molecular distillation. However it turned yellow in a short time even if stored in evacuated ampules.

The specific extinction coefficients of the arachidonic acid which had been subjected to molecular distillation were used to calculate the equations given in Table III. The background corrections given by Brice *et al.* (3) were used. The percentage of oleic and saturated fatty acids can also be calculated as described by these workers.

TABLE III

Equations Suggested for Use in Analysis of Mixed Polyunsaturated Fatty Acids

$$\% \text{ linoleic acid} = 1.13\ k_2 - 1.13\ k_3 - 0.43\ k_4$$
$$\% \text{ linolenic acid} = 1.88\ k_3 - 2.51\ k_4$$
$$\% \text{ arachidonic acid} = 3.60\ k_4$$

Summary

The presence of nonsaponifiable material in lipids can cause appreciable differences in calculated mixed fatty acid content. The error can be appreciable in lipids extracted from liver unless a saponification and extraction procedure is included in the method. Skin, gizzard, and depot fats do not contain high concentrations of nonsaponifiable material. However chicken skin fat contains a yellow pigment which absorbs ultra violet radiation. This pigment, while not present in a large amount, can still cause errors in the spectrophotometric analysis. It can best be separated from the mixed fatty acids by distillation of the methyl esters.

The equations developed by previous workers have been recalculated on the basis of an arachidonic acid of 99.3% purity. These equations are suggested for use in the spectrophotometric analysis of unsaturated fatty acids.

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ABSTRACTS . . . . Don Whyte, Editor

• Oils and Fats

A. R. Baldwin, Abstractor

REMARKS ON THE PRODUCTION OF OIL FROM ALMONDS. F. Wittka and F. Muscari Tomajoli. *Olearia 4,* 10-19(1950). The almonds were processed so as to obtain direct from the press the maximum yield of oil to be used for food and pharmaceutical uses. The quality of the oil depended on the size of the almonds, on the degree of crushing, and on the temperature.

THE USES OF THE PURGHESE OIL. P. H. Mensier and M. Loury. *Oleagineux 5,* 167-170(1950). Purghese grows readily in poor soils, is reproduced by cuttings and gives a high yield in fats per acre. The purghese oil is toxic so that its industrial use in paints and diesel motor fuel was investigated with only fair success.

RYE ERGOT OIL. J. D. Rodriguez. *Con. sup. Invest. cient., Santiago, 1948,* 1-77. Literature on the pyrolysis and vacuum-distillation of castor oil, ricinoleic acid, tristearin, triolein, and rye ergot oil is reviewed. Although both castor and rye ergot oils contain ricinoleic acid, castor oil gives oenanthal and undecylenic acid, while the latter gives neither. The high optical rotation of rye ergot oil and the discrepancy between glycerol content and ester value indicate partial esterification of the hydroxyl group of ricinoleic acid. Two rye ergot oils of widely different hydroxyl values are distilled and their behaviour is compared: analyses of the oils and their distillation products, and ricinoleic acid balances are presented. Contrary to assumptions made in earlier works, the absence of oenanthal and undecylenic acid from the distillation products of a vegetable oil does not afford proof of the absence of combined ricinoleic acid. Descriptions of all experimental procedures used and a bibliography (94 references) are included. (*Brit Abs.* BII, Sept., 1949, 982.)

THE REFINING OF EDIBLE OILS. H. P. Kaufmann. *Olearia 4,* 5-9(1950). The refining of edible oils so as to obtain from them the so-called "integral oils," i.e., oils that have not been deprived of the valuable substances contained in the original crude oils (vitamines, provitamines, sterols, etc.) is discussed.

RAPESEED OIL. F. Wittka and F. M. Tomajoli. *Olearia 3,* 578-88(1949). Review of the composition and characteristics of rapeseed oil, particularly its nonglyceride constituents; also the production, refining, and hydrogenation processes and its uses (illumination, lubrication, and preparation of factice). (*Chem. Abs. 44,* 1269.)

OLIVE OILS OF NORTHERN ITALY AND SARDINIA. C. C. Buzi (Imperia, Italy). *Ann. sper. agrar.* (Rome) [N.S.] *3,* Fasc. straordinar., 409-49(1949). Tables of data are given for 137 samples of olive oil from the harvests of 1932 to 1939. The effect of the locality, condition at harvest, and quality of the pressing operations obscured the effects of varietal differences. (*Chem. Abs. 44,* 2261.)

OLIVE PRODUCING COUNTRIES HOLD CONFERENCE IN MADRID. Anonymous. *Foreign Crops and Markets 60,* 196-7(1950). A conference of the General Committee of the International Oil Culture Federation was held at Madrid, February 10-15, 1950. The keynote of the conference was the justification for an international accord for world protection of olive oil. Five committees were named to study the situation and to draft resolutions toward such an international agreement.

CHEMISTRY OF CASTOR OIL. Andrea Paleni. *Olearia 3,* 733-46 (1949). Review with 20 references. (*Chem. Abs. 44,* 1267.)

SULFUR COMPOUNDS FROM THE OIL OF THE SEEDS OF CRUCIFERS. E. Andre. *Ann. nutrition et aliment. 3,* 329-34(1949). Oil from seeds of *Brassica napus* var. *oleifera* contains about 1 part sulfur per thousand; odor in oils, such as of *Br. rapa* var. *oleifera* may be due to methyl-mercaptans. (*Chem. Abs. 44,* 2262.)

