

CHEMISTRY

Glycerine Made Synthetically Expected to Stabilize Price

Long Sought in Vain by Chemical Industry, It Is Now Available from Petroleum; Made from Cracked Gas

SYNTHETIC glycerine, a product long sought in vain by chemical industry, is now available from petroleum. Recent technical reports to the American Chemical Society by Dr. Evan C. Williams, Dr. H. P. A. Groll and G. Hearne, of the Shell Development Company, Emeryville, Calif., show how unlimited quantities of the compound can be made from cracked gasoline.

Glycerol, as the chemist prefers to call glycerine to show its family relation to alcohol, has ever been the victim of fickle market conditions, since it is a byproduct of rather fixed quantity from the soap industry. A change in demand, as occasioned by war conditions or peace treaty, does not affect supply and thus prices skyrocket and dive most inconveniently. Figures from 9 to 70 cents per pound have been quoted since the World War. During the one year 1938 the price dropped nearly 60%.

Although glycerol is a simple organic compound, its molecular structure, with one atom of oxygen attached to each carbon atom, has baffled the synthetic manufacturer who must use processes of low cost. By allowing chlorine to react upon propylene, a gaseous component of cracked petroleum, the California technologists have succeeded in producing at low cost the substance allyl chloride. From allyl chloride the compound trichloropropane is then readily prepared. The molecule of trichloropropane is similar in structural design to that of glycerol, and the product is readily convertible into glycerol with the aid of cheap alkali.

Less Unpleasant

The new synthetic glycerol has been tested in gross quantities in the stomach, with effects even less unpleasant than those from the pharmaceutical grade of natural glycerol. Being identical in composition, the preparation needs attention only to purity standards, and this question is easily solved.

It is suspected that much more of interest is in view than a mere stabiliza-

tion of price and strategic war supply for use in a possible time of siege.

By combination of glycerol with acids, a remarkable array of valuable oils is possible. These compounds are analogous chemically to olive, cotton and linseed oils, but without the narrow restrictions in quality and quantity imposed by nature in plant growth.

Superior Lubricants

From petroleum it is likely that entirely new acids, perhaps those with molecules in bunch-like form instead of the chain form normally followed by plants and animals, may be available for this field of research. From such syntheses it is possible that lubricants superior to castor oil, and paint vehicles ahead of linseed oil, might be discovered. The castor and linseed products are

glycerol-acid compounds of the type in question. Furthermore, the resin industry is interested in the prospect of cheap glycerol, which with complex acids forms very complex derivatives suitable for use as plastic resins.

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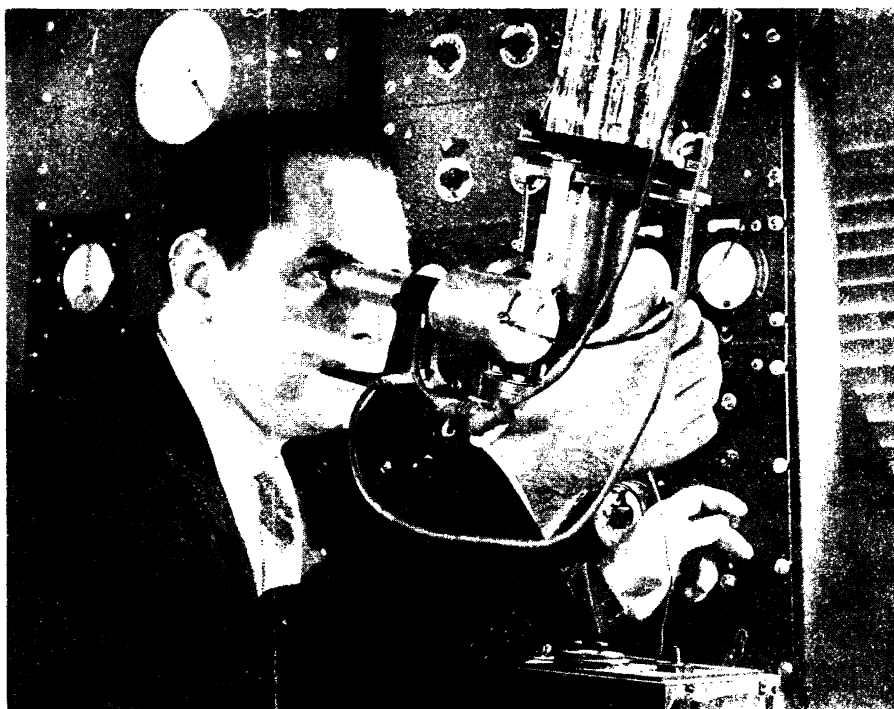
ENGINEERING

New Dams Bring Northwest America's Cheapest Power

THE GRAND Coulee and Bonneville dams will bring to the Pacific Northwest region of the U.S.A. America's cheapest commercial electric power, costing from 1½ to 2 mills per kilowatt hour (a mill being a tenth of a cent.) Here is energy for a new industrial development utilizing the large deposits of raw material and cheap tidewater transportation in connection with the inexpensive electricity.

