power. In these respects, he declared, widening the rim should have effects closely corresponding to increasing the inflation pressure.

"As far as the tire is concerned, the major, if not the only, discernible betterment of wide-base rims is that of treadwear," he said.

Speaking of the disadvantages of wide-base rims, he brought out that, by stiffening the tire and reducing its deflectability, widening the rim causes a harder, harsher, or joltier ride unless the inflation pressure is decreased sufficiently to give an equivalent ride. He pointed out that this pressure differential, believed to be necessary from considerations of ride, partially offsets the treadwear and stability advantages of wider rims.

Dr. Sidney M. Cadwell, of the U. S. Rubber Company, said that his company's tests had "shown that the wide-base tire and rim combination will perform somewhat better for: tire cord fatigue, tire rim bruise resistance, tire groove cracking resistance; would perform equally well for: tire heat dissipation up to 75 mph, tire power consumption, tire tread and fabric separation, tire sidewall breaks at the rim, tire squeal on turns, and tire noise or hum on straight roads; but would be inferior for: tire ride, tire harshness, pavement seam bump absorption, tire and car parking effort, rim curbing, and tire tread shoulder cracking.

"We approve the use of tires on wide-base rims," Dr. Cadwell concluded, "if the combined efforts of the car and tire engineers to re-balance the changed tire performance properties results in future cars of at least equal comfort and safety."

Science News Letter, January 18, 1941

Cooling Aided With Enamel

CONTRARY to an idea that coatings of paint and enamel act as insulators and keep heat in cylinders of airplane engines so treated, the coatings actually increase their rate of cooling.

This fact has been brought out in experiments made by Dr. Myron A. Coler, technical director of the Engineering Products Division of the Paragon Paint and Varnish Corporation.

Many factors entered into the cooling efficiency, he found. The color of the enamel proved important. One that was clear raised the cooling rate as much as 13%, though even a black enamel produced an improvement of 7%.

Another surprise was found in the effect of more than one coat.

"If the coating material functioned as a simple insulator, we would naturally expect the cooling efficiency to drop with increasing coat thicknesses," said Dr. Coler. "However, it must be remembered that the properties of such materials in the form of thin films may differ considerably from those of the same materials in massive forms."

While a layer of asbestos paper around a test cylinder reduced the cooling by 4%, one coat of enamel increased it 13%, two coats 20%, three coats 23% and four coats 24%.

Science News Letter, January 18, 1941

Leaner Mixtures Save 18%

LEANER air-fuel mixtures in modern automobile engines, as compared with those of 1927, have produced a saving of about 18% in fuel consumption, members of the Society of Automotive Engineers were told by a research quartet from the General Motors Corporation's Research Laboratories.

The group, comprising W. G. Lovell, J. M. Campbell, B. A. D'Alleva and P. K. Winter, commented that the air-fuel ratios used in automobiles are of special interest as representing the engineering compromise that must be made between the relatively lean mixtures which are desirable from the standpoint of economy of fuel, and the richer ones which are necessary because of inherent imperfections in commercial induction systems.

Comparisons of mixtures used by the cars tested in the three years were shown on graphs showing average and range of air-fuel ratios plotted against miles per hour at road load and full load, and percent of energy loss plotted against miles per hour at road and full load.

Science News Letter, January 18, 1941

Danger in Special Oils

DEFENSE may be endangered by the number of special oils that have been developed to meet the demands of a particular engine, class of design or service, R. J. S. Pigott, of the Gulf Research and Development Company, suggested.

In the past five years, he said, a situation has developed that "economically, is thoroughly unsound."

Charging that chemists have been called in to solve problems that really belong to the engineer, he stated that the chemist should be a last resort.

"A considerable number of oils have been developed," he declared, "which show improvement in some desirable characteristic, but by no means in all. Further, these oils generally work in a particular engine, class of design, or service, much better than the earlier oils; but in no case of which we are aware do they fit all cases. For example an oil with additives to suit one design of diesel engine may not be satisfactory in another design, nor serve for heavy-duty gasoline engines (truck and bus service). At the same time many diesels and many heavy-duty gasoline engines are getting along perfectly well on high-grade, straight mineral oils.

"It looks as if the program is getting to be prescription oils for too many cases. Look at the defense situation a moment. The Army and Navy will want not over four oils for *all* engine purposes, and they would be glad to use less. How can they possibly handle 15 or 20 prescription oils for particular designs?

Turning to fuels, Mr. Pigott pointed out that during the past 10 years the improvement in engine horsepower has been 20% due to increase in compression ratios following improvements in octane rating of gasoline, and 80% due to straight engineering design. If high horsepower is desired, he stated, supercharging is a good way to get it without going to synthetic chemicals for costly high octane gasoline. It costs millions, he said, to increase octane number a couple of points. He suggested that if supercharging is adopted "full intercooling should be used to cut down work for compression, lower terminal temperature to ward off detonation, and deliver a denser charge for high horsepower."

Science News Letter, January 18, 1941

CHEMISTRY

Strings for Racquets From Synthetic Fiber

STRINGS for racquets used in tennis, badminton and other games are now made of the same synthetic fiber that has become so popular for hosiery. Nearly a sixteenth of an inch in diameter, one of the "giant" strands, used for the new strings, is as much bigger than those used for stockings as a ship's hawser is bigger than a piece of package cord. Tests show the synthetic strings to be exceptionally durable and indifferent to the effect of water. (*E. I. du Pont de Nemours and Co., Arlington, N. J.*)

Science News Letter, January 18, 1941