THE PROPERTIES OF ALKALINE SALTS OF FATTY ACIDS. I. MOISTENING CAPACITY AND CAPILLARY ACTIVITY. E. Otero Aenlle, R. Cadorniga Carro, and S. Pomares Boix. *Anales de fis. y quim.* (Madrid) *45,* (B), 1337-1361 (1949). The moistening capacity, the foaming capacity, and the capacity of carrying away substances by the foam for the alkaline salts of fatty acids is discussed. The capillary activity of each compound as well as the phenomena that involves the existence of an anionic colloidal electrolyte in the solution, determines the variations of the moistening capacity. The moistening capacity of sodium and potassium salts of caproic, caprilic, butyric, stearic, palmitic, and oleic acid determined at 0.1% concentration. These values are compared with those obtained in the determinations of the surface tension of these solutions. The influence of the salt-forming cation and of the addition of sodium hydroxide, electrolytes, and alcohol on the moistening capacity shows that the variations observed are not reflected in the surface-tension values measured. An explanation based on the formation of micellar aggregates above the critical concentration is given.

VISCOSITY OF LOW-MOLECULAR ESTERS WITH BRANCHED CHAINS. H. Staudinger, G. Bier, and G. Lorentz (Univ. of Freiburg, Germany). *Makromol. Chem. 3,* 251-80(1949). The influence of side chains on the viscosity of a large number of low-mol. esters was studied. (*Chem. Abs. 44,* 2443.)

THE NORMAL BUTYRIC ACID MOLECULE AND ITS HYDROGEN LINKAGE. M. Freri. *Atti accad. natl. Lincei, Classe sci. fis., mat., e* *nat.* [8], *5*, 161-4(1948). Anomalous absorption in the infrared region indicates that butyric acid has a double mol., the mols. being joined with the H of one carboxyl group and the O of the CO group in the other. (*Chem. Abs. 44*, 1407.)

DIELECTRIC BEHAVIOR OF METHYL PALMITATE. W. Jackson (Imperial Coll. of Sci. and Tech., London). *Nature 164*, 486-7 (1949). Measurements of the complex permittivity at 20.8 ± 0.3° over the frequency range 50-5 times 10^{10} cycles/sec. on recrystallized methyl palmitate are reported. Dielectric loss almost disappears at the low-frequency end of the spectrum. (*Chem. Abs. 44*, 2302.)

THE ADSORPTION OF FATTY ACIDS ON CARBON BLACKS. CALCULATION OF PARTICLE SIZE. H. A. Smith and R. B. Hurley (Univ. of Tennessee). *J. Phys. and Colloid. Chem. 53*, 1409-16(1949). A study has been made of the adsorption of fatty acids on carbon blacks. If the assumption is made that the acid is always adsorbed with its carboxyl group on the carbon black and the hydrocarbon chain extended away from the surface, the same number of moles of each fatty acid should be adsorbed on a given surface when the monolayer is completed. This is not the case. Some of these acids are adsorbed on the carbon surface in such a manner that their effective cross sections are much greater than 20.5 square Angstroms. The effective cross section of the molecule also depends on the solvent used.

OPTICALLY ACTIVE HIGHER ALIPHATIC COMPOUNDS. V. SYNTHESIS OF THE DEXTROROTATORY DIASTEREOISOMERS OF 2,9-DIMETHYLTETRACOSANOIC ACID. S. Stallberg-Stenhagen. *Arkiv Kemi 1*, 187-96(1949). Stereoisomers of 2,9-dimethyltetracosanoic acid were prepared to check the opinion of Cason and Prout on the structure of phthioic acid. (*Chem. Abs. 44*, 1408.)

HYDROGENATION OF METHYL β-ELEOSTEARATE. M. L. Woltemate and B. F. Daubert (Univ. of Pittsburgh). *J. Am. Chem. Soc. 72*, 1233-6(1950). Data on the solvent hydrogenation of methyl β-eleostearate are reported. *Trans*-11,12-octadecenoic acid (vaccenic) was isolated from the products of hydrogenation and its structure and configuration confirmed.

THE SYNTHESIS OF HIGHER ALIPHATIC β-KETO ACIDS. M. A. Mitz, A. E. Axelrod, and K. Hofmann (Univ. of Pittsburgh). *J. Am. Chem. Soc. 72*, 1231-2(1950). A practical procedure for the synthesis of higher β-keto acids was developed and applied to the preparation of a number of these compounds including 3-keto-$\Delta^{11,12}$-eicosenoic acid (oleoylacetic acid). Methyl 3-keto-$\Delta^{11,12}$-eicosenoate was found to be as active as methyl oleate in replacing biotin in the nutrition of *Lactobacillus arabinosus.*

RICINOLEIC ACID. I. ISOLATION OF THE PURE ACID FROM CASTOR OIL FATTY ACIDS. F. Hawke (Johannesburg). *J. S. African Chem. Inst.* (N.S.), *2*, 1-5(1949). Ricinoleic acid was isolated from saponified and hydrolyzed castor oil by low temperature crystallization from dry acetone. The samples of acid were 99.4 and 99.1% pure calculated from hydroxyl values. The solubility in dry acetone at —70° is 0.38 g./100 ml. (*Chem. Abs. 44*, 2771.)

HIGHER FATTY ACYLOINS AND SOME DERIVATIVES. II. F. Bouquet and C. Paquot. *Bull. soc. chim. France 1949*, 440-1. The following unsaturated acyloins and their derivatives were prepared: oleoin or hexatriaconta-9,27-dien-18-ol-19-one, m. 27° (2,4-dinitrophenylosazone, m. 31-2°); hexatriaconta-9,27-diene-18,19-dione, m. 34°; hexatriaconta-9,27-diene-17,19-diol, m. 78°; and similarly, erucoin (tetratetraconta-9,35-dien-22-ol-23-one), m. 49° (2,4-dinitrophenylosazone, m. 43°); tetratetraconta-9,35-diene-22,23-dione, m. 50°; tetratetraconta-9,35-diene-22,23-diol, m. 88°. Lead tetraacetate in benzene and under nitrogen reacts with these acyloins to give aldehydes in only 25% yield, but 90% yields are obtained by shaking 2 g. of the corresponding glycol in 20 cc. anhydrous benzene 0.5 hr. at room temp. with the theoretical amount of lead tetraacetate and precipitating the lead with 2 N H_2SO_4; lauraldehyde, m. 29° (2,4-dinitrophenylhydrazone, m. 103°); olealdehyde (liquid) (2,4-dinitrophenylhydrazone, m. 48°); erucaldehyde, m. 24° (2,4-dinitrophenylhydrazone, m. 65°). (*Chem. Abs. 44*, 1029.)