Research workers in mining, metallurgy and geology, both State and Federal, centered at Washington's State College at Pullman are exploring vigorously new manufacturing industries capable of using the new electrical power.

Most promising are developments that make production of manganese metal and magnesium metal of high purity, practical at low cost. Most exciting is a new and simple direct method of



YARDSTICK FOR ATOMIC ENERGY

Dr. William H. Wells, in charge of the giant electrostatic atom smasher at Westinghouse, measures the energy of the atomic bullets with the aid of this little electroscope.

large-scale production of the light-weight metal magnesium, only $\frac{2}{3}$ as heavy as aluminum and $\frac{1}{4}$ as heavy as iron, from Washington State's magnesite deposits at a cost of possibly less than 8 cents per pound using the cheap Grand Coulee power. The present market price of magnesium metal made from salt brines in

Michigan is 28 to 30 cents per pound. With lower prices for magnesium metal free from chloride inclusions it would be used more widely in airplane construction, railway cars, automobile and any sort of equipment that has to be transported as a dead weight.

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A metal outfit which cost a 16th century French king—or his subjects—some-where around this fabulous sum has been acquired by the Metropolitan Museum of Art in New York. The harness, as armor experts call such a metal suit, is complete from closed helmet to steel shoes, and almost every inch is richly ornamented. Curator of Armor Stephen V. Grancsay suspects that the man who wore it was King Henry II.

The suit cost as much as a military campaign, comments Mr. Grancsay.

Never intended to stand fighting wear, the harness shows America a military dress suit de luxe, of the days when armor was really ornate.

"It was made," says Mr. Grancsay, "to

GEOLOGY

Huge Hole in Cuba Supplies Much of Nation's Manganese

DURING the Spanish-American War one of Teddy Roosevelt's Rough Riders kicked a piece of ore in Cuba and began a chain of events which today sees Cuba supplying a large share of the American steel industry's needs of strategic manganese.

The whole story of the Cuban manganese industry and its role in the economic fortification of the great American steel industry was told at the meeting in New York of the American Institute of Mining and Metallurgical Engineers by F. S. Norcross, Jr., engineer and president of the Cuban Mining Company.

Out of the kick of the Rough Rider's

foot have come great holes in Cuba—the largest a half mile long and 1,000 feet wide—which are the strip mine pits where manganese ore is dug out of the earth.

Averaging from 17% to 18% metallic manganese in content, the Cuban ores are refined and concentrated to bring them up to ferromanganese grade for use in steel making which requires 48% manganese or better.

During the years from 1936 through 1938 the steel plants of the U. S. required about 736,000 tons annually of high grade ore from foreign sources. The 1938 Cuban production was 131,000 tons.

Science News Letter, February 24, 1940

MILITARY SCIENCE

Expansion in Naval Research In New Appropriation Bill

THERE is a new deal for research in the Navy and at the top of the pile and coordinating center in the new set-up is the Naval Research Laboratory at Anacostia, just outside Washington.

Famed inventor Thomas Edison fathered the electric light, the phonograph and the new Secretary of the Navy, Charles Edison. And the same research spirit which fostered Edison's great inventions appears unwritten between the lines of testimony at committee hearing on the 1941 Naval Appropriations Bill which has just been reported to the House.

A greatly increased staff of scientists, new research equipment and buildings and a recommended budget increase of about \$300,000 yearly for research expansions alone, are among the highlights of the report.

Key step in the new research shakeup

has been the transfer of the Naval Research Laboratory from the Navy's Bureau of Engineering to the office of the Secretary of the Navy. This makes the research laboratory a peer of the Navy's other bureaus instead of a tolerated offshoot of the nation's nautical family tree.

Cold figures tell the story.

1940 budget for naval research ..	\$370,000
1941 budget requested	\$754,130
1941 budget recommended	\$653,350
Net gain	over \$283,000

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ARCHAEOLOGY

Here's One Wartime Saving; No \$25,000 Suits of Armor

ONE thing is cheaper in modern war. No king, dictator, or general is inspecting troops in a suit costing \$25,000.



FIT FOR A KING

Estimated to have cost \$25,000, this royal armor shows what a well-dressed 16th century French king wore when he appeared in public after a battle. It is the only complete embossed armor in America.

Europe has only five equal to it.