that the use of a coal dust motor may come into vogue. Experimental work is being conducted with some success by German manufacturers on the Diesel engine using coal dust. In fact, Diesel's original idea was to use powdered coal fuel, and after all these years, this expedient may after all become a solution.

SYNTHETIC GERMAN PETROLEUM MAY SOLVE MOTOR FUEL PROBLEM

A new method of cheaper synthesis of a high grade motor fuel in Germany may go far toward the solution of the motor fuel problem in the future. The Berlin professor, Franz Fischer, who recently devised means of making liquid fuels synthetically from coal products, has now simplified his process so that he can dispense with costly high pressure apparatus that has stood in the way of its commercial development.

The new method produces a pleasant smelling gasoline as clear as water and one which will not harden or become gummy on exposure. The gasoline is highly volatile and is largely made up of unsaturated compounds like olefines which impart to the gasoline valuable anti-knock properties. This enables it to be used in efficient high compression motors without objectionable knocking and with great economy.

A number of valuable by-products may help to put the process on a sound commercial basis in the future. Certain substances of high boiling point condensing to heavier oils, may by the use of catalyzing agents be changed to hard paraffine. The purified crystallized substance could be used in the manufacture of candles and other paraffine products, it is claimed.

Semi-coke, a new indu try by-product for which a commercial use has not yet been found, may be used as the basis of synthesis of this new gasoline. Semi-coke is left over in the low temperature carbonization of coal in the making of tar oils. In the Fischer process water gas from which the new liquid fuel is condensed can be made from coke or semi-coke, and the latter, it is claimed, would be an ideal starting material.

Coke and coal are almost completely gasified when steam is led over them at a high temperature, and water gas, a mixture of carbon monoxide and hydrogen, is formed. If this water gas could be entirely transformed into liquid motor fuel, the problem of the wasteless transformation of solid coal into liquid fuel, the dream of the modern chemists, would be accomplished.

The Badische Analin und Soda Fabrik first succeeded in commercially synthesizing liquid fuels from this gas mixture in Germany by means of Dr. Fischer's early method, in which pressures of 1500 pounds per square inch or more were employed. By his new process, however, Prof. Fischer has succeeded in synthesizing gaseous, liquid and solid carbohydrates from carbon monoxide and hydrogen at ordinary pressure. Hitherto all reduction of carbon monoxide without pressure yielded methane, but Fischer found that by using an ironzinc oxide catalyzer more complicated products were formed. Other metals and their compounds were studied and a cobalt chromium oxide mixture was found to stimulate the formation of gaseous, liquid and solid carbohydrates, when heated to about 518 degrees Fahrenheit.

The carbon of the carbon monoxide is said to be made into carbide by the metal,

and the carbide then split by the hydrogen in the gas mixture. As a result the metal is regenerated and carbohydrates are formed.

In the old Fischer method a large proportion of the synthetic products formed were highly oxidized, but in the new normal pressure process they are unoxidized. Prof. Fischer found that if the temperature was raised the formation of higher carbohydrates stopped and methane was again formed.

NONKEY HOUSE HAS ALL HODERN IMPROVEMENTS

A palatial concrete and glass establiehment for monkeys that supplies every simian comfort possible in a chilly northern clime is a recent addition to the equipment of the Pasteur Institute.

Experimental work on the types of animals most nearly approaching man is a first requirement of nearly every piece of research that helps to find some new means of cutting down the toll of disease. Unfortunately monkeys transported from the tropics to an alien environment pick up so many intercurrent infections that precise and accurate medical work with them is exceedingly difficult.

The new building in the grounds of the Pasteur Institute was built under the direction of Dr. Albert Calmette, whose tuberculosis vaccine has attracted wide attention in medical circles, and is especially designed to overcome monkey susceptibilities to disease. Funds for its construction were donated by the Princess Marie of Greece in honor of her father, Prince Roland Bonaparte, himself a friend and patron of scientific endeavor.

Dr. Calmette has made a close study of simian needs and believes that if monkeys are to be kept alive in the midst of northern civilization their living condition should approximate as closely as possible their natural habitat. Peanuts and bananas are not the only things monkeys should have to eat, circuses and zoos notwithstanding, according to Dr. Calmette.

Two big blacks from central Africa where the Pasteur monkeys were collected, act as cook and valet decchambre. One burly African in the model kitchen at one end of the glass enclosed building prepares menus as well balanced as any self-respecting chimpanzee would steal for himself in the depths of the Kongo.

Each ape has a roomy chamber enclosed completely with glass or screen, as the weather requires, except for a small window in front. Radiators located midway up the wall keep the atmosphere at jungle temperature, while an elaborate ventilating system, running water and a system of perches and swings that would do credit to any playground help to make urban home life an attractive substitute for a precarious struggle for existence in central African wilds.
