itself. This speculation was based on the concept of Frazer and co-workers (1) that monoglycerides are essential elements in the mechanism of intestinal absorption of lipids and on the results obtained by Tidwell (3), showing that monoglycerides of olive oil fatty acids were more efficiently absorbed than olive oil. These facts and the successful use of monoglycerides in intravenous feeding experiments (6, 7) are compatible with the concept that monoglycerides of natural fats might be superior in nutritive value to the original fat. However from the results obtained in the present study it is evident that monoglycerides of fatty acids of cottonseed oil are not significantly better than cottonseed oil itself and the two types of lipids must be considered nutritionally equal.

Summary and Conclusions

Monoglycerides, prepared from cottonseed oil, were fed to three generations of rats at a 15% and a 25% level as the sole source of fat in the diet. Refined cottonseed oil was fed to comparable groups of rats at the same levels.

No significant differences were found between the monoglycerides and the cottonseed oil in their nutritive value as measured by growth response, reproduction ability, and lactation performance. Absorption of fatty acids, either as monoglycerides or as the original oil, from the intestinal tract was the same as shown by essentially equal coefficients of absorption for the two types of lipid at a 25% level in the diet.

Acknowledgment

Appreciation is expressed to Hugh Risley, who performed the analyses associated with the digestibility experiments.

REFERENCES

1. Frazer, A. C., Chem. and Ind., *27*, 379-82 (1947).
2. Jones, M. E., Koch, F. C., Heath, A. E., and Munson, P. L., J. Biol. Chem., *181*, 755-60 (1949).
3. Tidwell, H. C., J. Biol. Chem., *182*, 405-14 (1950).
4. Braun, W. Q., and Shrewsbury, C. L., Oil and Soap, *18*, 249-50 (1941).
5. Kuhrt, N. H., Welch, E. A., and Kovarik, F. J., J. Am. Oil Chemists' Soc., *27*, 310-13 (1950).
6. Meng, H. C., and Freeman, S., J. Lab. and Clin. Med., *33*, 689-707 (1948).
7. Lerner, S. R., Chaikoff, I. L., and Entenman, C., Proc. Soc. Exptl. Biol. Med., *70*, 388-91 (1949).
8. Hoagland, R., and Snider, G. G., U. S. Dept. Agr. Tech. Bull. 821, March 1942.

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ABSTRACTS . . . . Don Whyte, Editor

• Oils and Fats

R. A. Reiners, Abstractor

ADSORPTION SEPARATIONS IN THE FAT FIELD. VI. PAPER CHROMATOGRAPHY. H. P. Kaufmann (Univ., Münster, Ger.). *Fette u. Seifen* **52**, 331-43(1950). The literature on paper chromatography is thoroughly reviewed (81 references). Carotene is determined by capillarizing a 1-g. sample in 100 ml. petroleum ether or hexane, developing with isopropyl alcohol, and testing for β-carotene by the Carr-Price reaction. Fatty acids were separated by dissolving in pure hexane and developing with methanol containing 1% water. Mixtures of stearic and oleic acid, stearic and linoleic acid, and oleic and linoleic acid were separated in this manner. Mixtures of glycerides and fatty acids were separated by capillarizing a 2% petroleum ether solution and developing with methanol containing 1% water. Mixtures of glycerides were separated by using a 2% petroleum ether solution and developing with aqueous methanol containing 1% iso-butyl alcohol or 1% acetic acid. (*Chem. Abs.* **44**, 10351)

DISTRIBUTION OF THE FATTY ACIDS FORMED BY THE OXIDATION OF PARAFFINS [IN THE FISCHER-TROPSCH PROCESS]. H. Pardun (Ölfabriken Noblée u, Thörl G.m.b.H., Hamburg-Harburg, Ger.). *Fette u. Seifen* **52**, 290-5(1950). The influence of the degree of oxidation on the distribution of the fatty acids formed in the Fischer-Tropsch process was investigated by oxidizing samples of a paraffin fraction b_{13} 168-233°C. at temperatures of 110°, 120°, 130°, and 140° so as to yield products of acid nos. 10, 20, 40, and 80. The distribution of fatty acids formed a maximum in all cases. With decrease in degree of oxidation this maximum migrates toward fatty acids of higher molecular weight. It is probable that the primary reaction takes place at the end of the paraffin chain and that the higher-molecular weight compounds formed first are split further on continuing oxidation. (*Chem. Abs.* **44**, 10351)

AUTOXIDATION OF LINOLEIC ACID IN AQUEOUS COLLOIDAL SOLUTION. S. Bergstrom, E. Blomstrand, and S. Laurell (Univ. of Lund, Sweden). *Acta Chem. Scand.* **4**, 245-50(1950). Autoxidation of Na linoleate colloidally suspended in an aqueous pH 9 buffer seemed to yield products that were not polymerized and of a fairly reproducible composition. A maximum of 2 moles of oxygen per mole of Na linoleate was absorbed. Ultraviolet absorption rose to a maximum at one mole oxygen absorbed, then dropped to almost zero at 2 moles oxygen absorbed. (*Chem. Abs.* **44**, 9165)

SOLID SOLUTIONS OF HIGHER FATTY ACIDS AND TRIGLYCERIDES. N. N. Efremov, G. B. Ravich, and V. A. Vol'nova. *Izvest, Sektora Fiz.-Khim. Anal., Inst. Obshchei i Neorg. Khim., Akad. Nauk. S.S.S.R.* **16**, No. 3, 142-55(1948). The system's stearic acid-palmitic acid and tristearin-tripalmitin were subjected to thermal analysis, microstructure, hardness, and efflux pressure studies. At a rapid cooling rate the system stearic-palmitic acids formed a continuous row of solid solutions. At a slow cooling rate molecular compounds were formed. The latter combined with the components of the system to form some solid solutions. Microstructure studies revealed a eutectic at 70% of palmitic acid. The triglycerides have three similar temperature-concentration curves, each within a different temperature range. The curves of composition-hardness of the triglycerides system depended on the rate of cooling. The solid solutions formed within this system partially decomposed with time. The solid solutions with up to 30% of tristearin were more stable than the others. The triglycerides did not form molecular compounds. (*Chem. Abs.* **44**, 10352)

METHODS OF EXTRACTING VITAMIN A AND OIL FROM FISHERY PRODUCTS. III. EXPERIMENTS ON THE EXTRACTION OF LOW-OIL-CONTENT LIVERS WITH PETROLEUM ETHER BY THE SHAKING METHOD. F. B. Sanford and Neva L. Karrick (Tech. Lab., U. S. Fish and Wildlife Service, Seattle, Wash.). *Com. Fisheries Rev.* **12**, No. 6, 4-8(1950). In a study to determine the efficiency of oil extraction from low-oil-content fish livers with petroleum ether it was found that at a ratio of sample to solvent of 1 to 50, the sample was more completely extracted than at the lower ratios of 5 to 50 or 18 to 50. Pumice added in amount equal to volume of extracting solvent proved to be a better dispersing agent than anhydrous Na_2SO_4. (*Chem. Abs.* **44**, 9634)

THE MECHANISM OF OXIDATION OF MONOETHENOID FATTY ACIDS. FACTORS INFLUENCING HYDROPEROXIDE FORMATION AND TRANSITION IN CATALYTIC AUTOXIDATIONS. J. H. Skellon (Acton Tech. Coll.). *J. Chem. Soc.* **1950**, 2020. Oxidation of oleic acid by air at room temperature in the presence of strong ultraviolet light results in rapid formation of peroxides which then undergo transition or decomposition. Metals such as lead, aluminum, and barium were shown to accelerate, during the aerial oxidation of oleic acid at 120°, the primary stage of peroxidation but to have only a moderate effect on the transition to ketonic derivatives.

MEASUREMENT OF THE COLOR OF FATS, OILS, AND THE RESINS WITH THE HELLIGE COLORIMETER. F. Pallauf (Fabrik Abshagen & Co., Hamburg-Wandsbek, Ger.). *Fette u. Seifen* **52**, 370-2

(1950). A method is given for color comparison with aqueous I-KI solutions. The colors are reported as "iodine color nos." which are defined as the no. of mg. of free I in 100 ml. of an aqueous I-KI solution the color of which is equal to that of the sample when the sample is measured at a thickness of 10 mm. (*Chem. Abs.* **44**, 10351)

A RAPID AND DIRECT METHOD OF DETERMINING THE FAT CONTENT OF CHEESE. S. Péter (Hung. Control Sta. Dairy Products, Budapest). *Proc. 12th Intern. Dairy Congr.* (Stockholm) 2, 841-8(1949). Weigh into a 40-ml. test tube 1.3-1.7 g. cheese, add 3 ml. of absolute alcohol and 4 drops of concentrated NH_4OH, and place a glass rod in the tube. Place the tube in a water bath at 75-8° for 10 min. Stir the tube at intervals to disperse the cheese, and cool to 17-18°. Add 7 ml. of absolute alcohol and stir. Add 20 ml. of petroleum ether and stir for 30 sec. Heat at 39-40° for 8 min. Centrifuge for 1 min. and pour off the clear solution into a separatory funnel containing 10 ml. of H_2O and 0.3 ml. of concentrated HCl and 1 drop of methyl orange. Rinse the test tube with 20 ml. of petroleum ether and add to the separatory funnel. Remove the petroleum ether to a weighed flask. Evaporate the solvent and place the flask in a drying oven for 30-40 min. The increase in weight is the fat content. The method agrees within 0.1% of that obtained by the Bondzynski-Ratzloff method. (*Chem. Abs.* **44**, 10202)

