

## CHEMISTRY

# New Solvents May Bring Revolution in Paint Industry

## Nitroparaffins Are Made By Treating Constituent Of Natural Gas With Nitric Acid; Have Little Odor

**A** REVOLUTION in paints, varnishes and lacquers is in the making, comparable with the great and rapid changes wrought a few years ago by the introduction of cellulose lacquers, which made the world a decidedly brighter place to live in. The new revolution in protective coatings is being brought about by a new class of solvents, known as the nitroparaffins, which were described before the meeting of the American Chemical Society in Memphis by Dr. Charles Bogin and Dr. H. L. Wampner of Commercial Solvents Corp., Terre Haute, Ind.

The nitroparaffins are made by treating one constituent of natural gas, propane, with nitric acid. There are four of them, known respectively as nitromethane, nitroethane, 1-nitropropane and 2-nitropropane. They are all excellent solvents for a number of coating materials, including the cellulose compounds, the rubber-like vinyl compounds, rubber itself, and natural shellac.

From the user's point of view they recommend themselves in several ways. They have only a little odor, and that not disagreeable, contrasting favorably with some of the solvents in present use. They are less inflammable than many of the present solvents, and are relatively non-toxic. They dry out at a moderate rate, permitting ready spreading but not staying wet too long after application. Finally, they permit less complex mixing formulas, so that costs of production should be lower.

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## Riboflavin Concentrated

**A** DISCOVERY that should have the doubly desirable effect of reducing the cost of one of the most important vitamins and at the same time finding a use for what is now one of the most nearly useless of dairy byproducts was reported to the meeting by Dr. A. Leviton of the Bureau of Dairy Industry, U. S. Department of Agriculture.

Dr. Leviton has found that when whey is being condensed to the point

where crystals of milk sugar begin to form, the vitamin riboflavin is strongly adsorbed on them. A concentration of as much as 300 micrograms of riboflavin per gram of milk sugar has been prepared in the laboratory, the speaker stated.

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## "Dated" Vitamins

**"D**ATED" vitamins may presently become necessary, as a result of the discovery that oxygen is an enemy of vitamin D. This discovery was reported by Dr. J. C. Fritz, Dr. J. L. Halpin, Dr. J. H. Hooper and Dr. E. H. Kramke of Borden's Nutritional Research Laboratory at Elgin, Ill. They found that vitamin D, both natural and synthetic, deteriorated on standing, and have evidence that oxygen in the air was the cause of the mischief. They were able to protect the vitamin by applying protective coatings to the substances on which it was adsorbed, or by placing it in containers in which air had been replaced by an inert gas.

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## Oilless Axis

**T**HE ENEMY Axis, sadly lacking in oil, manages to creak along on its destructive path despite its oilless state, Dr. Gustav Egloff and P. M. Van Arsdell of the Universal Oil Products Company Research Laboratories told the meeting.

"At the end of 1941," they stated, "it was estimated that there were a total of 107,225 compressed gas vehicles which released approximately 2,553,000 barrels of liquid fuels, and a maximum of 373,143 producer gas vehicles in use in Europe, which saved about 7,780,000 barrels of oil fuel. Approximately 13,200,000 barrels of benzol and alcohol were produced on the European continent in the same period and 233,000 barrels of shale oil also had been produced. Sweden and Spain planned to

produce greater quantities of shale oil from their undeveloped resources.

"The cataloguing of the other substitutes shows that man has availed himself of animal, vegetable, and mineral products to run his motor vehicles on all the continents of the world. The only energy givers so far untapped for direct use in a motor are sunlight and atomic power, and the chances are when human ingenuity can rise to the occasion, even these too will be used."

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## PHYSIOLOGY

## Fluorine Accumulates Like Lead in Human Body

**F**LUORINE accumulates like lead in the human body when too much is absorbed, according to Dr. Willard Machle and E. J. Largent of the University of Cincinnati.

This report was made to the meeting of the American Association of Industrial Physicians and Surgeons and the American Industrial Hygiene Association in Cincinnati.

When increased quantities of various fluorides were added to the diet there was increased absorption and retention. In every case about half the amount of fluorine was absorbed and stored, regardless of how much was taken in. Normally about one milligram of fluorides is absorbed by a person on normal diet. This amount is passed off, but if more than two milligrams are taken in per day, the chemical begins to accumulate, particularly in the bones.

Commonest form of fluorine poisoning is mottled enamel of the teeth which occurs where the element is present in drinking water.

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## ENGINEERING

## Curious Behavior of "Galloping Gerty" Studied

**"G**ALLOPING GERTIE," bridge over the Tacoma Narrows in Washington State, bounced up and down to the extent of making some people seasick and finally collapsed. The bridge bounced up and down even though the wind was steady and horizontal.

This curious behavior has at last been brought to leash under the most severe mathematical formulae and probably won't happen again. The restraining formulae have been supplied by Prof. Norman Levinson of Massachusetts Institute of Technology and were reported to the American Mathematical Society