THE FORMATION OF HYDROCARBONS BY HYDROGENATION OF FATS. B. B. A. Hosman, J. Van Steenis, and H. I. Waterman (Univ. Delft, Netherlands). *Rec. trav. chim. 68*, 939-44(1949). Hydrogenation of a fat with 20% Ni, or an 18% Ni-0.1% Cu catalyst under 200 atms. pressure at 250-395° yielded unbranched paraffins containing one less C than the original fatty acids. (*Chem. Abs. 44*, 2771.)

SYNTHETIC FATTY ACID PRODUCTS FROM THE OXIDATION OF PARAFFIN. G. Wietzel. *Farben, Lacke, Anstrichstoff 3*, 416-19 (1949). Oxidation by air at 110° under pressure, in the presence of catalysts such as $KMnO_4$, of paraffin gatsch (b.p. 320-450°) from the Fischer-Tropsch process, or of paraffin produced from low-temp. hydrogenated lignite gasification tar, produces a spectrum of fatty acids from formic to that equal in chain-length to the starting material. To prevent formation of undesirable keto and hydroxy acids, the conversion is only carried to ⅓. The reaction water containing the soluble acids is then removed, the fatty acids separated after saponification with alkali, distilled to remove the balance of the unsaponifiables, the soaps acidified, and the fatty acids fractionated under vacuum. The products obtained are forerun acids (C_5-C_9), 10-15%; center cut (C_{10}-C_{18}), about 45%; tail cut (C_{18} and up), 5-10%; and residue of polymerized acids, 7-15%. The forerun acids are used in plasticizers, perfumery, flotation and certain alkyds, and after transformation to alcohols in plasticizers, solvents, and surface active agents. The center cut acids are used in soap, as food after esterification with glycerol, in Buna rubber, and for hydrogenation to fatty alcohols. The tail cut acids are useful in lubricating oils, mold lubricants, and in rubber. The residue acids are useful raw materials for the paint industry. (*Chem. Abs. 44*, 2260.)

EMULSIFIERS. T. Ruemele. *Seifen-Ole-Fette-Wachse 75*, 416-17(1949). A discussion of the various types of emulsifiers including their trade names. (*Chem. Abs. 44*, 1270.)

POLYMERIZED PRODUCTS FROM CASTOR OIL. O. Prakash, T. R. Sharma, and D. Y. Athawale. *J. Sci. Ind. Research* (India) *8B*, 180-3(1949). Polymerized products of varying consistencies and melting points have been prepared from castor oil with selenium as catalyst and their properties studied. The products can be refined to neutral, colorless, odorless products which can be used as substitutes for petroleum jelly, as a wax in leather dressing and sizing, and as a lubricating grease. (*Chem. Abs. 44*, 2772.)

A NEW PROCESS FOR THE CHEMICAL REFINING OF GLYCERIN. S. Grasso. *Olearia 3*, 885-887(1949). The author describes a new economical and rapid process for refining crude glycerin by the use of sulfuric acid and barium hydroxide.

THEORETICAL CONSIDERATIONS OF OIL PRODUCTION BY PRESSING. M. Singer. *Seifen-Ole-Fette-Wachse 75*, 49-51, 67-9(1949). The physical, chemical, and physical-chemical processes in the pretreatment of oil seeds and pressing of oil from them are described. (*Chem. Abs. 44*, 1267.)

CONTRIBUTION TO THE IMPROVEMENT OF THE EXTRACTION OF OIL FROM OLIVE-CAKE. C. Berti. *Olearia 3*, 629-38(1949). The advisability of replacing carbon disulfide by n-hexane in the extraction of oil from olive-cake is discussed from the point of view of operation (batch or continuous), safety, further refining, solvent recovery, and quality of the oil. (*Chem. Abs. 44*, 1269.)

EXTRACTION OF PALM OIL BY THE PROCESS OF DRY EXTRACTION. R. Wilbaux. *Olearia 3*, 374-82(1949). The various methods of palm oil extraction are reviewed and results obtained are given in an experimental oil-mill processing 1 ton of palm fruit per hour by dry centrifugal treatment. The dry centrifugal process is found to be a simple, practical method assuring good yields. (*Chem. Abs. 44*, 1269.)

SPECIAL METHODS OF OIL PRODUCTION AND THEIR PRACTICAL SIGNIFICANCE. M. Singer. *Seifen-Ole-Fette-Wachse 75*, 451-2, 472-3(1949). Review of 6 processes for oil production from various seeds. (*Chem. Abs. 44*, 1267.)

REFINING AND APPLICATION OF VEGETABLE OILS. S. R. Steinbock. *Can. Chem. Process Inds. 34*, 28-35(1950). Alkali-refining, bleaching, hydrogenation, and deodorization of vegetable oils are described. Processing oils for the paint or varnish industries, solvent extraction with furfural, and liquid propane are included.

INDUSTRIAL OIL AND FAT CHROMATOGRAPHY. H. Weil. *Paint Technol. 14*, 391-9, 439-53(1949). A review with 220 references. (*Chem. Abs. 44*, 1267.)

PURINA'S NEW IOWA FALLS PLANT. K. McCubbin, G. J. Ritz, and H. L. Barnebey (Blaw-Knox Co.). *Soybean Dig. 10* (5), 24-27 (1950). The new basket type extraction plant installed at this location is described.