MECHANISM OF THE PROÖXIDANT ACTION OF A COMBINATION OF COLAMINE WITH COPPER DURING THE AUTOXIDATION OF FATS. G. Kh. Bunyatyan and G. V. Kamalyan (Med. Inst., Erivan, Armenia). *Biokhimiya* **15**, 283-6(1950). A Cu-colamine crystalline complex of the composition $Cu(CH_2OHCH_2NH_2)_3SO_4$ was a much stronger proöxidant in the autoxidation of fats and oils than an equivalent mixture of Cu and colamine. Other amines (dimethylamine, trimethylamine, hydroxylamine, choline, sarcosine, and glycine) also formed somewhat less powerful proöxidant systems with Cu, apparently by way of complex formation. Besides colamine, only trimethylamine possessed antioxidant properties when used alone; p- and m-phenylene diamines formed no proöxidant system with Cu but checked the catalytic action of Cu. (*Chem. Abs.* **44**, 9699)

DETERMINATION OF IODINE NUMBER OF FATS BY USE OF THE SODIUM SALT OF N-CHLORO-P-TOLUENESULFONAMIDE. K. Kácl and F. Fink. *Chem. Listy* **41**, 34-8(1947). The reagent is prepared by dissolving 0.05 mol. N-chloro-p-toluenesulfonamide in acetic acid, adding 0.05 mol. finely powdered alkali metal iodide or bromide and diluting to 1 liter with glacial acetic acid. This solution (25 ml.) is added to 0.1-3 g. of fat sample in 10 ml. chloroform. After one hour 15 ml. 10% KI solution and 100-150 ml. water are added, and excess iodine is titrated. A blank is necessary. (*Chem. Abs.* **44**, 9699)

MICROMETHOD FOR ROUTINE DETERMINATION OF FAT IN SKIM MILK AND NONFAT DRY MILK SOLIDS. B. Heinemann and M. R. Rohr (Producers Creamery Co., Springfield, Mo.). *J. Dairy Sci.* 33, 703(1950). A method suitable for routine use is described for determining fat in skim milk and nonfat dry milk solids which is based on measuring the area of a monolayer of fatty extract formed by transferring 0.007 to 0.008 ml. of its ether solution to a prepared surface on a solution of 0.2% acetic acid. Results are reported which show close agreement between the proposed method and the standard Monjonnier method.

THE PANDIENE NUMBER FOR THE DETERMINATION OF CONJUGATED, UNSATURATED ACIDS. J. D. von Mikusch. *Z. anal. Chem.* **130**, 412-14(1950). There are some conjugated products of linoleic acid which do not react to any extent with maleic acid. If however 1 ml. of a 0.1% solution of iodine in acetone is added to the reagent, it is possible to obtain the desired reaction, and the same is true of other fatty acids and oils. It is proposed to call the diene no. thus obtained the pandiene no. Sometimes the pandiene no. is practically the same as the diene no., but in other cases it is much higher. (*Chem. Abs.* **44**, 9168)

SEMIMICROANALYSIS OF OIL AND FAT. I. IODINE VALUE AND SAPONIFICATION VALUE. S. Komori (Osaka Univ.). *J. Chem. Soc. Japan, Ind. Chem. Sect.*, **51**, 120-1(1948). The iodine value of about 0.03 g. oil or fat was determined by a modified Wijs method with 0.2 N ICl_3 and titrating with 0.02 N $Na_2S_2O_3$. The saponification value of about 0.1-g. samples was determined by saponifying 30 min. with 0.2 N alcoholic KOH, titrating with 0.2 N HCl and back-titrating with 0.05 N NaOH. The errors were less than 1%. (*Chem. Abs.* **44**, 9166)

DETERMINATION OF THE INDEXES OF SAPONIFICATION AND ACIDITY BY A PROCESS OF FRACTIONAL NEUTRALIZATION. E. Cherbuliez and G. Chams (Univ., Geneva, Switz.). *Festschrift Paul Casparis* **1949**, 54-6. The saponification no. is determined by reacting an oil with an amount of alcoholic KOH insufficient to saponify it, extracting the partially saponified mixture with ether, saponifying the extract in the usual way, and back titrating the unreacted KOH. Similarly, acid numbers can be determined by partial neutralization of the oil, ether extraction of the oil and unneutralized acids, and direct titration of the acids in the ether layer with NaOH in 50% alcohol. The procedures are especially adapted to dark colored oils. (*Chem. Abs.* **44**, 9166)

MICRO METHODS IN THE FAT FIELD. XIII. THE CARBONYL NUMBER. G. Gorbach (Tech. Hochschule, Graz, Austria). *Fette u. Seifen* **52**, 405-6(1950). Directions are given for carrying out the determination of the carbonyl no. on fat samples of 0.5-2.5 mg. by using the hydrazine-hydrochloride method. (*Chem. Abs.* **44**, 10351)

DETERMINATION OF GLYCEROL AND HYDROXYL NUMBER IN MIXTURES OF FATS. L. Habicht (Palmolive-Binder and Ketels G.m.b.H., Hamburg, Ger.). *Fette u. Seifen* **52**, 174-5(1950). The acetin, iodide, and dichromate methods for the determination of glycerol are reviewed. The dichromate method can be made more accurate by a preliminary treatment with basic Pb acetate, followed by extraction of the clear solution with ethyl ether to remove the lower fatty acids. The glycerol lost by the ether extraction compensates for the oxidizable impurities still present. The hydroxyl no. (H) and the % glycerol (G) can be calculated by the equations $H = 18.24\ G - E$ and $G = 0.0547\ (E + H)$, where E = ester no. (*Chem. Abs.* **44**, 10351)

THE CONTINUOUS HYDROLYSIS OF FATTY MATERIAL. C. Paquot and H. Richet (Centre natl. recherche sci., Paris). *J. recherches centre natl. recherches sci.* (Paris) **1950**, 70-2; *Bull. mens. ITERG.* **4**, 332-4(1950). The continuous hydrolysis of fats by water, without catalyst, showed that at 250-270° higher pressures and greater ratio of water to fat gives an increased yield of fatty acids. Limits used were 150 kg./cm.^{2} and 50% by weight of water. The authors recommended a two-stage process; hydrolysis first with 15% water to obtain a concentrated glycerol phase (35%), then reaction of the fatty phase again with 30 to 40% water to complete the hydrolysis. (*Chem. Abs.* **44**, 9165)

MOLECULAR STRUCTURE OF FATTY ACIDS. J. Baltes (Deut. Inst. Fettforschung, Münster/Westf., Ger.). *Fette u. Seifen* **52**, 429-34(1950). A review with 30 references. (*Chem. Abs.* **44**, 10351)

FAT-HYDROLYZING ACTION OF MICROORGANISMS. E. Zollikofer and A. Fuchs (Eidg. Tech. Hochschule, Zurich, Switz.). *Proc. 12th Intern. Dairy Congr.* (Stockholm) 2, 634-6(1949). Nine organisms were studied with butter fat. The hydrolysis varied from 8.7 to 0.4%. The fatty acids were fractionated and showed a variation in the fatty acid liberated by each organism. (*Chem. Abs.* **44**, 10038)

FAVELA. R. D. Machado, J. C. Orlando, and J. S. Fernandes. *Rev. quim ind.* (Rio de Janeiro) **19**, No. 215, 14-15(1950). Whole seeds of a species of *Cnidoscolus (Euphorbiaceae)* resembling ricinus seeds contain (dry basis) fat 33.2, crude protein 25.6, ash, 3.7, fiber 25.8, and non-N extract 11.7%. The oil is semidrying, d^{25}, 0.9160, m. 12°, n 1.4650, saponification no. 194.8. The seeds and oil are edible. (*Chem. Abs.* **44**, 10354)

LUPINE-SEED OIL. K. Täufel and Cl. Franzke (Inst. Ernährung u. Verpflegungswiss., Potsdam-Rehbrücke, Ger.). *Fette u. Seifen* **52**, 201-2(1950). Oils from the seeds of *L. albus*, *L. luteus*, and *L. augustifolius* were examined. The average constants were d^{20} 0.9296; $n^{21.5}$ 1.4735; acid no. 5.4; saponification no. 179.3; iodine no. (Hanus) 110.7; and unsaponifiable 4.5%. The fatty acid constants were: acid no. 196.1; iodine no. (Hanus) 115.9; saturated fatty acids 11.4%. (*Chem. Abs.* **44**, 10355)

TURKISH GRAPE SEEDS AND THEIR OILS. T. Yazicoglu (Univ., Ankara, Turkey). *Fette u. Seifen* **52**, 325-6(1950). Samples of five species of Turkish grape seeds were analyzed. Average analyses are water 8.1, fat 13.7, protein 8.7, N-free extract 28.1, crude fiber 38.8, and ash 2.6%. The fat had an average n^{20} 1.4741, acid no. 3.0, saponification no. 192.2, iodine no. 131.7, hydroxyl no. 7.2, and unsaponifiable 0.35%. The fatty acids contained 8.1% saturated acids, 60.3% linoleic acid, and 31.4% oleic acid. (*Chem. Abs.* **44**, 10355)

THE COMPONENT FATTY ACIDS OF TOBACCO-SEED OIL. R. V. Crawford and T. P. Hilditch (Univ., Liverpool). *J. Sci. Food Agri.* 1, 230(1950). The linoleic acid content of tobacco-seed oils varied from 69% (Indian) to 79% (English) with the values for Turkish and Rhodesian oil falling between these extremes. The glycerides of Indian oil were shown to include about 74% dilinoleo glycerides and 20% of trilinolein. The linolenic acid content of all samples was less than 2%, indicating the suitability of this oil in non-yellowing alkyd resin formulations.

