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STATUS OF GLYCERINE

(NOTE:-The following material is submitted herewith to all county and unit salvage chairmen and chairwomen of the state for their information and for release to newspapers and radio stations in such manner as is deemed most fit.)

In 1862, an obscure Swedish scientist developed a complicated chemical compound by combining "sweet oil", the nineteenth century name for glycerin, with nitric and sulphuric acids, thereby producing an explosive so terrible that the scientist, Nobel, considered war impossible from that time forward as being too destructive for the human mind to endure.

In April, 1943, the government of the United States of America found it necessary to disallow all requests for glycerin, Nobel's "sweet oil", for use in non-essential civilian products, including cosmetics, dentifrices, candy, chewing gum, shaving cream, tobacco and soap, because this same chemical is so vital to the effective prosecution of a modern war.

Nobel's calculation that his nitroglycerin would make war too terrible quickly proved to be a miscalculation. Eighty years later the denial of the glycerin required in his explosive compound was to alter the habits of thousands of Americans. Glycerin, simple component of hundreds of civilian products, was drafted early in this war, not only for the explosive compound, but in many and varied military uses.

In the Army, glycerin compounds rank second only to alcohol as a solvent in medicinal solutions. In pure form, glycerin is a powerful antiseptic, used in many types of surgical dressings. The highly effective emollient action of the chemical makes it valuable to dentists and physicians in the treatment of teeth and throat disorders, as well as sunburn and other skin irritations.

Aside from its medicinal uses, glycerin finds a spot in a wide variety of indirect military requirements. For example, the dull camouflage coatings on tanks and planes require large quantities of glycerin. Sea-planes covered with glycerin-less coatings are soon stripped clean by the corrosive action of salt water, wind and weather. Even the Army however, has had less glycerin for protective coatings than it really wanted. Glycerin compounds on wooden ammunition boxes are out, and even for Army and lend-lease purposes, beverage caps no longer are processed with glycerin.

Cellophane, an item of military necessity, can be made without glycerin, and 55 per cent is. The remaining 45 per cent of military cellophane made with glycerin is restricted to those uses where durability is a main factor, or as a packaging agent for food, where the toxic quality of the glycerin substitutes prohibits their use. The most durable cellophane of all goes into capes for army personnel as a protection against possible mustard gas attack.

Glycerin used in glassine and greaseproof papers is restricted entirely to ordnance and food packaging. In the textile and leather fields, where glycerin is vitally necessary to military dyes, as a leather softener, and as an adhesive in the manufacture of shoes, its use has been curtailed as much as possible.

In the Navy, the versatile nature of glycerin makes it irreplacable in gun recoil mechanisms, in hydraulic control mechanisms and other equipment, in ship's steering gears and compasses, and again in the protective coatings for ships parts and guns.

The vastly increased size of the Army and Navy has resulted in a corresponding increase in military demands for glycerin. These demands had to be met largely through severe civilian curtailment.

More than a year ago, the War Production Board completely prohibited the use of glycerin in the manufacture of anti-freeze solutions, and, at the same time, restricted all manufacturers to 70 per cent of their 1940 consumption, unless they were working on medical or military items. With these restrictions, glycerin supplies continued to flow into most civilian items as in the past. Later in 1942 however, a tightening supply situation required additional cuts in civilian consumption. In November, for example, use of glycerin in tobacco was cut to 48 per cent of the 1940 usage, in beverages to 50 per cent, in cosmetics and toilet preparations to 40 per cent.

January, 1943 saw the elimination of glycerin from candy, beverages and gum, its use in tobacco reduced to 35 per cent of the 1940 consumption, its use in cosmetics, flavorings and shortening dropped to 25 per cent. In March, 1943, glycerin disappeared entirely as in an emulsifying agent in shortenings.

On the first of April, 1943, many more civilian items were added to this list. No more glycerin was allotted to manufacturers of cosmetics, dentifrices, lotions, beverages, flavors, candy and all edible products (with the exception of margarine) chewing gum, shaving cream tablet and pad adhesives, tobacco, shortening, beverage crown caps, protective coatings for most civilian uses, soaps, hair tonics and shampoos.

The effect of these curtailments has not yet been felt by most consumers, since most retailers still have products containing glycerin on hand. Shortly, however, the "smooth" quality which glycerin imparts to some beverages will be lacking; cigarettes will lose the binding and moistening effect; some civilian enamels will lose that same durability that makes glycerin so valuable for military coatings.

Even though these drastic curtailments have been effective in meeting the needs of the military and lend-lease, recent surveys indicate that essential needs can be met only through continuing supplies of waste fats from the housewives of the country. This situation continues in spite of the fact that cuts in civilian use amount to millions of pounds. For example the tobacco industry, largest peace-time user, was allowed 1,280,000 pounds during the first three months of 1943, as opposed to a peace-time consumption of more than 22,000,000 (Million) pounds during 1940, cosmetic uses dropped from 4,760,000 pounds in 1940 to 630,000 for one quarter of 1943 and beverages from 3,225,000 to 24,000 pounds.