WORLD PRODUCTION OF FATS AND OILS EXCEEDS PREWAR. Anonymous. *Foreign Crops and Markets 60*, 188-92(1950). World production of various fats and oils are given. A total of 44 billion pounds of fats and oils were produced in 1949. This is 400 million pounds above the 1935-39 average.

WORLD PRODUCTION OF FATS AND OILS EXCEEDS PREWAR. *Foreign Agriculture Circular, FFO 4-50*, Office of Foreign Agriculture Relations (U.S.D.A.) March 6, 1950. World production of all fats and oils in 1949 was 44 billion pounds, up 5% over 1948. In general, 1949 saw the end of the acute shortage in the world's supply of fats and oils. The supply is still short compared with the per capita level of consumption before the war. On the basis of population increases alone the over-all world deficit is about 4 billion pounds. A summary of the production for the various fats and oils is given.

ON THE ANALYTICAL STANDARD METHODS OF TESTING FATS AND THEIR DERIVATIVES. III. G. B. Martinenghi. *Olearia 3,* 888-891(1949). A critical comparison of the analytical standard methods for the control of fatty substances of the A.O.C.S. ("American Oil Chemists' Society") and those of the N.G.C. ("Norme Italiane per il Controllo dei Grassi e Derivati") for determining the oil content of cakes and meals, with special reference to grinding, to the equipment, and to the duration of the extraction.

STANDARD ANALYTICAL METHODS FOR TESTING FATS AND THEIR DERIVATIVES. G. B. Martinenghi. *Olearia 3,* 725-32(1949). The methods of the American Oil Chemists' Society and the Norme Italiane per il Controllo dei Grassi e Derivati (N.G.D.—1942) are compared and proposals for amending the Italian methods are advanced. (*Chem. Abs. 44,* 1267.)

SAPONIFICATION METHODS (FATS). Herbert Manneck. *Seifen-Ole-Fette-Wachse 75,* 111-13(1949). Review with 20 references. (*Chem. Abs. 44,* 1267.)

RAPID DETECTION OF ADULTERATION OF FATTY OILS WITH MINERAL OIL. P. Mendritzki (Verden/Allen, Germany). *Süddeut. Apoth.-Ztg. 89,* 973(1949). Saponification of the sample with alcoholic KOH for 30 minutes and dilution with water yields a milky solution if 10% or more mineral oil is present. (*Chem. Abs. 44,* 2772.)

THE DETERMINATION OF DISSOLVED OXYGEN (IN HYDROCARBON OILS). J. H. D. Hooper (Anglo-Iranian Oil Co.). *Proc. Am. Petroleum Inst., Sect. III, 28,* 31-9(1948). The method should also be applicable to fatty oils. In an all-glass system, the dissolved gas is removed from a known weight of sample by agitation under reduced pressure in a special degassing vessel at 100°. The extracted gas is measured in a buret and transferred to a Haldane apparatus for the determination of oxygen. (*Chem. Abs. 44,* 2736).

MODERN ANALYTICAL CHEMISTRY; ITS REPERCUSSIONS IN THE FAT INDUSTRY. J. P. Wolff *Bull. mens. ITERG 3,* 418-27(1949). Colorimetric, potentiometric, and polarographic methods are reviewed together with reactions based on oxidation-reduction and the formation of complexes.

ESSENTIAL OILS AND RELATED PRODUCTS. E. Gunther and E. E. Langenau (Fritzsche Brothers, Inc.). *Anal. Chem. 22,* 210-15 (1950). Second annual review of analytical methods on the subject. 93 references.

SENSITIVE METHOD FOR THE DETERMINATION OF PEROXIDES OF FATS AND FATTY ACIDS. S. Hartmann and J. Glavind (Copenhagen). *Acta Chem. Scand. 3,* 954-8(1948). 3,5-Dichloro-4,4-dihydroxyphenylenediamine reacts with peroxidized fats dissolved in an organic solvent when heated for 10 minutes in a boiling water bath. The resulting dichlorophenolindophenol is determined colorimetrically at 520 mμ. (*Chem. Abs. 44,* 2771.)

COLORIMETRIC MEASUREMENT OF THE DEGREE OF OXIDATION OF FATS AND OILS. F. Pallauf. *Seifen-Ole-Fette-Wachse 75,* 51-2 (1949). The method of Fonrobert and Pallauf (*C.A. 20,* 2421) is applied to fats and oils saponified with 10 times their volume 0.5 N alcoholic KOH to determine the color on saponification; this increase in color is an indication of the rancidity of fats and their content of hydroxy acids. (*Chem. Abs. 44,* 1267.)

DETERMINATION OF AUTOXIDATIVE PROCESSES IN FATS AND OILS. H. P. Fiedler. *Seifen-Ole-Fette-Wachse 75,* 89-92, 109-10 (1949). Review of the chemistry of the autoxidation of fats, determination of peroxides, determination of susceptibility to oxidation, and prevention of autoxidation by antioxidants. 50 references. (*Chem. Abs. 44,* 1267.)

A NEW APPARATUS FOR MEASURING THE OXIDATION OF FAT. M. T. Mellier. *Ann. nutrition et aliment. 3,* 447-50 (1949). In the apparatus described, oxygen as it is absorbed by the oxidizable compound studied, is automatically compensated by means of a copper sulfate electrolytic cell, which is electrically connected to an identical cell, evolving that same amount of oxygen into a volumetric column. (*Chem. Abs. 44,* 2259.)

PATENTS

WATERPROOFING MINERAL WOOL. J. H. Zettel (Johns-Manville). *U. S. 2,493,845.* Oleaginous liquid is mixed with the fibers and a water repellent powdered material such as waxes, fatty acids, or soaps is sprinkled into the mixture to make the material water repellent.