SOUTHERN VEGETABLE OIL RESOURCES. II. CANDLENUT OIL AND CASTOR OILS. C. Hata (Inst. of Research of Chem. Industry, Formosa). *J. Soc. Chem. Ind., Japan* **46**, Suppl. binding 41-2 (1943). Lumbang or candlenut, the fruit kernel of *Aleurites moluccana,* contained 57-64% pale yellow oil of the following average properties: d^{20} 0.9253, n^{20} 1.4771, acid value 2.85, saponification equivalent 198.0, iodine no. 147.5. The average composition of the fatty acids was 28.1% oleic, 44.9% linoleic, 18.5% linolenic, and 8.6% solid acids. Castor seed oil was found to have the following average properties: n^{30} 1.4725, d^{30} 0.9563, iodine no. 80.8, saponification equivalent 179.9, and acetyl value 155.6. (*Chem. Abs.* **44**, 10353)

STUDIES ON THE SOUTHERN VEGETABLE-OIL RESOURCES. I. OIL OF *Calophyllum inophyllum.* C. Hata (Inst. of Research on Chem. Ind., Govt.-General of Taiwan, Japan). *J. Soc. Chem. Ind., Japan* **44**, Suppl. binding, 481(1941). The kernels of *Calophyllum inophyllum* contain oil 45, water 30, and ash 1.3%. The oil has these properties: n^{20} 1.4779-1.4857; acid no. 29.8-45; saponification no. 191.6-195.1; iodine no. 84.9-97.2; and unsaponifiable 0.66-0.80%. The neutral oil was saponified and the acids were separated as palmitic 18, stearic 8, oleic 50, and linoleic 22%. (*Chem. Abs.* **44**, 9699)

THE COMPOSITION OF THE PERICARP OF THE FRUIT OF THE PALM AND ITS CHARACTERISTIC STRUCTURE RESPONSIBLE FOR THE EXTRACTION OF THE OIL BY WATER VAPOR. L. Kehren. *Compt. rend.* **230**, 2114-16(1950). The pericarp of *Elaeis guineensis* represents 30-60% of the fruit and contains on the average 52% oil, 28% water, and 20% residual matter. (*Chem. Abs.* **44**, 9699)

CONSTITUENTS OF THE POTATO. II. POTATO FAT (ETHER EXTRACT. W. Volksen (Stadt. Krankenhaus, Nordstadt, Hannover, Ger.). *Arch. Pharm.* **283**, 203-7(1950). Air-dried potatoes extracted with ether for 12 hrs., yielded 0.1% of a fat, n^{60} 1.4740, iodine no. 95.0, saponification no. 165.7, and unsaponifiable 13.8%. Linoleic, linolenic, and palmitic acids were identified in the saponifiable fraction. The unsaponifiable contained cetyl alcohol and a steroid m. 282°. (*Chem. Abs.* **44**, 9081)

CHANGES IN FAT AFTER MANY YEARS OF GRAIN STORAGE. E. D. Kazakov and A. N. Volkova. *Doklady Akad. Nauk S.S.S.R.* **72**, 559-60(1950). When wheat, rye, or oats is stored 1-16 years, the iodine no. of the fat gradually declines with time; in oats stored 16 years the drop was less than 40% of the original; wheat loses some 40% in 11 years and rye about 25-30%. (*Chem. Abs.* **44**, 9075)

GRAPE SEED UTILIZATION. A. M. Frolov-Bagreev. *Vinodelie i Vinogradarstvo S.S.S.R.* **8**, No. 8, 15-16(1948). Grape seeds at best comprise 20% of the dry weight of the press cake. Average yield of grape oil from dry seeds is 15%. The best method of recovery is extraction with trichlorethylene. Specific gravity ranges from 0.920 to 0.956, saponification no. 178-190, iodine no. 94-143, and acetyl no. 2.7-21.5. It contains 8-13% palmitic and stearic acids and 80% linolenic and erucic acids. (*Chem. Abs.* **44**, 9700)

MELON-SEED OIL. S. R. Alpar and E. Esín (Univ. Istanbul, Turkey). *Rev. faculté sci. univ. Istanbul* **14A**, 328-35(1949). Seed of *Curcumis melo,* after drying for one day, consisted of 50% kernel and 50% shell. The kernel contained 50% oil, which was reddish yellow, and had an iodine no. of 129. Seed of the watermelon, *Curcurbita citrullus,* consisted of 65.3% kernel and 34.7% shell, and the kernels contained 36% oil. Analytical constants are given for the two oils. They can be used as edible oils and in soap and paints. (*Chem. Abs.* **44**, 9700)

EDIBLE OIL FROM TOBACCO SEED. G. Plum. *Molkerei-Ztg.* **2**, 4(1948); *Chem. Zentr.* **1948, I**, 720. Tobacco seeds contain 36-7% of oil with a nutlike taste which contains no traces of nicotine or other injurious substance. (*Chem. Abs.* **44**, 9167)

THE USES OF PURGHERE OIL. P. H. Mensier and M. Loury. *Oleagineux* **5**, 167-70(1950). Purghere is of interest since it can be grown in soils unsuitable for the cultivation of other oil-rich plants. An industrial purghere oil analyzed: acid no. 10.8; saponification no. 190.8; iodine no. 93; acetyl value 16; % saturated acids 17; and n^{20} 1.4701. Purghere oil is too toxic for human consumption, but its use as a Diesel fuel is suggested. (*Chem. Abs.* **44**, 9167)

NEW PRIMARY MATERIALS FOR THE VEGETABLE-OIL INDUSTRY OF RUMANIA. III. ANALYSIS OF BEECHNUTS AND THE OIL, FATTY ACIDS, AND EXTRACTION RESIDUE OF BEECHNUTS. I. Cornea and A. Rudenco. *Bull. etudes et recherches tech.* (Bucharest) **1**, 169-81(1949). The beechnuts used had water 7, ash 3, and oil 41% (by petroleum ether extraction). The oil had an acid no. 1.6, saponification no. 187, acetyl no. 17.02, iodine no. (Hanus) 102.7, n^{20} 1.4753, and nonsaponifiable 1.4%. The fatty acids had n^{20} 1.4665, acid no. 195.4, and iodine no. (Hanus) 107.4; the suggested composition is 75% oleic acid and 22% linoleic acid. The extraction residue contained protein 42.5, ash 5, and crude cellulose 6%. (*Chem. Abs.* **44**, 9166)

OKRA SEED. G. T. Bray. *Colonial Plant and Animal Products* **1**, No. 1, 71-72(1950). The seeds contain from 15-22% oil and, after crushing, give a cake with about 23% protein and 30% crude fiber content. The cake is as suitable for feeding to animals as cottonseed or soybean. The oil can be hydrogenated to give a stable fat usable in margarines. The oil had the following constants: sap. no. 196, iodine value 91, and unsaponifiable 1.0%. The plant is easily grown in good yields on all kinds of soil.

CHEMICAL STUDY OF THE IGUAPE NUT (*Aleurites moluccana*). N. E. Buhrer (Inst. biol. e pesquisas tecn., Curitiba-Parana, Brazil). *Rev. quím. ind.* (Rio de Janeiro) **19**, No. 216, 21-3 (1950). The average oil content of Iguape nut is 59%. The oil is bright yellow, has d^{15} 0.926, n^{25} 1.475, acid no. 3, sap. no. 191, iodine no. (Hanus) 162.8, and drying index (with 1/10 of its weight of PbO_2) 22.4%. The press cake analyzed cellulose fiber 1.50, protein 42.0, and total ash 8.30%. (*Chem. Abs.* **44**, 9167)

SPLITTING REAGENTS FOR OILS AND FATS. VII. INFLUENCE OF ALCOHOL, PHENOL, AND ACETIC ACID. S. Ueno and T. Muraji (Osaka Univ.). *J. Chem. Soc. Japan,* Ind. Chem. Sect., **51**, 164-5(1948). Bleached Japan wax (acid value 29.4, saponification value 227.8, neutralization value 207.8) was decomposed by treating 18 hrs. at 100° with H_2SO_4, H_2O, and dibutylnaphthalenesulfonate 0.1%. The addition of ethanol, acetic acid, phenol, or ethylene glycol decreased the velocity of decomposition by 50-70%. (*Chem. Abs.* **44**, 9165)

DOMESTIC AND FOREIGN OUTLETS FOR SOYBEAN PRODUCTS. C. J. Norton. *Oleagineux* **5**, No. 8/9, 537-538(1950). Summary of uses and probable requirements, both domestic and foreign.

BASIS FOR THE SPECIFICATION OF DEHYDRATED CASTOR OIL. V. A. Bianchi and P. J. Carriquiriborde. *Rivista de la Facultad de ciencias Quimicias (Quimicia & formacia)* **22**, 135-141(1947). (Published 1949). Studied the various properties of this oil in an effort to get specifications but developed only a provisional set of limiting values which are for an oil with visc. 13-5 poises; acetyl no. 25 maximum; I_2 no. (Wijs) 125 minimum; and acid no. 8. Time of gelation 120 minutes at maximum temp.

