The poisonous effect of the high nitrate water results, Mr. Weart explained, from the conversion of the nitrate into nitrite by bacterial action in the intestine. When absorbed into the blood the nitrite changes part of the hemoglobin, the oxygen-carrying chemical that makes blood red, into methemoglobin. This is an inert chemical that does not transport oxygen to the tissues. The blood becomes chocolate colored and the skin turns slate gray. Although the baby's appearance is alarming, its breathing and circulation may be relatively normal. But if the acute cyanosis persists general damage and death may occur.

Besides changing the drinking water, treatment of the baby with either a blue dye, methylene blue, or with vitamin C, is said to bring dramatically prompt recovery.

One reason only infants seem susceptible to the ailment is that they have much less functioning hemoglobin than adults. The effect on older babies and children of continuing to take large amounts of nitrates is not positively known, but it may deplete them of vitamin C. Lack of this vitamin results in scurvy.

Science News Letter, May 1, 1948

CHEMISTRY

New Food-Saving Varnish

➤ THE world's first completely synthetic varnish, made from petroleum, promises to add to the world's food supplies by replacing paints and varnishes now made from edible vegetable oils.

The new type varnish prepared from a new petroleum chemical, glycerol allyl ether, was announced to the American Chemical Society meeting in Chicago by chemists from the Shell Development Company, Emeryville, Calif.

Insoluble films, hard to hurt with chemicals and resistant to scratching, are formed by the new varnish. It is made in several chemical steps from propylene gas, which is abundantly available from cracking oil.

Manufacturers are expected to apply the new varnish where they now use resins made from a combination of synthetic materials and scarce natural drying oils.

Linseed oil, soybean oil and cottonseed oil, which can be used as food, have been used as major ingredients up to now of so-called synthetic paints and varnishes. The new varnish is one of several attempts to replace some of the scarce vegetable oils with synthetic products made from more available non-food materials, such as crude oil.

H. Dannenberg, T. F. Bradley and T. W. Evans were the Shell chemists who did the research.

Science News Letter, May 1, 1948

ENGINEERING

Need for Coal Stressed

➤ MORE coal from American mines will be needed and the amount will rapidly increase during the next decade, the American Mining Congress was told at its meeting in Cincinnati by Dr. John I. Yellott of the Locomotive Development Committee, Baltimore. The reasons, he stated, are a deficiency of fluid fuels, large coal exports, and the interchangeability from a chemical standpoint of coal, oil and gas.

The major increases in the nation's fuel requirements must be met in some manner from coal, he declared, because the fluid fuels are rapidly approaching the point where their use will be restricted to applications, particularly automotive, to which coal is inherently unsuited, and for which fluid fuels are virtually essential.

Industrial activities are increasing, and new housing is needed for a growing population. These new demands can not be met by oil or gas, and they must be satisfied by and with coal. Industrial and institutional coal customers can be retained, however, only by improvement both in equipment and in coal quality.

A coal-burning gas-turbine locomotive, now designed after three years of experimental work, was described by Dr. Yellott as one of the improved methods of using coal with a high degree of efficiency. Very finely powdered coal, pulverized on the locomotive, is forced into the combustion chamber mixed with compressed air. It is burned in suspension within an air-cooled combustor, and the heated gases, with fly ash removed, will run the gas turbine, which in turn will drive electric generators.

The coal-fired gas turbine will have a wide field of use in stationary plants as well as in locomotives, he declared. The gas turbine is the first power plant which can exceed 25% in thermal efficiency without using a drop of water. An immediate application will be in supplying power for coal mines, which must now purchase power because they have no water for boilers and condensers. The gas turbine will free the power engineer from bondage to the boiler, and it will enable him to locate his power plant where he wants it, rather than near a water supply.

Science News Letter, May 1, 1948

One *birth* in 89 results in twins, one in 8,846 in triplets, and one in 599,921 gives America new quadruplets.

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