ALUMINUM STEARATE SOLUTION. J. Cunder and F. J. Licata (Nopco Chem. Co.). *U. S. 2,494,331.* A free flowing composition consisting of aluminum stearate and an alkyl phosphate dissolved in a terpene, hydrocarbon, or chlorinated hydrocarbon solvent.

PROCESS FOR TREATING LIPOIDAL MATERIAL. R. H. Sifferd and J. D. Porsche (Armour and Company). *U. S. 2,494,726.* The process of separating a glycolipid from a composition containing it in mixture with a sterol which comprises subjecting said composition to contact with ethylene dichloride in the presence of moisture, and separating an aqueous phase containing said glycolipid from an ethylene dichloride phase containing said sterol.

DUSTING AND POLISHING PAPER. H. I. Jones (Munising Paper Company). *U. S. 2,495,066.* A combined dusting and polishing paper comprising a size- and filler-free absorbent paper sheet characterized by high wet and dry strength and high oil and water absorbency and having uniformly distributed therein a mineral oil; a flexibilizing agent consisting of a polyhydric alcohol; and minor amounts of a long chain fatty acid partial ester of a hexitol anhydride, a polyoxyalkylene derivative of a long chain fatty acid partial ester of a hexitol anhydride, and a polyoxyalklyene derivative of a long chain fatty acid monoester of a glycol.

CACAO BUTTER IN BUTYL RUBBER HEAVILY LOADED WITH BLACK. S. R. Harrison and R. M. Hill (The Firestone Tire & Rubber Co.). *U. S. 2,495,099.* A cured high carbon, flexible, rubbery composition which contains 100 parts of the rubbery polymerization product of isobutene polymerized in the presence of 1 to 10% of a diolefin, 100 to 200 parts of reinforcing carbon black, and from 2 to 15 parts of cacao butter.

PREPARATION OF CARBOXYLIC ACID ANHYDRIDES. W. F. Gresham and R. E. Brooks (E. I. du Pont de Nemours & Co.). *U. S. 2,497,304.* A process for the synthesis of carboxylic acid anhydrides which comprises reacting under anhydrous conditions a carboxylic acid with a hydrocarbon containing non-aromatic monoolefinic unsaturation, and carbon monoxide, at a temperature within the range of 200 to 500°, under a pressure of 25 to 2000 atmospheres, in the presence of a nickel-containing catalyst of the class consisting of nickel carbonyl and substances which produce nickel carbonyl under the conditions of the reaction.

PREPARING VITAMIN ENRICHED OIL. W. D. McFarlane (Victory Mills Ltd., Toronto, Can.). *U. S. 2,497,317.* The process for preparing a vitamin E enriched oil by extracting the wheat germ with a boiling alcohol-water solvent containing 88-92% alcohol; cooling the extract to a lower temperature at which a major portion of the oil is thrown out of solution; separating the major portion from the cooled extract; removing the solvent from the cooled extract by evaporation; taking up the resulting residue by hot water and centrifuging to produce a lipoid phase and an aqueous phase, separating and drying the lipoid phase, and extracting the same with acetone, separating the extract and evaporating the remaining acetone from the solution to produce a vitamin E enriched oil containing the bulk of the vitamin E content of the original wheat germ.

METHOD FOR PRODUCING OIL AND MEAL FROM FISH OFFAL. Olav Notevarp (Aktieselskapet Stord, Lervik, Norway). *U. S. 2,497,367.* Method of producing fishmeal and oil from fish comprising reducing the moisture content of the fish to the range of 40 to 55% of moisture, pressing the fish material after proper heating to remove a liquid containing the oil and then drying the pressed fish residue.

COUNTERCURRENT EXTRACTION APPARATUS. O. R. Sweeney and L. K. Arnold (Iowa State College Research Foundation). *U. S. 2,497,700.* Apparatus for the solvent extraction of an extractable material, comprising a casing providing a chamber in the general shape of a loop, a portion of said loop providing an extraction chamber and having an inlet for the introduction of liquid solvent and an outlet for withdrawing the oil-bearing solvent, a drier enclosing another portion of chamber loop which is above solvent level, and an endless conveyor extending through looped chamber to carry extractable material.

OBTAINING STEROLS OF HIGH PURITY. H. A. Vogel and R. M. Christensen (Pittsburgh Plate Glass Co.). *U. S. 2,499,430.* Sterol concentrates dissolved in naphtha are extracted with furfural to remove the sterols. The furfural is then removed by distillation to leave the sterol in 90 to 100% purity.

ISOPROPYL PALMITATE SOLUTION OF LANOLIN COSMETIC. J. R. Verblen (Lanolin Plu Cosmetics, Inc.). *U. S. 2,498,727.* A thin stable homogeneous solution of 35 parts of lanolin dissolved in from 53 to 65 parts of isopropyl palmitate, said solution characterized by such extremely low viscosity that a small amount of solution applied to the skin transfers a substantial amount of lanolin for distribution over a comparatively wide area.

METHOD OF SEPARATING MIXTURES OF TOCOPHEROLS. M. L. Quaife (Eastman Kodak Co.). *U. S. 2,499,778.* A mixture containing α-, β-, and γ-tocopherols is nitrosated, thus making a nitrosated derivative of the tocopherol having an unsubstituted position on the aromatic ring. This compound is separated from the unreacted products by chromatographic adsorption. The separated nitrosated derivative is then reduced and deaminated to regain the original tocopherol.

METHOD OF CONCENTRATING VITAMINS BY SOLVENT FRACTIONATION. J. T. Dickinson, O. Morfit, and L. J. Van Orden (M. W. Kellogg Co.). *U. S. 2,499,991.* Vitamins A and D are extracted in concentrated form from their parent oils by the "Solexol" process using liquid propane near its critical temperature.