SOLVENT EXTRACTION OF VEGETABLE OILS. C. C. McInnes. *Paint, Oil & Chem. Rev.* **113**, No. 9, 20(1950). The properties of the hydrocarbons used in batch and continuous solvent extractions of vegetable oils are discussed. (*Chem. Abs.* **44**, 10353)

ELAIDINIZATION OF SUNFLOWER OIL AND GRAPE-SEED OIL. G. L. Vandone. *Ind. vernice* (Milan) **4**, 42-5(1950). Elaidinization was accomplished by agitating the oil with 30% HNO_3 for 5 minutes at 5°, adding 0.2 to 6% (on oil weight) $NaNO_2$ and after 15 minutes vigorous agitation storing for 15-24 hours. The elaidinized glycerides formed a solid layer. The liquid fractions dried about twice as fast as the original oils (*Chem. Abs.* **44**, 10354)

LOSSES DURING THE ALKALI NEUTRALIZATION OF OILS. P. Desnuelle and O. Micaelli (Faculty sci., Marseilles, France). *Oleagineux* **5**, 161-3(1950). The French and American methods for calculating losses of neutral oils are described. The authors advocate that losses be classified as a) "glyceric losses," which are triglycerides lost through the entrainment by the soap and b) "nonglyceric losses" corresponding to losses of other materials such as lecithins, partial glycerides, pigments, or glucosides through entrainment by the soap. Methods for the measurement of these losses are discussed. (*Chem. Abs.* **44**, 9165)

EFFECT OF REFINING ON OXIDIZABILITY OF UNSATURATED FATS AND OILS. K. Täufel and A. H. Nazli. *Deut. Lebensm.-Rundschau* **44**, 157-60(1948). The treatment of crude olive oil with decolorizing agents of the Al, Mg silicate group reduces the peroxide value in the same way as does active C. Nevertheless in the latter case autoxidation proceeds more rapidly than in the untreated oil while in the former autoxidation is delayed. (*Chem. Abs.* **44**, 10351)

IMPORTANCE OF THE IMPURITIES IN NATURAL FATS AND THEIR FATE DURING REFINING. II. COMMERCIAL REFINING OF RAPESEED OILS AND THE PRODUCTION OF PURE RAPESEED OILS. H. P. Kaufman, J. Bates, H. J. Heinz, and P. Roever (Reichsinst, Fettforschung, Munster/Westfalen, Ger.). *Fette u. Seifen* **52**, 35-8 (1950). Literature on the phosphatides, sterols, and carotene found in rapeseed oil is reviewed and discussed. A method of preparing an edible oil by deodorization with steam at 175° and 10 mm. Hg is described. (*Chem. Abs.* 44, 9165)

The discovery of direct hydrogenation reactions in presence of reduced nickel, with their application to oil hardening. E. André. *Oleagineux* 5, No. 8/9, 469-477(1950). Discusses history of fat hardening. 15 references.

Preserving food fats. J. P. Sisley. *Oleagineux* 5, No. 8/9, 478(1950). Discusses the biological deterioration of fats by either lipasic hydrolysis or citronic rancidity, which may be counteracted by antibiotics. The chemical or aldehydic rancidity can be counteracted by use of antioxygens such as N.D.G.A., oatmeal, palm oil, tocopherol, lecithins, hydroquinones, and gallic esters. The use of synergists such as phosphoric, citric, or ascorbic acids are outlined. The reversion phenomena and the effects of ingestion of rancid fats are discussed. 43 references.

Gallic acid ester antioxidants for fish oils. C. D. Bittenbender (Tech. Lab., U. S. Fish and Wildlife Service, College Park, Maryland). *Com. Fisheries Rev.* 12, No. 2, 1-18(1950). The stability of variously inhibited fish oils was tested in a Swift-type apparatus. The most effective antioxidant tested was glycerol monogallate dipalmitate. (*Chem. Abs.* 44, 9168)

Studies of materials in Argentine gossypol in relation to other antioxidants. R. J. Backa and A. D. Jata. *Revistad de la Facultad de ciencias Quimicas* 22, 255-257(1947). Reviews methods for estimating gossypol in cottonseed oils and also the effect of gossypol as an inhibitor for oxidation. 27 references.

The antioxidant properties of N.D.G.A. P. Blaizot and P. Cuvier. *Oleagineux* 5, 96-100(1950). N.D.G.A. is compared for antioxidant activity with hydroquinone and α-tocopherol. With lard as the test medium N.D.G.A. is superior to both, but when it is mixed with low concentrations of ascorbic acid, its antioxidant properties are enhanced. (*Chem. Abs.* 44, 9168)

Nordihydroguaiaretic acid (N.D.G.A.). P. Blaizot and P. Cuvier. *Oleagineux* 5, 164-6(1950). N.D.G.A. is an excellent antioxidant for animal and vegetable fats and oils. It stabilizes carotene and vitamin A. Analytical methods for N.D.G.A. are discussed. (*Chem. Abs.* 44, 9168)

Butylated hydroxyanisole as an antioxidant for fats and foods made with fat. L. R. Dugan Jr., H. R. Kraybill, Louise Ireland, and F. C. Vibrans (Am. Meat Inst. Foundation). *Food Technology* 4, 457(1950). Butylated hydroxyanisole when used alone or in combination with propyl gallate or citric acid has been found useful in preventing rancidity in frying oils, such as corn oil and peanut oil, and in the foods prepared from these oils. It is effective in stabilizing nuts and chicken fat and in delaying vitamin losses and the development of rancidity in dog foods. When used in good quality lard, it gives stability performance both to the lard and to crackers, and pastry made with the lard is comparable with that of hydrogenated vegetable shortenings.

Shortening. G. A. Crapple (Wilson & Co.). *Baker's Digest* 24 (1), 10-13(1950). A review of the properties various shortenings must have to meet the varied needs of the baker. [*Biol. Abs. Sect. J.* 24 (7), 1]

Fat deterioration in baked goods. F. D. Tollenaar. *Bakkerij-Wetenschap* 2 (6), 70-76(1949). Baking at high temperatures generally reduces the keeping qualities of fats, and the final water content exerts a decisive influence; generally rancidity is inhibited at higher water contents. Most promising antioxidants are gum guaiac and dodecyl gallate. [*Biol. Abs. Sect. J.* 24 (7), 2]

Recent research on oils and fats. J. H. Skellon. *Manuf. Chemist* 21, 327-329(1950). Reviews recent research on constitution of fats and their behavior on oxidation. Describes methods now used for elucidating fat structures and discusses studies on autoxidation of fatty acids and esters.

Outlook for oils and fats in the United States. Anon. Paint, Oil and Color Journal 118, 454(1950). Summary of animal and vegetable fat supplies in U.S.A.

PATENTS

Liquid surface cooler. A. F. Pinto. *U. S. 2,521,406.* This patent covers the surface cooler described in the article entitled "Rapid Method of Copra Analysis and Its Application to the Various Oil Seeds," [*J. Amer. Oil Chem. Soc.*, 26, 723 (1949)]

Stabilized chlorinated esters of fatty acids. E. W. Johnson (Metal & Thermit Corp..). *U. S. 2,524,528.* Chlorinated esters of fatty acids are stabilized by the addition of up to 5% of an alkyl stannane and a stannane derivative such as an alkyl-aryl stannane and an alkyl-acyloxy stannane.

Purification of oil. M. Mattikow and B. Clayton (Refining Uninc.). *U. S. 2,525,702.* The gums in crude fatty oils are hydrated by mixing the oil with an aqueous degumming agent containing in solution a synthetic detergent. The aqueous phase is separated from the oil in a centrifuge.

Preparation of higher fatty acids. F. E. Frey (Phillips Petroleum Co.). *U. S. 2,525,889.* An unsaturated aliphatic carboxylic acid is saturated by reacting it with an isoparaffin hydrocarbon in the presence of anhydrous hydrogen fluoride.

Refining tall oil. L. E. Gates and L. A. Radeker (Champion Paper and Fibre Co.). *U. S. 2,525,892.* Tall oil is refined by treating it with less than 0.5% of orthophosphoric acid or its acid salts at a temperature not exceeding 350°F. and passing a stream of non-oxidizing gas through the mixture.

Margarine product and method of forming. V. L. Turgasen. *U. S. 2,526,302.* A waxy margarine product is disclosed which consists of a mixture of margarine fat globules, water droplets, and minute air bubbles. All these particles are enveloped in milk protein. The fat globules are united in aggregates, and the water droplets and air bubbles are dispersed therein.

Esters of oleic acid with unsaturated alcohols. D. Swern and Geraldine B. Dickel (U.S.A.). *U. S. 2,527,597.* A copolymer is claimed which is obtained by polymerizing 2-chlorallyl oleate and vinyl acetate.

Synthetic esters. H. Wittcoff and J. R. Roach (General Mills inc.). *U. S. 2,527,870.* An unsaturated fatty acid ester of a polyhydric alcohol is claimed in which the polyhydric alcohol is formed by reacting from ½ to 2 moles of glycerol dichlorhydrin with pentaerythritol or glycerol in the presence of an alkaline catalyst.

Process for isolating sterols. D. E. Whyte (S. C. Johnson and Son Inc.). *U. S. 2,528,026.* Hot methyl cyanide is used to dissolve sterols from a concentrate containing sterols and other unsaponifiable matter. On cooling the filtered methyl cyanide solution, sterols precipitate.

Gum guaiac treatment. H. C. Black (Swift and Co.). *U. S. 2,529,446.* Gum guaiac is treated with hydrogen peroxide at 140-170°F. whereby its potential color-forming characteristics when used to stabilize fatty material are destroyed.

Fractionation of tall oil. R. M. Christenson and S. W. Gloyer (Pittsburgh Plate Glass Co.). *U. S. 2,530,809.* A process is described for obtaining the unsaponifiable matter of tall oil in concentrated form by continuously extracting in a countercurrent extractor tall oil soaps (5-25% solution) dissolved in a water-isopropyl alcohol mixture (15-50% alcohol) with naphtha at 80-130°F.

Separation of unsaponifiable matter from tall oil residue. R. M. Christenson and S. W. Gloyer (Pittsburgh Plate Glass Co.). *U. S. 2,530,810.* A process is described for obtaining the unsaponifiable matter in tall oil which consists of saponifying with alkali a distillation residue of tall oil comprising 20-50% fatty acids, 20-50% rosin acids, and 10-30% unsaponifiable matter, dissolving it in an isopropyl alcohol-water mixture (7-50% alcohol) and extracting this solution with naphtha to dissolve out the unsaponifiable matter.

