind, tire noises, and those baffling unidentified sounds that haunt a car were all termed objectionable by a large percentage of the raters.

"The comfortable qualities in riding are often mental," the report stated. "Fatigue may be due to these mental qualities as well as bodily discomfort."

The sensation of riding up and down as you advance is uncomfortable to about one person in three. A good many of the raters said that swaying motion was nauseating to them. Women are more sensitive to this trait in a car than are men, the report indicates.

The great majority of the men said they preferred to do their own driving. Almost fifty per cent. of the women, on the other hand, felt most comfortable in a car when some one else held the wheel.

The speed most enjoyed in road travel was given as 42 miles an hour average, and there was no significant difference between men and women on this point.

AN electro-magnetic automobile brake that enables drivers to stop speeding passenger cars and heavily loaded trucks by the mere throwing of a switch was described by John Whyte, of Beloit, Wis.

The brake operates on a car's storage battery. The switch is connected to the foot pedal, so that the driver performs the same operations he would with a mechanical brake but at the cost of practically no effort. Wires instead of rods run to the brakes on each wheel. Their action was said to be uniform at all times and adjustment for wear unnecessary.

THE most universal substance in the world, unseen at all times and unfelt except when the wind blows, is keeping automobiles from running faster.

When cars travel above 40 miles per hour more power is required to overcome air resistance than road resistance, Prof. Felix W. Pawlowski, of the University of Michigan, pointed out.

"At a speed of 50 miles per hour the wind resistance of the usual motor car is between 110 and 170 pounds," said Prof. Pawlowski, "absorbing between 15 and 23 horsepower of the engine out-put. At 100 miles per hour these figures would be quadrupled."

Besides increasing speed, streamlining automobiles would have the advantage of not stirring up dust clouds on gravel roads. These dust clouds visualize very well the character and size of eddies produced by cars.

AUTOMOBILES having no ignition system and averaging 25 miles on a gallon of six cent crude oil are not far distant. A Diesel engine which accomplished these economies was recently operated successfully in a seven-passenger sedan and a roadster, C. L. Cummins, of Columbus, Ind., reported.

The widespread use of the engine depends on additional technical perfection, experts say, which should be accomplished through scientific research during the next few years. In Europe where the cost of gasoline is very high, the Diesel engine is already being applied to trucks and motor buses.

Mr. Cummins announced plans to put such an engine on the market in America. It will compare favorably with present day standard gasoline engines in truck and bus service, he said, and should carry the Diesel engine into the automotive field very fast.

The engine used in the sedan and roadster was designed primarily for marine service, but after being adapted to the automobiles it performed unusually well. During the entire 6,000 miles the sedan was driven, its performance was practically the same as with the standard equipment originally used. The only noticeable difference was a little sluggishness in the pick-up from zero to 20 miles per hour. Top speed was 55 miles per hour.

The same engine in the lighter car made a speed of 88 miles per hour and acceleration was better. It took four passengers up Lookout Mountain at Chattanooga in high, except over two rough spots.

In spite of this excellent performance much development must be accomplished before the Diesel will be suitable for use (*Turn to page* 350)

The Answer Is

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Rare Intisy Rubber Tree—*Continued*

long, thin, switch-like green-skinned branches all naked. The whole growth comes to resemble somewhat a gigantic inverted broom.

The intisy rubber tree is unique among all rubber-producing plants in that its milky sap, or latex, yields rubber of very high grade directly, without the troublesome dipping and smoking of the primitive Brazilian process, or the more modern chemical treatments used in the East Indies. All that the natives needed to do was cut a long gash in the rind of the tree and let the latex ooze out. When they came back the next day there would be a strip of pure rubber, in consistency almost like the rubber bands on your desk, lying stuck in the cut, and all they needed to do was take hold of one end and pull. They wound these long strips into balls and took them directly to market. It was the simplest from of rubber collecting that has ever been practiced.

But it was also the most destructive. In their eagerness to get the longest possible strips, the natives cut gashes spirally round every branch on every tree they could find, and this drastic girdling usually resulted in death after one "bleeding." The rubber production of the island, which had jumped to nearly a million pounds a year after the discovery of the intisy brush, dwindled again to almost nothing.