MIXED FATTY ACID AND ROSIN ESTERS OF RESINOUS EPOXIDES. L. G. Montague (Devoe & Raynolds Co., Inc.). *U. S. 2,500,765.* Resinous compositions which are mixed long-chain unsaturated vegetable oil fatty acid and rosin esters of high molecular weight resinous epoxides containing hydroxyl groups.

ACYLATING OF HYDROXYLATED ESTERS. L. F. Reuter and Aldrich Syverson (The B. F. Goodrich Co.). *U. S. 2,500,918.* A process of acylating castor oil with a saturated monobasic fatty acid anhydride containing from 4 to 8 carbon atoms, by introducing vapors of said anhydride into preheated castor oil and maintaining the resulting liquid-vapor mixture for a period of time sufficient for substantial completion of reaction (less than 20 minutes).

PURE SATURATED FATTY ACIDS AND THEIR ESTERS (CONVERSION OF CASTOR AND OTHER HYDROXY ACID OILS TO STEARIC ACID). Abril Corp. and G. Patrick. *British 627,531.* Hydroxy acid-bearing oils, such as castor oil, or ivory wood oil are converted to stearic acid or its esters by three steps: (1) Hydrogenation of the oil to saturated esters; (2) Dehydrogenation to isoöleic esters; (3) Rehydrogenation to esters of stearic acid, which may be split to free acid and then reësterified. (*Chem. Abs. 44,* 1726.)

HARDENING FATTY OILS BY ELAIDINATION. W. K. Sijpesteijn, Jr. *British 627,742.* Peroxide-free fatty oils are hardened by treatment with sulfur dioxide at 50-150° in an inert solvent. The solution is cooled and the elaidinized oil is separated by filtration.

IMPROVEMENTS IN THE MANUFACTURE OF THE HIGHER FATTY ACID ESTERS OF POLYCHLORINATED PHENOLS. E. B. Higgins. *British 628,824.* Phenol is chlorinated with or without the aid of a catalyst in the presence of a fatty acid and the mixture treated with $POCl_3$ to form the ester. (*Chem. Abs. 44,* 1727.)

DECOLORIZATION, DEODORIZATION, AND STABILIZATION OF ORGANIC COMPOUNDS, SUCH AS GLYCEROL. J. Vandoni and R. Lavacchielli. *Italian 434,146.* Organic substances with no double bonds easily hydrogenable can be freed from undesirable unsaturated substances or ketones or aldehydes by catalytic hydrogenation. (*Chem. Abs. 44,* 2015.)

GLYCERIDE MIXTURE CONTAINING THE MONO- AND DIGLYCERIDES OF LABILE, POLYUNSATURATED ACIDS. F. Grün-Schweizer. *Swiss 260,852.* Liquid horse fat is converted to the mono- and diglycerides by treatment with glycerol and tin at elevated temperature in the absence of oxygen. (*Chem. Abs. 44,* 2265.)

OBTAINING A MIXTURE OF LABILE, POLYUNSATURATED ACIDS. F. Grün-Schweizer. *Swiss 261,214.* Linseed oil is split enzymatically with pancreatin at pH 8.2 or with the ferment of castor beans. (*Chem. Abs. 44,* 2264.)

STABILIZER FOR (FAT-SOLUBLE) VITAMINS. T. Hosoda. *Japan 174,330.* The squalene fraction, b_{15} 230-55°, from unsaponifiable substance of shark liver oil is added to fat-soluble vitamins. (*Chem. Abs. 44,* 1234.)

• Biology and Nutrition

A. R. Baldwin, Abstractor

DIFFERENCE IN INTESTINAL ABSORPTION BETWEEN VITAMIN A ALCOHOL AND ESTER. H. Popper, F. Steigmann, and H. A. Dyniewicz. *Proc. Soc. Exp. Biol. and Med. 73,* 188-90(1950). The plasma vitamin A level of hospital controls and patients with liver diseases was, as a rule, slightly more elevated after the intake of equal doses of vitamin A esters than of the alcohol.

CHROMATOGRAPHIC ESTIMATION OF CAROTENE IN FEEDS AND FEED PRODUCTS. M. L. Cooley and R. C. Koehn (General Mills). *Anal. Chem. 22,* 322-6(1950). A rapid method for the estimation of chromatographic carotene in alfalfa meal, corn, corn products, and finished feeds is described. The use of a combination of three solvents (toluene, ethyl alcohol, and ethyl acetate) results in improvement in the completeness of extraction of carotenoid pigments. The method estimates the total concentration of all the known vitamin A-active carotenoids.

CAROTENOIDS FROM PALM OIL AND THEIR POSSIBLE USES. P. Blaizot. *Ann. nutrition et aliment. 3,* 455-8(1949). The liquid oil extracted from palm is colored red by a mixture of xanthophylls, lycopene, and carotenes (mostly alpha), with some beta and gamma cryptoxanthene. (*Chem. Abs. 44,* 2261.)

ELEVATION OF HUMAN ADAPTATION TO DARKNESS WITH CAROTENOIDS. G. v. Studnitz and H. K. Loevenich. *Klin. Monatsbl. Augenheilk. 111,* 193-210(1945-6). Lutein dipalmitate was prepared from *Tagetes patula flore pleno* flower meal. Rod and immediate adaptation increased in proportion to the dosage of the ester. In contrast to vitamin A treatment, discontinuation caused its effect to diminish only slowly in 1-4 months. (*Chem. Abs. 44,* 2096.)

CHOLESTEROL AND PHOSPHATIDE IN THE STARVING MOUSE. G. Schettler (Tübingen Med. Univ., Germany). *Arch. ges. Physiol.* (Pflügers) *251,* 398-403(1949). With water but no feed, mice lost ⅓ of liver weight in 6 days. Liver total cholesterol rose from 391 to 732 mg. % on the second day and dropped to 303% by the sixth day. Phosphatides appeared to drop with the liver drop in weight and remained nearly constant at 3.1 to 3.9 g. %. (*Chem. Abs. 44,* 2607.)