Oxidation of olefinic fatty acids and esters thereof. A. Turk and P. D. Boone. *U. S. 2,530,923.* A long chain unsaturated carboxylic acid or its polyhydric esters are heated and are mixed with oxygen in the presence of not more than 10% by weight of Se, Te, or their compounds until a CH_2 group adjacent to the olefin linkage is oxidized to a hydroxyl or a ketone group.

Fatty acid refining. Synergic Foundation, Inc. *British 639,941.* Crude fatty acids are inexpensively refined in 100% yield by the use of liquefied, normally gaseous hydrocarbons, such as ethane, propane, or butane. The fatty acid solution is heated under pressure to precipitate a second liquid phase containing the impurities. (*Chem. Abs.* 44, 10356)

Lubricating oil from grape seeds. (Empresa Nacional "Calvo Sotelo"). *French 941,858.* Grape seeds are crushed, and the oil is extracted. Polymerization for 5 hrs. at 200° yields an oil having a viscosity of 61° Engler at 50°C. and 13° Engler at 100°C. Further treatment provides a resinlike material which may be used as an additive to lubricating oils. (*Chem. Abs.* 44, 9144)

Extraction of vegetable oil. M. A. Chaudary. *Indian 39,493.* Seeds, such as cashew nuts or *Calophyllum inophyllum*, are passed through a tank containing hot oil from the seeds to be extracted. The oil oozes out of the seeds, and the extracted seeds are then conveyed to a tank containing a hot solution of Na_2CO_3. As the seeds pass through this solution, the oil adhering to the seeds floats to the surface and is drawn off. (*Chem. Abs.* 44, 9701)

DEODORIZATION OF CHRYSALIS OIL OR FISH OIL. C. Oyama. *Japan 175,685.* The oil is heated with bamboo leaves. (*Chem. Abs.* 44, 10358)

• Biology and Nutrition

R. A. Reiners, Abstractor

ESTIMATION OF VITAMIN E. E. Eden and V. H. Booth (Dunn Nutritional Lab., Cambridge, Eng.). *Food Manuf.* 25, 279-82 (1950). A review with 42 references. (*Chem. Abs.* 44, 8993)

STABILITY OF CAROTENE IN ALFALFA. EFFECT OF FEED INGREDIENTS. H. L. Mitchell and R. E. Silker (Kansas Agri. Exp. Station). *Ind. Eng. Chem.* 42, 2325(1950). Expeller soybean meal and cottonseed meal mixed in a 1:1 ratio with alfalfa meal exerted some stabilizing effect on the carotene whereas solvent meals were lower in stabilizing activity. Cottonseed glands and rice bran were slightly effective in reducing carotene destruction, but hops and linseed meal were detrimental.

ABSENCE OF VITAMIN A ACTIVITY IN THE OIL OF CASHEWNUTS AND PEANUT-BRAN. C. A. Salvatore (Inst. Biol. Sao Paulo). *Rev. Brasil Biol.* 9 (1), 1-4(1949). Oil of cashewnut and oil of peanut-bran did not show appreciable quantities of vitamin A in a feeding test involving 15 rats. [*Biol. Abs. Sect. J.* 24 (7), 7]

VITAMIN A IN 155 GRAYFISH LIVERS. F. B. Sanford, G. A. Holland, and G. C. Bucher (Tech. Lab., U. S. Fish and Wildlife Service, Seattle, Wash.). *Com. Fisheries Rev.* 12, No. 3, 17-21(1950). Great variability in vitamin A content exists between individual livers and between small groups of livers. In general, as the fish increase in size, the livers become larger and contain more oil of a higher potency. (*Chem. Abs.* 44, 9019)

BIOASSAY OF FAT-SOLUBLE VITAMINS. II. BIOLOGICAL DETERMINATION OF VITAMIN A IN WHALE-LIVER OILS. A. Nakayama (Sci. Research Inst., Tokyo). *J. Sci. Research Inst.* (Tokyo) 44, 162-70(1950). Vitamin A was determined spectrophotometrically and by biological assay in rats in samples of liver oil from sperm, fin, and blue whales. Biological values were 20-50% of the spectrophotometric figures. (*Chem. Abs.* 44, 9025)

VITAMINS A AND D AND RELATED SUBSTANCES BY MOLECULAR DISTILLATION. I. CATALYTIC ACTION OF METALS ON VITAMIN A. Y. Omote (Tokyo Bunrika Coll.). *J. Chem. Soc. Japan*, Ind. Chem. Sect., 51, 115-16(1948). *Squalus suckleyi* liver oil (5.9 vitamin A units) was heated 10 min. at 200° at a pressure of 10^{-3} mm. Hg. with different metal plates immersed in the oil. The order of rates of catalytic decomposition of vitamin A was: $Cr < Ni <$ duralumin, Al, Sn, P bronze $<$ Ag, Cu, and $Fe <$ brass, $Pb < Zn$. II. CONCENTRATION OF VITAMIN A FROM *Squalus suckleyi* LIVER OIL. *Ibid.* 116-18. Distillation of the oil in a pot still resulted in a loss of 90% of the vitamin A activity. The loss with a cyclic still was nil. (*Chem. Abs.* 44, 9634)

TOCOPHEROL CONTENT OF ARGENTINIAN WHEAT GERM OIL. O. R. Vera and R. Nico. *Rev. facultad cienc. quim.* 22, 231-239(1947). (Pub. 1949). A review with 59 references on the methods of measurement for the tocopherol content of wheat germ oil.

THE PHYTOSTEROLS OF THE SOYA AND THE SYNTHESIS OF HORMONES AND VITAMINS OF STEROID CONSTITUTION. A. Matagrin. *Ind. Agr. alim.* 67, 221-229(1950). Yields, composition, and properties of the phytosterols of soybean are given. The properties, structures, and uses of sterols are reviewed.

THE UNSATURATED FATTY ACIDS IN THE THERAPY OF PULMONARY TUBERCULOSIS. F. Hänel and S. Piller. *Beitr. Klin. Tuberk.* 103, 239-44(1950). Cod liver oil is favorable to the healing of tuberculosis; fats act favorably, but cod liver oil exceeds fats in value. Vitamins A and D do not act as well as cod liver oil. Unsaturated fatty acids (UFS) in cod liver oil appear to account for its favorable action in tuberculosis. UFS in 1:50,000 retards growth of tubercle bacilli in vitro. Favorable results with patients are recorded. (*Chem. Abs.* 44, 10144)

SOYBEAN PROTEIN IN HUMAN NUTRITION. A COLLECTIVE REPORT ON NEWER AMERICAN WORK. A. Hesse. *Z. Lebensm.-Untersuch. u.-Forsch.* 90, 373-82(1950). A review. 32 references. (*Chem. Abs.* 44, 9023)

IS THE USE OF SYNTHETIC FATTY ACIDS FOR DIETARY PURPOSES HARMLESS? K. Thomas and G. Weitzel (Max Planck Ges., Gottingen, Ger.). *Klin. Wochschr.* 27, 784-6(1949). The use of synthetic fats is defended on the following grounds: a) oxidation products are now largely removed with superheated steam; b) isoparaffins and isofatty acids can be extracted with solvents; c) the quantity of diacidogenic fatty acids C_9-C_{11} ingested with synthetic fats is not sufficient to be harmful; d) methylated fatty acids are metabolized to a large extent; e) succinuria is not necessarily caused by synthetic fats; and f) synthetic fats have been much improved since before the war and are capable of further improvement. (*Chem. Abs.* 44, 9019)

IS THE USE OF SYNTHETIC FATTY ACID FOR NUTRITION PURPOSES DANGEROUS? H. H. Meyer-Döring (Hyg. Inst. Hansestade, Hamburg, Ger.). *Klin. Wochschr.* 28, 233-4(1950). A discussion against the use of synthetic fats (made from coal) in the diet. 28 references. (*Chem. Abs.* 44, 10075)

QUALITY DECREASE AND CHEMICAL CHANGES IN FROZEN FATTY TISSUE. A. Mironov. *Myasnaya Ind. S.S.S.R.* 21, No. 3, 26-8 (1950). The shrinkage (weight decrease due to water evaporation) and the acid no. of the fat of frozen fatty tissues were tabulated for 10, 30, and 90 days' storage. The beef omentum and surrounding kidney fatty tissues stored 90 days without decrease in quality; that of mutton was good for 70-90 days; the frozen kidney fatty tissue of hogs stored without decrease in quality for 60 days and the hog omentum fatty tissue for 30 days. (*Chem. Abs.* 44, 9581)

THE EFFECT OF CIS-VACCENIC ACID ON GROWTH AND RESPIRATION OF *B. subtilis*. H. Laser (Molteno Inst., Univ. Cambridge). *Biochem. J.* 47, XXXII (1950). The "double action" of vaccenic acid on *B. subtilis* (first inhibiting, then stimulating respiration) was confirmed, and the author suggests that it be explained on the basis of a) penetration of acid into the cell; b) an unspecific inhibition of the succinic oxidase system; c) ability of the organism gradually to metabolize penetrated acid; and d) development in treated cells of a mechanism resembling that of acquired drug resistance.

THE BIOSYNTHESIS OF RADIOACTIVE FATTY ACIDS AND CHOLESTEROL. R. O. Brady and S. Gurin (Univ. of Penna.). *J. Biol. Chem.* 186, 461(1950). Rat liver slices are capable of synthesizing long chain fatty acids and cholesterol from acetic, pyruvic, butyric, hexanoic, and octanoic acids. The addition of insulin stimulates the incorporation of acetic acid into long chain fatty acids, but it had no effect on the utilization of the other acids. Data are presented which indicate that the synthesis of long chain fatty acids from short chain acids probably occurs, to a large degree, by fragmentation of these acids to 2-carbon units which are subsequently recombined to form long chain fatty acids.