One thing that probably helped the persecuted plants that survived the massacre to carry on was the thoroughness of their adaptation to desert life. Real desert plants are usually organized to offer stubborn resistance to desperate environments, and the intisy is one of the best-organized desert plants known. Its leafless, switchlike stems, coated with wax, yield very little water to the demands of the arid air, and the gum that forms in every wound effectively stops bleeding of sap. Finally, intisy has one of the most efficient of water reservoirs, stowed safely underground, in its roots. Dr. Swingle states that no other plant has anything quite like it.

Each root is thickened in a series of sausage-like swellings, and practically the whole of the enlargement consists of water. The water is stored in swollen-up cells with which each "sausage" is filled. It is good water, too—the very slight "planty" taste did not deter Dr. Swingle and his party from slaking their thirst on these roots, in preference to the very poor drinking water usually obtainable at the desert water holes. He has given the structures the special name "hydriarhizas," which means "water-jug-roots."

It is these peculiar water-jug-roots which enable this plant to live in a country subjected yearly to a six-months drought, and where sometimes no rain falls for as many years.

Twenty of the original plants which Dr. Swingle dug in Madagascar survived the 10,000-mile trip, and thirty cuttings were rooted from these plants last summer. All of these original plants are growing, hence the total nursery stock now amounts to fifty specimens—possibly the most valuable lot of fifty plants now in America. Several of the water-filled roots which he also brought are still alive, but they have not put forth any shoots or leaves. Apparently the roots lose the power to produce stem-buds when they swell up and gorge themselves with water, if indeed the roots of this plant are capable of producing stems.

Most of the young plants are still growing in the greenhouses of the U. S. Department of Agriculture at Washington. They are being used for propagation, to increase the number of plants as rapidly as possible, and it is expected that several hundred rooted plants will be obtained during the present season.

However, a few have already been set outdoors, to test their possibilities. Two are at an experimental planting ground of the Department of Agriculture near Miami, Florida. This is a habitat with very much greater rainfall than the native home of the intisy; but it is always worth while giving a new plant a chance in a different setting, to see whether it may not possibly thrive better in a strange world than it did at home.

Two other plants have been set out near Yuma, Arizona, and two more on Torrey Pines Hill, near San Diego, California. The climatic conditions of our Southwest are very much like those of southern Madagascar, except that the winter temperature is not quite so high. It is therefore most probable that the new rubber tree will find its most congenial home on the wide plateaus south of the Colorado river and on the dry foothills and coastal country of California.

The one question still unsettled is whether the intisy can stand the light winters of this region. If it has even a little frost tolerance its range in the United States will be greatly extended. It is known that light frosts sometimes occur in part of the region where intisy naturally grows, but these are very light indeed and very seldom. Perhaps intisy will have to be entrusted to some of our neighbors to the south, such as Mexico, or the leeward side of Haiti, Porto Rico, Jamaica, etc. In either case, it will be comforting to have a rubber supply either on our own territory or on that of a friendly neighbor not separated from us by a wide sea that might under conceivable circumstances some day be closed to us.

There is no possibility of getting a hurry-up crop from intisy, such as Edison envisages as an emergency rubber supply from goldenrod. It is a higher-grade rubber plant than goldenrod, but a much slower grower.

Even if intisy proves adapted to American climate, and notwithstanding the extremely high quality of the rubber which it yields, it is quite possible that it might not prove commercially feasible for plantation methods of growing. If such proves to be the case, Dr. Swingle has suggested that a large acreage of this plant might be set out in the Southwest on tax-free land, leaving it to look out for itself until some day when it might be badly needed.

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Diesel Engine—*Continued*

in the ordinary passenger car. Its cost and weight must be reduced and it must be made more flexible.

The Diesel has been used primarily in small stationary power plants, locomotives and ships. Its weight per horsepower has been many times that of the automobile engine and its speed constant and slow.

Research has accomplished much toward making an automobile power plant out of the original slow moving monster. In fact, several airplane engines have been developed, but their economies of weight cannot be applied to the automobile because they are radial type motors.

In high-speed Diesel engines, crude oil is injected into the cylinder just as it is needed for explosion. It is finely atomized as it enters through a minute hole under a pressure of thousands of pounds per square inch. Ignition is caused by the great heat of compression.

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