EFFECT OF CHOLESTEROL ON ANTIGENICITY OF STREPTOLYSIN O. G. S. Turner and E. I. Pentz (Northwestern Univ. Med. School). *Proc. Soc. Exp. Biol. and Med. 73,* 169-71(1950). The observation of Hewitt and Todd that cholesterol neutralizes the hemolytic activity of streptolysin O is confirmed.

THE EXTRAHEPATIC SYNTHESIS OF CHOLESTEROL. P. A. Srere, I. L. Chaikoff, S. S. Treitman, and L. S. Burstein (University of California, Berkeley). *J. Biol. Chem. 182,* 629-34(1950). Functionally hepatectomized rats can convert acetate to cholesterol. In addition to liver and adrenal, the kidney, testis, small intestine, and skin of the adult rat are capable of converting acetate to cholesterol. The brain and skin of the new born rat also synthesized cholesterol. Surviving brain slices of adult rats completely failed to convert acetate to cholesterol.

CHOLESTEROL ESTERASES. II. CHARACTERIZATION OF ESTERIFYING CHOLESTEROL ESTERASE OF PANCREATIN. L. Swell and C. R. Treadwell (George Washington University). *J. Biol. Chem., 182,* 479-87(1950). A substrate mixture, containing cholesterol and oleic acid suitable for quantitative studies of the esterifying cholesterol esterase, has been devised. The enzyme from commercial pancreatin required bile salts and a fatty acid source for activity. There was a sharp optimum in the pH-activity curve at 6.2.

ACTION OF LECITHIN AND CHOLESTEROL AT THE OIL-WATER INTERFACE. P. Blanquet and J. Duhamel (Univ. Bordeaux, France). *Bull. soc. chim. biol. 31,* 716-18(1949). Lecithin markedly lowers the olive oil-water interfacial tension; cholesterol has no such effect. (*Chem. Abs. 44,* 1551.)

THE EFFECT OF THE LIPOTROPIC FACTOR OF THE PANCREAS ON LIVER DEPOSIT OF CHOLESTEROL. N. A. Isichenko. *Arkh. Patol. 11,* (4), 48-52(1949). Rat diet rich in sunflower oil does not increase liver cholesterol even if the diet is deficient in lipotropic substances. Addition of 15-60 mg. of the pancreatic factor has little effect and only at the 120-mg. level does liver cholesterol begin to decline. Diet containing 2% cholesterol (alipotropic) causes a rise of liver cholesterol, but even 15-45 mg. doses of pancreatic factor cause it to drop. (*Chem. Abs. 44,* 1584.)

INFLUENCE OF OBESITY ON THE DEVELOPMENT OF ARTERIOSCLEROSIS IN THE HUMAN AORTA. M. Faber and F. Lund. *Arch. Path. 48,* 342-50(1949). In 400 human aortas, the dry weight, cholesterol, and calcium contents rose normally with age, and abnormally in hypertension. Obesity, however, did not cause abnormal changes. (*Chem. Abs. 44,* 1594.)

THE HUMAN AORTA: SULFATE-CONTAINING POLYURONIDES AND THE DEPOSITION OF CHOLESTEROL. Mogens Faber. *Arch. Path. 48,* 342-50(1949). Human aortas showed increased cholesterol and sulfate contents with advancing age. (*Chem. Abs. 44,* 1594.)

STEROIDS. XXVIII. PATIRIASTEROL FROM STARFISH IN JAPAN. S. Kuwanda and S. Ban. *J. Pharm. Soc. Japan 69,* 212-15 (1949). Patiriasterol was isolated from *Patiria pectinifera,* Muller and Trochel. (*Chem. Abs. 44,* 2001.)

CONSTITUENTS OF BILE FROM MARINE ANIMALS. A. Minato and N. Ikeda. *J. Pharm. Soc. Japan 69,* 345-8(1949). Cholic acid, taurine, and cholesterol were identified in the bile of *Seriola quinqueradiata* belonging to the Teleostei. (*Chem. Abs. 44,* 2003.)

MECHANISM OF THE LIPOTROPIC ACTION OF ESTROGEN. R. A. Shipley, E. B. Chudzik, P. Gyorgy, and C. S. Rose. *Arch. Biochem. 25,* 309-15(1950). The lipotropic effect of estrone appears to depend upon an extrahepatic mechanism through the anterior pituitary gland rather than upon direct hepatic action.

VITAMIN D IN OIL FOR POULTRY-FEEDING PURPOSES (TYPES 200 AND 400). Brit. Standards Inst., London, S.W. 1. Brit. Standard 1581, 1949, 8 pp. 2s. Describes 2 types of oil of potency 200 and 400 B.S.I. units of vitamin D_3 per g. Describes the preparation of the sample and the determination of acidity. The oil should be free of mineral oil acids and the free fatty acids should not exceed 2%. (*Chem. Abs. 44,* 1653.)

MAKING PALM OIL AVAILABLE FOR HUMAN USE. M. Loury. *Ann. nutrition et aliment. 3,* 451-3(1949). Oil from palm kernels yields 35% of an edible oil containing mostly palmitodiolein (m.p. 18°) with oleopalmitostearin and dipalmitoolein and an edible solid fat (m.p. 40°). (*Chem. Abs. 44,* 2261.)

