

"If this is possible," said Mr. Short, "the supercharger would not only provide greater power from the same displacement of the motor, but also greater flexibility, the lack of which in the present engine is the limiting factor in the utility of the internal-combustion engine. If this can be achieved, it would mean the modification of the transmission, which is the most undesirable part of the automobile."

An engine has been produced recently in Germany, he stated, for marine use which ordinarily develops 6,400 horsepower, but by use of an electrically driven compressor the power can be increased to 7,800 horsepower, an increase of about 22 per cent.

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#### ACTUAL RUBBER SHORTAGE SEEN FOR 1930

The world's demand for crude rubber will exceed the supply by 37,000 tons in 1930 unless some plan of relief is adopted. This future shortage, which is actual, is troubling Congress almost as much now as the artificial shortage brought on by English restriction of rubber exportation which makes the price so high at present.

In hearings now being conducted by the Foreign and Interstate Commerce Committee of Congress to investigate the high price of rubber, Paul L. Palmerton, chief of the rubber division of the Department of Commerce, brought out that there were four methods by which Americans might combat the high prices caused by the present artificial shortage. One was a campaign for a more conservative use of what we have, making it last longer.

Substitutes were another possibility. Reclaimed rubber, although lacking some of the qualities of fresh natural rubber, could be mixed with new rubber in certain proportions for the manufacture of some articles wherein natural rubber had been used almost exclusively in the past.

In certain places, such as in the treads of tires, the use of reclaimed rubber decreased the durability. Tests on tire treads have shown that up to a certain point the durability is decreased regularly as the percentage of reclaimed rubber is increased.

Synthetic rubber has been unsuccessful commercially so far, although Germany, during the latter part of the war, was producing 150,000 kilograms of synthetic rubber per month. It is costly to produce and lacks elasticity, but it serves quite well in the manufacture of hard rubber products.

The stimulation of production of wild rubber in the Amazon Valley was another suggestion made by Mr. Palmerton, and the fourth was cooperative buying.

In view of the actual shortage which is prospective for us, he estimated that a million to a million and a half more acres of rubber need to be planted upon plantations of our own. Rubber trees do not begin to bear until 5 to 7 years old and full bearing is not obtained until 8 to 10 years old, so trees planted now cannot hope to affect the prospective shortage of 1930 but they can

provide for the more distant future.

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#### HOME GROWN RUBBER TRIED OUT BY GOVERNMENT EXPERTS

All the schemes to take a belated stitch in the American rubber dilemma which resulted when Great Britain pulled in her supply are beset by difficulties. One of the least known of these schemes, although not necessarily the most unpromising, is that for growing rubber right here at home, under the semi-tropical sun of Florida and California.

The U. S. Department of Agriculture has been trying out seeds and plants of various rubber-producing species in experimental gardens, but as it takes a long time for the plants to mature and produce latex, officials have as yet no information to give out, and they are advising enthusiastic investors not to put any money as yet into Florida or California rubber.

Botanists name a long list of plants which will produce the milky sap containing rubber. The most important of these today is the Para rubber tree, *Hevea gulanensis*. It grew originally in the Amazon Valley but was bootlegged out more than half a century ago by British planters who tried it out in Kew Gardens, London, and in Ceylon, to see if it would grow outside of Brazil. Then it was used to start the vast plantations in the East Indies that are now supplying the world with most of its rubber.

"Healthy seedlings of the Para rubber tree have been grown at the U. S. plant introduction gardens near Miami, and are being transplanted to different conditions of soil and exposure," Dr. W. A. Taylor, chief of the Bureau of Plant Industry, stated in his annual report to Congress. "The collection of rubber plants now growing at Miami includes altogether about twenty different types.

"Rubber plants that are natives of dry regions are being tested in California, in the coast regions as well as in the interior valleys," he continued. "Several dry-country rubber plants are known in Mexico, while others are reported in South America, Africa, and Madagascar. The production of rubber from the Mexican guayule plant has been investigated by a private corporation and the stage of agricultural practicability is believed to have been reached in California.

"Desert types of rubber plants are being grown in the lower valley of the Colorado River, and the possibilities of one of the common milkweeds are being studied because it grows well on waste lands and produces a large quantity of rubber-bearing material readily and cheaply. Cultivation might extend over large areas if ways of utilizing the substance were perfected.

"This plant is widely scattered in southern Arizona and the desert regions of Sonora and southern California, and it also grows in small ravines and gullies of barren hillsides a few miles from the coast of Lower California. Some of the plants grow so large that they form dense masses more than six feet high and ten feet across."

If any of the rubber-bearing species does show a willingness to produce