STUDIES OF THE COMPARATIVE NUTRITIVE VALUE OF FATS. XIII. GROWTH AND REPRODUCTION OVER 25 GENERATIONS ON SHERMAN DIET B WHERE BUTTERFAT WAS REPLACED BY MARGARINE FAT, INCLUDING A STUDY OF CALCIUM METABOLISM. H. J. Deuel Jr., S. M. Greenberg, Evelyn E. Savage, and L. A. Bavetta (Univ. of So. Calif.). *J. Nutrition* 42, 239 (1950). Hydrogenated vegetable margarine can supply the fat requirements of the rat over many generations. The employment of such hydrogenated fat results in equally effective calcification as that obtained when animal fat such as butter is present in the diet.

PHOSPHORYLATION OF HIGHER FAT ACIDS NECESSARY FOR THEIR DESATURATION BY LANG'S ENZYME. A. Jacob and M. Pascaud (Inst. Cancer, Paris). *Compt. rend. soc. biol.* 143, 1476-8(1949). The transformation of palmitic and stearic acids to palmitoleic and oleic, respectively, requires a preliminary phosphorylation, but it was shown that this phosphorylation is not catalyzed by an ordinary alkaline phosphatase but by an enzyme of the acylphosphorylase type. This enzyme requires a coenzyme, either adenosine or adenylic acid. (*Chem. Abs.* 44, 8971)

INFLUENCE OF FAT IN DIET UPON NITROGEN BALANCE AND LIVER REGENERATION. C. S. Rogers, C. C. Ferguson, C. E. Friedgood, and H. M. Vars (Univ. of Penna.). *Am. J. Physiology* 163, 347(1950). Following 70% partial hepatectomy in previously protein-depleted rats, the increments of liver protein and body weight and N conservation increased and the liver lipid concentration decreased as the postoperative dietary protein was increased. The liver composition was essentially identical; the N conservation, slightly less; and the body weight gains significantly greater in 10% and 30% fat-fed animals as compared to 3% fat-fed animals when the diet contained equal total amounts of calories, N, vitamins, and minerals.

Lipids of lymph following feeding of fat: an experimental study. J. L. Bollman, Eunice V. Flock, J. C. Cain, and J. H. Grindlay (Mayo Foundation and Mayo Clinic). *Am. J. Physiology* **163**, 41(1950). The concentration of total lipids or total fatty acids of lymph from the small intestine or the thoracic duct of dogs increased enormously after administration of a meal rich in triglycerides or oleic acid, owing largely to an increase in the concentration of neutral fat. A threefold increase in concentration of phospholipid was associated with the maximal increases found in neutral fat. Little change was found in the cholesterol content of the lymph.

Fat metabolism in human subjects. J. R. Chipault and W. O. Lundberg. *Hormel Inst., Univ. Minnesota, Ann. Rept.* **1946/47**, 35-8. In subjects living for 23 days on a fat-free diet (providing 2 g. of protein and 40 kcal./kg. of body weight daily) the dry weight, lipids, fatty acids, and unsaponifiable matter of the feces greatly decreased. Triolein was given for a further 12 days, when the dry weight, total lipids, and fatty acids rose, but the unsaponifiable matter remained constant. During the early stages of this diet the fatty acids of the feces were liquid at room temperature; toward the end they were solid. During most of the period of fat-free and triolein diets, the N balance was slightly negative; there was no significant loss of weight in the persons receiving the diets. (*Chem. Abs.* **44**, 10066)

Biogenesis of the fatty acids of natural fats. K. Täufel (Inst. Ernährung u. Verpflegungswiss., Potsdam-Rehbrücke, Ger.). *Fette u. Seifen* **52**, 398-401(1950). A review with 43 references. (*Chem. Abs.* **44**, 10351)

PATENTS

Process for preparing soybean meal. H. O. Renner (J. R. Short Milling Co.). *U. S. 2,524,991.* A refined soybean meal is produced by extracting solvent deoiled soybean meal with glycol monomethyl ether or glycol monoethyl ether.

Process of separating carotene fractions and tocopherol-sterol fractions from green plant materials. M. E. Wall (U.S.A.). *U. S. 2,527,602.* A mixture of carotene, tocopherol, and sterols is dissolved in a high boiling oil, and this mixture subjected to molecular distillation. At a temperature from 120-180° a carotene-free tocopherol-sterol fraction is obtained, and at a temperature in excess of 180° a fraction rich in carotene is obtained.

• Waxes

E. H. McMullen, Abstractor

The refining and bleaching of sugar cane wax. H. H. Hatt, P. H. A. Strasser, and W. J. Troyahn. *Proc. of the Queensland Society of Sugar Cane Technologists,* 17th Conference, pp. 61-81, April, 1950. The crude sugar cane wax contains much ash-producing material, which is shown to consist probably of soaps, phosphatides, and phosphatidates. After the inorganic matter has been removed by heating with mineral acids, a softer wax of higher acidity remains. The acidic and the softer components of this wax may be readily distilled under low pressure in steam or other inert gas, leaving as a residue a hard dark wax, which is odourless, contains little acidic material, and is comparable with the hard, dark waxes obtained by solvent processes of refining. The distillates from the low pressure distillation are pale-yellow-brown pastes. The behaviour of chemical bleaching agents is reported. Chromic acid is much superior to the other agents examined. The hard, dark waxes are readily converted by this agent into pale, hard, glossy waxes having high acid values. The behaviour of these waxes in wax-solvent preparations is reported.

Emulsion reactions. The hydrolysis of wool wax. J. L. Horner and E. V. Truter. *Nature* **165**, 771(1950). The emulsion hydrolysis of wool wax proceeds more rapidly in a water-in-oil emulsion than in an oil-in-water emulsion. The rate of reaction is influenced by the magnitude of the interface as well as by the effect of reaction products. A 2N NaOH solution in 4N NaCl solution at 60° is as effective as 4N NaOH at the same temperature, illustrating the dual role of the alkali as electrolyte and as reactant. (*Chem. Abs.* **44**, 8681)

Paraffin and microcrystalline waxes. Donald T. Jones (Atlantic Refining Co.). *Soap Sanit. Chemicals* **26**, 11, 125-127(1950). A review of the refining methods, testing, and properties of paraffin and microcrystalline waxes and mixtures of the two.

PATENTS

Method of producing and using fruit and vegetable coating wax. Sidney C. Rieke. *U. S. 2,502,592.* A waxy composition consisting of paraffin with carnauba wax and/or beeswax, and a method of forming it in cakes so that it may be applied to fruit and vegetables are described.

• Drying Oils

Stuart A. Harrison, Abstractor

Elementary processes in the drying of oils. W. Kern. *Farben, Lacke, Anstrichstoffe* **4**, 242(1950). The general mechanism of the polymerization of unsaturated compounds is reviewed. The processes of chain initiation, chain transfer, and chain termination are described as well as the effect of oxygen, peroxides, and metallic driers. The general mechanisms are applied to the drying of linseed and chinawood oils. The fatty acid radicals are linked by C–O–C, C–O–O–C, and C–C bridges. Oil drying is a polymerization initiated by peroxides (formed by autoxidation), with unsaturated acyl groups, etc., acting as reducing agents, catalyzed by metallic driers. There is no true chain propagation because of the low polymerizing tendency of the acid radicals and because of the inhibiting action of oxygen. This causes the formation, near the film surface of hydroxylated derivatives and of C–O–O–C linked polymers which may be the cause of film degradation. The chains are probably short and alternate in linkages. (*Chem. Abs.* **44**, 9696)

Some new developments in drying oil and varnish technology. T. F. Bradley. *Official Digest Federation Paint and Varnish Production Clubs* **No. 310**, 795(1950). Recent developments in the field are reviewed and original data presented. High iodine number oils can be prepared by urea refining. When mixtures of fatty acids or methyl esters of fatty acids are mixed with a saturated solution of urea in water or methanol, crystalline complexes are formed. The saturated and mono-unsaturated fatty acids or esters form these complexes more readily than the poly-unsaturated acids. The complexes can be filtered off and decomposed to yield a low iodine extract. The remaining raffinate has a high iodine number; e.g., soybean fatty acids of Wijs iodine value 132 give an extract with an iodine value of 90 and a raffinate of iodine value 177. The preparation of a styrenated linseed alkyd resin by three methods, a) styrenation of final alkyd, b) styrenation of fatty acid, and c) styrenation of mono-glyceride did not affect the film properties of the final alkyds appreciably. The replacement of glycerine by other polyhydric substances is discussed. One of the most recent of these is the condensation products of dihydric phenols with epichlorohydrin. This polyhydric compound is valuable in ''upgrading'' soybean, dehydrated castor, linseed oils, etc., through esterification. The final esters show a substantial improvement in water and alkali resistance as well as drying speed. Developments in oil-free coatings are discussed. (27 references).

Epon resins—New film formers. Technical Staff of Shell Chemical Corp. *Paint, Oil, and Chem. Review* **113**, No. 23, 15 (1950). The postulated structure of Epon resins which result from the condensation of epichlorohydrin with 2,2(4,4' dihydroxy diphenyl) propane is given. The field of application and properties of coatings made from these resins and their derivatives are given.

The kinetics of esterification and the properties of drying oils from diglycerol. Anon. *Official Digest Federation Paint and Varnish Production Clubs* **No. 310**, 827(1950). The kinetics of the reaction of diglycerol with soybean fatty acids was compared with glycerol. The two polyhydric alcohols both show second order reactions in esterifications. The greater functionality of the diglycerol ester exhibits itself in faster drying rates and better water and alkali resistance of the films.

Water-in-oil emulsion varnishes and paints. W. Bosch. *Official Digest Federation of Paint and Varnish Production Clubs* **No. 310**, 878(1950). The report by H. Wagner that about 11-14% of water was bound in the film was carefully investigated. Results showed only small percentages of volatile materials remained in the air dried film. A qualitative test for water in the film was negative. It was found that thinned, bodied oils gave better results than unbodied oils.

