

## CHEMISTRY

# Nazis Made Peroxide

New process developed during the latter days of the war through the use of easily oxidized organic materials, it is now revealed.

► WAR-ESSENTIAL hydrogen peroxide was made in Germany during the latter days of the European conflict through the use of easily oxidized organic materials, it is now revealed. Production by this new commercial method was still on a small scale at the end of hostilities, but large-scale production appears to be feasible.

Conventional commercial methods of making hydrogen peroxide are electrochemical reactions involving the oxidation of solutions of sulfuric acid or ammonium sulfate. It has been known for some time that reactions involving the oxidation of easily oxidizable organic materials and the extraction of the resulting peroxide with water could be used; however, many factors limited the interest in these processes to laboratory investigation.

The methods discovered in Germany, in the Ludwigshaven plant of I. G. Farben Industries, were developed by two German chemists. The organic material used was 2-ethylanthraquinone. The pilot plant in use had a capacity of over a ton of peroxide a day. Plans, however, had been drawn up for building a plant with a capacity 12 times as great, but construction had not been started when the war ended.

The process is covered by a German patent issued in 1941, of which copies are available in the United States. The value of the discovery to America is that the feasibility of large-scale production of peroxide with relatively simple and inexpensive equipment by non-electrolytic methods has been proved.

Concentrated hydrogen peroxide has been called a new chemical tool which has many uses in industrial processes. The Germans used huge quantities in auxiliary devices for launching airplanes, V-bombs, naval torpedoes, jet-propelled planes and unmanned tanks. The production and use of this material were rated a top military secret by German authorities and elaborate precautions were taken to safeguard all information concerning them.

The information relative to this German method of making hydrogen per-

oxide was obtained during the postwar investigations of chemical production methods in Germany made by American scientists. The Ludwigshaven plant was visited and reported on by Ensign W. G. Gormley of the U. S. Navy. The report has just been released by the Office of the Publication Board, U. S. Department of Commerce, and can be obtained by those interested.

Among other hydrogen peroxide plants visited and reported on is the giant peroxide factory at Bad Lauterberg, investigated by Lt. Col. Max Woldenberg of the Chemical Warfare Service. Construction of this plant was begun in 1939, two units were completed by the summer of 1941, two more in 1942, and a fifth in December 1944. Each of the five units had a capacity of 240 tons a month, 80% basis. The plant used the electrolytic method, starting with the electrolysis of ammonium bisulfate.

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## D.D.T. Spraying of Pasture Can Make Milk Poisonous

► DDT SPRAYING of pastures or woodlands where dairy cattle graze may expose users of their milk to danger of poisoning, it is indicated by results of experiments reported by Drs. Horace S. Telford and James E. Guthrie of the research laboratories of Drs. Hess and Clark, Inc., of Ashland, Ohio.

The two experimenters first fed toxic doses of DDT to nursing female rats. The animals developed typical symptoms of DDT poisoning, and shortly thereafter the same symptoms appeared in their suckling young. Practically all of the rats died.

In another experiment the DDT was given to milch goats in rather heavy doses, and their milk given to adult rats. Again there was high mortality among the rats, though the goats survived. There was even a transmission of the poison: female rats receiving the milk had their milk poisoned in turn, for their young died. The poisoned milk



**BOMBER TEST**—This massive testing machine simulates landing effect of future giant bombers. This three-quarter-ton tire stops the 158 ton steel inertia wheel in 20 seconds. The 110-inch tire is slammed against the steel wheel as the steel speeds around at two miles a minute, simulating actual landing conditions without risking personnel or equipment.

from the goats seemed to have no ill effects on nursing kids, however.

Evidence was obtained that the poisonous principle is transmitted in the butterfat, for butter made from the poisoned goats' milk produced DDT symptoms when fed to rats.

Another ill effect of DDT on milk-producing animals was observed: milk flow was suppressed in the poisoned goats in from three to four weeks.

Another suggested possible source of DDT poisoning in dairy cattle is the habit cows have of licking their own skins. Thus, a cow getting in the way of a DDT sprayer could easily transfer much of the poisonous chemical from her skin to the milk. Goats do not have this licking habit. Goats receiving DDT spray on their skins remained unaffected, which is taken as evidence that the DDT is not absorbed directly through the skin.

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*Cabbage-breeding* for a high vitamin C content has already produced some lines with vitamin value exceeding those reported for grapefruit, limes and orange juice, and equalling that of lime juice.

Match sticks are treated with *ammonium phosphate* to prevent lingering embers after the flame has been blown out.