Efforts to increase the production of glycerin have met with little or no success, because of raw material shortages.

Glycerin is obtainable through three processes: (1) "fat-splitting" a method which produces approximately 10 per cent of our present supplies; (2) fermentation of sugar, used by Germany; and (3) as a by-product in the manufacture of soap, by far the most productive source.

"Fat-splitting" is a complicated industrial process whereby basic fats are divided into their component parts, one of which is glycerin. In the past, use of this process has been dependent on the industrial demand for the various other components as well as glycerin. The limited nature of this pre-war demand discouraged development of production facilities in the days when stainless steel and other metals were plentiful. The currently critical nature of these materials needed for synthetic rubber and aviation gasoline plants and many other war uses makes expansion of "fat-splitting" facilities impossible at the present time.

Fermentation of beet sugar, followed by chemical distillation, produces glycerin, as well as a host of other chemicals. This method is Germany's largest source of glycerin. Other products resulting from this fermentation distillation process go into Germany's synthetic rubber. Adoption of this method in America, in addition to being economically wasteful, would make impossible demands on our critical metal resources, as well as requiring huge quantities of sugar, a commodity already rationed because of shipping shortages. Further domestic production of beet sugar would require the use of land now needed for food production.

Unable to increase supplies of glycerin by "fat-splitting", or by fermenting sugar, this country is forced to rely on the normal industrial method which produces glycerin as a step in the manufacture of soap. Soda or potash is mixed with fat to bring about the first chemical step toward soap production. Salt is then added, and the resultant heavy brine, containing glycerin and impurities, sinks to the bottom of the mixture while the pure soap remains on top. The briny residue contains anywhere from 2 per cent to 15 per cent glycerin. After treatment to remove impurities, the residue is evaporated and most of the salt is crystalized, resulting in crude glycerin of 80 per cent concentration.

Distillation of crude glycerin with superheated steam at high temperature and in a high vacuum produces "chemically pure" glycerin -- a product containing 95 per cent glycerin and 5 per cent water. Further concentration reduces the residue of water to 1½ per cent or less, furnishing a glycerin suitable for the manufacture of explosives compounds, such as dynamite, double base powder, and other end products of nitro-glycerin.

In peace time, considerable glycerin residue was left in soaps, because there was no incentive for its removal and refining. War demands have forced the abandonment of this practice. Standards issued by the War Production Board last year established one per cent glycerin content in soap as the maximum quantity allowable; recent government action has reduced this to four-fifths of one per cent (0.8%). Further reduction of this residue is impossible for practical reasons.

Production of glycerin in the soap making process is dependent on the supplies of fats and oils available for this use. During 1941, soap factories in this country used 2,143,000,000 pounds of fat. This figure represents more than double the amount of pre-war imports of fats. In a move to protect the food supply, however, WPB found it necessary to prohibit the use of edible fats and oils in the manufacture of soap and other non-edible products. 1943 production calls for a maximum use of 1,800,000,000 pounds of fats and oils, leaving an annual production capacity of 350,000 pounds unused. Thus, the soap industry is now producing at 80 per cent of capacity.

Fat and oil shortages appeared early in the war. Most of this country's imports came from the Pacific area, and the annual volume of more than a billion pounds dwindled to almost nothing. The rising tempo of war production drew more and

more fats and oils into industrial uses, both as raw materials and as lubricants. For example, every ship launched requires an average of 40,000 pounds of animal tallow to grease the ways. Recently, as war fronts multiplied, vast quantities of fats and oils have been shipped to United Nation troops for use as food, military needs, and other supplies.

In this country, the squeeze between uncontrolled live stock prices and ceiling regulations governing sales of fresh meat has resulted in packers and butchers leaving more than a normal amount of fat on meat reaching America's tables. This practice cuts sharply into normal fat supplies from packing houses, and has the effect of putting more fat in the kitchens of the country than ever before.

In an effort to recover the fats normally thrown away, in the nation's kitchens the government last year began a continuing program to get housewives to return this waste fat to industry through the local meat dealer.

This campaign continues to be an essential long-term salvage effort. Military requirements have increased. Civilian consumption has been cut to bed-rock. Only by continued processing of the waste kitchen fats of the nation can military, lend-lease and essential civilian requirements be met. Other methods of producing glycerin have been explored and found impossible.

Present collections of waste kitchen fats are running at less than 100,000,000 (million) pounds annually, although pick-up procedures have been materially improved, and campaign publicity constantly emphasizes the drastic need. Official estimates indicate that only three women in ten salvage waste fats regularly, although country-wide polls indicate nine women in ten are aware of the campaign and its necessity.

The saving of 200,000,000 (million) pounds of waste fats -- a tablespoon a day per household -- is vitally necessary to the prosecution of the war, and to the maintaining of essential supplies of those military, lend-lease and civilian items containing glycerin. Since all other potential sources have been exhausted, and all non-essential uses prohibited, waste fat collection, and waste fat collection alone can do the job.