The drying properties of the oil of the candle nut tree. L. Kehren. *Oleagineux* **5**, 359(1950). The oil has a saponification value of 201 and an iodine value of 152. The slow rate of oxidation indicates that an antioxidant is present. The antioxidant is unstable to heat because the oxygen absorption after oil samples are heated to 250° for one hour is rapid. The drying properties of the oil are good.

The use of oiticica oil in alkyl resins. A. P. Pollini. *Ind. vernice* 3, 193(1949). The monoglycerides of oiticica, linseed, and tung oils were made by alcoholisis with glycerol and NaOH (catalyst). Alkyds containing 35% phthalic anhydride and 50% oil which were prepared by heating to an acid number below 20, had a Gardner viscosity (50% solution in turpentine) of X-Z. The oiticica-linseed mixtures bodied much more slowly at 240° than the corresponding tung-linseed modified alkyds. (*Chem. Abs.* 44, 9696)

Skinning (in closed container) of glyceryl phthalate varnish. K. van Lerberghe. *Congr. tech. intern. ind. peintures inds. assoc.* 1, 566(1947). Various anti-skinning agents were added to the medium-length drying oil alkyd varnish. Dipentene, *o*- and *p*-amylphenol, and sulfate turpentine, used singly in proper amounts, prevented skin formation up to 13 months but also retarded normal drying of the varnish. About six parts of dipentene to 100 parts of varnish is recommended. (*Chem. Abs.* 44, 10348)

Inconveniences in synthetic (resin) varnishes and their remedies. L. Angelino. *Ind. vernice* (Milan) 4, 5 (1950). Varnishes made by blending solutions of drying-oil-modified alkyd resins with solutions of rosin modified phenolic or maleic resins at room temperature show signs of nonhomogeneity. After a study of varnishes made with 50 and 65% soybean oil, modified alkyds, and the modified resins, several remedies were suggested for improving the homogeneity a) to cook the alkyd and hard resin together at 240-75° until they form a clear drop and then dissolve in V.M.P. naphtha; b) to replace part of the solvent by high flash (or similar aromatic) naphtha; and c) to cook the hard resin with a drying oil (15 Kg. oil/50 Kg. resin) until a varnish compatible with mineral spirits is obtained. (*Chem. Abs.* 44, 10347)

Oxidation and dehydration of castor oil. A. K. Plisov and E. G. Tomson. *Thur. Priklad. Khim.* (J. Applied Chem.) 23, 200(1950). Castor oil is dehydrated by passing down through an aluminum tube containing activated clay and heated to 400°. Air is passed countercurrent to the oil through the tube. The product under these conditions readily forms a tough clear film on drying in air. (*Chem. Abs.* 44, 10346)

Selection of driers for dehydrated castor oil and retardation of drying by copper. Anon. *Congr. tech. intern. ind. peintures inds. assoc.* 1, 451(1947). The drying rate of dehydrated castor oil with metallic naphthenate driers was studied by the rolling ball method. The oil (Dienol) had an iodine No. of 129, acid No. 3.2 and viscosity of 320 centipoises. Co, .1% and Pb 2.0% were most effective. Mn. and Zn. retarded drying. Films on copper were retarded in drying. (*Chem. Abs.* 44, 10346)

Dehydrated castor oil. III. Durability of Varnishes Prepared with Dehydrated Castor Oil. R. Dooper. *Centraal Inst. Materiaal Onderzoek*, Afdel, Verf., Circ. **No. 61**, 9 pp.(1950). Results of outdoor exposure tests on varnish systems containing bodied dehydrated castor oil are given. The ratio of dehydrated castor oil to tung oil or bodied linseed oil in the short oil varnishes used as sealers had no effect on durability. Replacement of other oils by dehydrated castor in finished varnishes increased after-tack. All systems cracked badly between 6 and 12 months. (*Chem. Abs.* 44, 10346)

The bleaching of linseed oil by means of chemicals and the influence of certain antioxidant substances. P. Colomb. *Ind. vernice* (Milan) 3, 220(1949). The effect of adding various percentages of benzoyl peroxide to linseed oil and heating to 105° was studied. There was an increase in refractive index with increase in benzoyl peroxide. Samples of the oils which stood for 180 days in stoppered bottles at room temperature in the dark showed a further increase in refractive index, viscosity and oxygen absorption rate and a decrease in iodine number (Wijs). The increases were proportionately greater with more peroxide. (*Chem. Abs.* 44, 9695)

Synthetic materials based on drying oils. C. P. A. Kappelmeier. *Chem. peintures* 13, 348(1950). An address with 15 references. (*Chem. Abs.* 44, 10345)

Improvement of drying oils by means of selective solvents. A. Molyn. *Congr. tech. intern. ind. peintures inds. assoc.* 1, 421(1947). Experiments in solvent fractionation of bodied linseed oil by a batch process are described. Acetone and butyl alcohol were satisfactory as solvents; furfural, acetic acid, ethyl acetate, and aniline were not. In a typical experiment one part of oil was stirred 30 minutes with three parts of boiling solvent and let stand for 12 hours to separate. The oil fraction made from it had good drying properties and could be used to make varnishes with good alkali and water resistance. (*Chem. Abs.* 44, 10345)

New methods for the improvement of drying oils. Maleate oils. J. Baltes. *Fette u. Seifen* 52, 420(1950). A review with 26 references. (*Chem. Abs.* 44, 10345)

Electro-chemical tests for oils used as anti-corrosion points. V. Cupr. and J. Simácek. *Chem. Listy* 41, 178(1947). Corrosion of a metal is promoted by changes in the nature of the protective oil film. These changes can be followed by measuring the electrical conductivity of the oil film by means of a pair of electrodes of different metals. Apparatus and tests are described. (*Chem. Abs.* 44, 9693)

The yellowing of linseed oil. P. Colomb. *Ind. vernice* (Milan) 4, 64(1950). A linseed oil decolorized with fuller's earth, which yellowed strongly in diffused light, and another, bleached with 0.5% benzoyl peroxide which yellowed only slightly, were subjected to *chromato graphic analysis* by means of Al_2O_3 from solutions of petroleum ether. The former gave a green band (5 mm.) a colorless zone (100 mm.) and a yellow band (10 mm.) while the latter gave only a yellow band (10 mm.) preceding a colorless zone (105 mm.). The green band carried the characteristic linseed oil odor. The extracted colorless materials yellowed much less than the starting oils. Mucilaginous matter, antioxidants, and Co-Pb or Co-Mn drier combinations favored yellowing. (*Chem. Abs.* 44, 10346)

Accelerated yellowing tests on white enamels. Anon. *Official Digest Federation Paint and Varnish Production Clubs* **No. 310**, 815(1950). Four pigment combinations in a soya alkyd and a linseed alkyd were studied. Steel panels were prepared and subjected to numerous exposure conditions. Conclusions were: a) exposure in a dark cabinet is not particularly an accelerated test, but agrees rather closely with normal daylight exposure; b) ammonia atmosphere, elevated temperature, elevated temperature and humidity, and saturated humidity plus light from a Mazda lamp promote yellowing rapidly (about three days for seven months normal exposure) and in good agreement with the results obtained by a long time normal exposure.

The effect of zinc oxide on architectural white alkyd enamel. Anon. *Official Digest Federation Paint and Varnish Production Clubs* **No. 310**, 806(1950). Seven representative long oil alkyd enamels were studied for the effect of the addition of small amounts of zinc oxide on the yellowing properties. The enamels were tested for can stability, drying, color change, and gloss retention. The following observations and conclusions were made. Films containing zinc oxide will yellow in subdued light and bleach in bright light. The gloss retention of films having small (2.5%) amounts of zinc oxide was better than that of those having larger amounts (5 and 10%). Zinc oxide had little or no effect on drying rate of the enamels.

PATENTS

Salts of condensates of rosin with unsaturated acyclic or cyclic hydrocarbons. A. L. Rummelsburgh. *U. S. 2,527,-577-8.* Rosin is condensed with butadiene, isoprene, styrene, cyclopentadiene, indene, or other conjugated acyclic or cyclic hydrocarbons by dissolving the reactants in ethylene dichloride, cooling to —12° and adding boron trifluoride gas. The products are fairly high melting 100-120°. The lead, zinc, calcium, etc., salts of these rosin condensation products can be used in the customary varnish making techniques with drying oils, etc., to make good varnishes.

Wrinkling oils. G. M. Williams. *U. S. 2,528,937.* Oils which are ordinarily non-wrinkling, e.g., soybean oil, sunflower seed oil, and other vegetable oils can be made into wrinkling oils by heating to 120° in an inert ambient atmosphere after the addition of .05% of sodium.

Process of preparing synthetic drying oils. J. C. Zimmer and J. H. Bartlett. *U. S. 2,529,322.* Polymer oils are obtained by steam cracking of a petroleum fraction such as gas oil. The cracked products are given a clay treatment at temperatures of 250 to 500°F. The fraction boiling above 430°F. is useful in the preparation of drying oils. Typical properties of the cracked and treated oils are: diene No. 21.1; iodine No. 207.4; viscosity at 100°F. S.S.U. 1266. These products can be condensed by heating them above 100° with alpha, beta unsaturated carboxylin acids or dicarboxylin acids to give drying oil acids. These can be esterified with monohydric or polyhydric alcohols to give drying oils.

Modification of drying oils. G. M. Williams. *U. S. 2,529,-528.* The siccative properties of hemp seed, fish, and other drying or semi-drying oils are increased by halogenating the oil to about 25% of its unsaturation, then reacting the halogenated oil with a sodium derivative of unsaturated hydrocarbon, such as 1-sodium 1,2-propene. The reaction is carried out at 250°F. for 30 minutes, and a condensation product is formed. Similar results can be obtained with 1-sodium oxybutadiene.

MODIFIED DRYING OIL-ALKYD RESINS AND PROCESS OF MAKING THEM. J. B. Rust and W. B. Caufield. *U. S. 2,530,315-16.* Glycerol (24.8) linseed oil acids (37.8), phthalic anhydride (42.8), and diallyl maleate (26.8) are heated together to 200° in 25 minutes and maintained at 200-220° for 55 minutes. The alkyd resin is soluble, light colored, and clear; it can be drawn into strings 18-24 inches long. Other polyhydric alcohols, dibasic acids, and unsaturated esters may be used. These alkyds dry to durable films with or without drier. These alkyds are compatible with nitro-cellulose, improving the toughness and elasticity of the film.

• Detergents

Lenore Petchaft, Abstractor

THE RELATIONSHIP BETWEEN DETERGENCY AND ADSORPTION BY THE FIBER. K. Melaren. *J. Soc. Dyers Colourists* **66**, 521-9 (1950). The effect of four variable factors: temperature, detergent, acid, and salt concentration on wool-detergent properties of a specific non-ionic surface-active compound has been studied in detail; the effect of each on the adsorption of detergent by the fiber has also been determined. It has been shown that increasing the temperature from the normal wool detergency temperature of 50° to 80-90° causes an increase in detergency efficiency. At these temperatures an increase in detergent concentration also improves detergency. No adsorption of detergent by the fiber could however be detected. The effect of adding acid to the detergent solution is to cause an increase in detergency; at high temperatures, when a certain acid concentration is exceeded, the detergent efficiency is reduced. Both these effects are accompanied by an increase in the adsorption by the substrate as the acidity increases. The decrease in detergency is due to excessive adsorption, which reduces the concentration of free detergent below that necessary to retain already detached soil in suspension; redeposition of soil then occurs. Adding sodium chloride to the detergent solution causes an improvement in detergent efficiency up to the concentrătion where precipitation occurs; this concentration is lower the higher the temperature. At higher concentrations the detergent efficiency falls. No adsorption by the fiber could be detected at salt concentrations below the critical value. In the case of acid additions the increase in adsorption causes the improvement in detergency; however some other mechanism must be responsible for the increase in detergency at higher temperatures and in the presence of salt.

STUDIES IN DETERGENCY. VIII. ELECTRON-MICROSCOPIC OBSERVATIONS OF FIBER SURFACES. W. Kling and H. Mahl. *Melliand Textilber* 31, 407-13 (1950). In an extensive investigation on detergency observations of the surface of fibers using the electron microscope were made. This paper, which is illustrated by many photomicrographs, describes the preliminary results obtained with clean fibers of cotton, flax, wool, silk, viscose and acetate rayons, and nylon. With cotton the fibrillae of the secondary wall were visible through the cuticle and primary wall. The presence of a thin outer skin, which fairly readily flaked off, was observed on nylon. (*J. Soc. Dyers Colourists* Abstracts **66**, 562 (1950)

X-RAY PATTERNS OF SOAPS. A. J. Stosick (Univ. of Southern California, Los Angeles). *J. Chem. Phys.* **18**, 757 (1950). Anomalies in the x-ray patterns of soaps are interpreted in terms of a disordered structure in which the micellar layers are superimposed with stacking disorder, along with some physically reasonable assumptions concerning disorder within a micellar layer. One consequence is that the (001) spectra are unaffected by the stacking disorder and therefore correspond to those given by a well-ordered layer sequence; the so-called "side spacings" can be identified as higher orders of the (001) series. It is believed that the list of different diffraction patterns, which have been identified with different polymorphic forms, merely represent different conditions of ordering and that only single-crystal specimens really represent true phases. (*Chem. Abs.* **44**, 7118)

PHYSICOCHEMICAL INVESTIGATIONS ON MICELLES OF POTASSIUM MYRISTATE AND LAURATE. Kirsti Granath (Univ. Uppsala, Sweden). *Acta Chem. Scand.* **4**, 103-25 (1950). Physicochemical measurements were made on micelles of potassium myristate and laurate in solutions containing KBr and K_2CO_3 at various ionic strengths. The degree of solvation, partial specific volume, sedimentation, and diffusion constants were determined together with studies of the viscosities of the solutions and of the ability of the micelles to dissolve *p*-dimethylaminoazobenzene. The size of the micelles increases with increasing ionic strength of the medium; this increase is especially pronounced for K myristate and rather moderate for K laurate. The data indicate that the micelles are cylindrical disks. (*Chem. Abs.* **44**, 8738)

PHYSICAL-CHEMICAL PROPERTIES OF WETTING AGENTS. E. Bartholome and Karl Schafer (Badische Anilin u. Soda Fabrik., Ludwigshafen/Rhein). *Melliand Textilber.* 31, 487-91 (1950). The speed of wetting is of special interest in wetting processes. Surface tension is a static figure, therefore inadequate. The change of surface tension with time, after producing a fresh surface, will give the speed of wetting experimentally. The conception that the change of surface tension with time is determined by diffusion of the wetting agent from the interior of the solution to the surface yields a theoretical formula which is in good agreement with practical measurements of surface tension and sinking time of fabric squares. (*Chem. Abs.* **44**, 9156)

THE EFFECT OF ADDED HYDROCARBONS UPON CRITICAL CONCENTRATIONS OF SOAP AND DETERGENT SOLUTIONS. H. B. Klevens (University of Minnesota, St. Paul, Minn.). *J. Phys. & Colloid Chem.* **54**, 1012-15 (1950). Increment addition of benzene to soap solutions causes a very small decrease in the critical micelle concentration. Equilibrium values were obtained in certain systems only after 100 hrs. or more.

A SCHEME OF ANALYSIS FOR COMMERCIAL DETERGENTS. I, II. J. A. Gilby and H. W. Hodgson (British Oxygen Co., Ltd., London). *Mfg. Chemist* 21, 371-6, 423-6 (1950). Methods are outlined for the isolation of active principles from builders and other additives by azeotropic distillation and alcohol extraction for liquid and solid samples. The Linsenmeyer procedure for the identification of surface-active agents is modified and extended to include fatty acid esters of sulphoactamide, alkyl aryl polyether sulphonates, and alkyl sulphate monoglycerides. A scheme is proposed which indicates not only the type but also the fine structure of the active principle. Methods are also given for the detection of special additives such as carboxymethylcellulose, optical bleaches, and perhydrates.

THE STRUCTURE AND PROPERTIES OF AQUEOUS SOLUTIONS OF SOAP. H. Berry and H. S. Bean (Univ. of London). *J. Pharm. Pharmacol.* 2, 473-83 (1950). A review with 56 references. (*Chem. Abs.* **44**, 9701)

THE BACTERICIDAL ACTIVITY OF PHENOLS IN AQUEOUS SOLUTIONS OF SOAP. I. THE SOLUBILITY OF A WATER-INSOLUBLE PHENOL IN AQUEOUS SOLUTIONS OF SOAP. H. S. Bean and H. Berry (University of London, London). *J. Pharm. Pharmacol.* 2, 484-80 (1950). The solubility of benzylchlorophenol in aqueous solutions of potassium laurate has been plotted and is shown to be dependent on the presence of micelles in the soap solution.

EFFECT OF ADDITIONS OF ORGANIC COMPOUNDS ON THE VELOCITY OF THE PROCESS OF SOAP FORMATION. I. EFFECT OF ADDITIONS OF AROMATIC HYDROXY COMPOUNDS ON THE VELOCITY OF SAPONIFICATION OF COTTONSEED OIL WITH CAUSTIC POTASH (EFFECT OF PHENOL). B. A. Rashkovan and V. M. Lebedeva. *Zhur. Obshchei Khim.* (J. Gen. Chem.) 20, 253-7 (1950). II. CATALYTIC EFFECT OF AROMATIC HYDROXY COMPOUNDS ON THE VELOCITY OF THE PROCESS OF SOAP FORMATION. *Ibid.* 20, 258-60 (1950). III. CATALYTIC ACTION OF ALIPHATIC ALCOHOLS AND ALDEHYDES ON THE VELOCITY OF THE PROCESS OF SOAP FORMATION. *Ibid.* 20, 261-5 (1950). (*Chem. Abs.* **44**, 5619)

TOILET SOAP. J. M. Vallance and F. V. Wells. *Soap Sanit. Chemicals* 27, No. 9, 32-5, 139, No. 10, 47-8, 133, 135, No. 11, 46-9, 143 (1950). Extensive review article covering changes in formulation of toilet soaps in the past 50 years due to the changes in supply of raw materials, milling and plodding of toilet soaps, incorporation of additives, and problems involved in cutting, stamping, and wrapping.

PATENTS

CONTINUOUS SEPARATION OF SOAP. Ronald Vincent Owen (Lever Brothers Co.). *U. S. 2,525,936.* A continuous process of separating nigre and neat soap from molten fitted soap in the absence of centrifuging, which comprises maintaining a continuous and substantially horizontal quiescent flow of fitted soap in a shallow stream forming, by action of gravity, an upper phase of neat soap and a lower phase of nigre, continuously and selectively withdrawing the upper phase and the lower phase.

TOILET SOAP PRODUCTION. John Karl Oskar Hubert Holmberg. *British 643,852.* Preparation of toilet soap by saponification of alcoholic fatty acid esters with alkali in presence of diluent, which is volatilized during process resulting in a directly milleable soap.

SULFONATED ALKANE DETERGENTS. California Research Corporation. *British 645,129.* Preparation of a sulfonated synthetic detergent from new sulfonated phenyl-substituted alkanes containing from 12 to 15 C atoms.