THE UTILIZATION OF SYNTHETIC FATS IN THE HUMAN AND ANIMAL ORGANISM. K. Oberdisse (Med. Univ., Wurtzburg, Germany). *Z. ges. exptl. Med. 114,* 60-74(1944). The fatty acids, obtained in the Fischer-Tropsch synthesis were nearly saturated (I.V. 10-20) and contained even and odd numbers of carbon atoms between C_{10} and C_{20}. In man an average of 6.5%, in dogs 7.9% of a single dose of fat was found in the feces; ⅔ of it was in the form of free fatty acids and soaps. The blood-fat level rose to a maximum in men and dogs 3 hours after feeding. The blood ketone bodies increased 95 and 100% in men and dogs resp., the maximum being reached some time after the maximum fat value. The alkali reserve was not affected. The synthetic fats were as well tolerated as the natural ones. (*Chem. Abs. 44,* 2615.)

INVESTIGATION ON THE NEW ANTIDIABETIC PRINCIPLE (AMELLIN) OCCURRING IN NATURE. VII. ITS ROLE IN THE DIRECT METABOLISM OF FAT IN THE EXPERIMENTAL ANIMALS (ALBINO RATS). M. C. Nath and H. D. Brahmachari (Nagpur Univ., India). *Ann. Biochem. and Exptl. Med. (India) 9,* 13-16(1949). Amellin in daily dose of 25-50 mg./kg. participated in fat metabolism by conversion of saturated fatty acids into the more highly unsaturated. (*Chem. Abs. 44,* 2648.)

THE ACTION OF PANCREATIC LIPOTROPIC FACTOR IN EXPERIMENTAL TOXIC FATTY INFILTRATION OF THE LIVER. S. M. Leites and T. S. Yakusheva. *Arkh. Patol. 11,* (4), 44-8(1949). The fatty liver infiltration caused by carbon tetrachloride injection in guinea pigs and rats was substantially unaffected by the administration *per os* of the pancreatic factor equivalent to 2 g. of tissue, and at the 10-15 g. level even gave some increase of total lipides. Rats, which are less sensitive to carbon tetrachloride and survive the toxic effects more successfully than do the guinea pigs, showed a drop of total liver lipides of some 20% with administration of 0.3-0.5 g. of the pancreatic factor daily; the phospholipide level is constant, and both cholesterol and glycogen decrease slightly. Addition of inositol does not affect the lipide level, nor does insulin lower the lipide level any more than the pancreatic factor. (*Chem. Abs. 44,* 1610.)

THE STIMULATING EFFECT OF DIETARY FAT ON CARCINOGENESIS. R. K. Boutwell, M. K. Brush, and H. P. Rusch (Univ. Wisconsin.). *Cancer Research 9,* 741-6(1949). A diet containing 61% fat and no carbohydrate stimulated growth of carcinomas in mice about the same as diets containing 27% fat and some glucose. The superiority of these diets over a 2% fat diet in stimulating growth of tumors was explained by a greater net energy value. (*Chem. Abs. 44,* 2638.)

PLASMA LIPIDES IN BLOOD DISEASES. L. Chianca and F. Marisco (Univ. Napoli). *Boll. soc. ital. biol. sper. 24,* 867-9(1948). A relation between plasma lipase and activity of the hematopoietic system seems to exist. (*Chem. Abs. 44,* 2632.)

CHANGES IN THE OIL-WATER INTERFACE DURING THE ABSORPTION OF PARTICULATE FAT FROM THE INTESTINE. A. C. Frazer. *Research* (London), Suppl., *Surface Chemistry 1949,* 241-51. Negatively charged fat particles flocculate in the presence of plasma proteins at pH 7.4. Ingested fat is finely emulsified in the small intestine by a system, to which phospholipid is not essential, consisting of fatty acids, bile salts, and monoglycerides. The fat particles pass into the intestinal cell where a change of particle size occurs, especially if the cell is overloaded with fat. During fat absorption phospholipid which seems to play some part in the removal of fat from the cell into the corium of the villus, is formed. Fat particles are then conveyed by lymphatic channels into the blood stream. At the height of fat absorption fat particles remain discrete in the presence of plasma proteins at pH 7.4 and phospholipid now plays an essential role in stabilizing fat particles. The interfacial structure of fat particles seems to undergo a series of changes during fat absorption, related to the changing environment through which they pass. (*Chem. Abs. 44,* 2618.)

STUDIES ON LIPIDES IN THE NERVOUS SYSTEM WITH SPECIAL REFERENCE TO QUANTITATIVE CHEMICAL DETERMINATION AND TOPICAL DISTRIBUTION. G. Brante. *Acta Physiol. Scand. 18,* Suppl. 63, 189 + XXIV pages (1949). There is evidence for the occurrence in the nervous system of lipides (not sphingomyelin) whose phosphorus is difficult to release with potassium hydroxide and of phosphatides containing more than one molecule of glycerol per atom of phosphorus. Hydrolysis with saturated aqueous barium hydroxide liberates all lipide choline. Chloroform extracts prepared from the residue of alcohol-ether extracts from tissue contain contaminants which seriously interfere with the determination of inositol, amino acids, and total lipides. (*Chem. Abs. 44,* 2100.)

FIBRINOLYSIS AND PHOSPHOLIPIDES IN VITRO AND IN VIVO. Th. Halse. *Arch. intern. pharmacodynamie 80,* 444-50(1949). The lytic effect of thrombokinase is related to its lipide content. The lipide effect is nonspecific and probably physical and can be obtained with animal and vegetable lecithin. (*Chem. Abs. 44,* 1604.)

PHOSPHATIDES AS ACCOMPANIMENTS OF FAT IN FOOD-YEAST. W. Diemair and W. Poetsch. *Biochem. Z. 319,* 571-91(1949). Growing food-yeast builds lipids of which one half consists of phosphatides. The material is treated with methanol which denatures the protein moiety of the lipoproteins and makes the phosphatides accessible to the extraction solvents. The phosphatides are separated from the lipid mixture and purified by adsorption on silica gel. In *Torula utilis* there is three times as much choline as colamine, whereas in *Oidium lactis* there is only twice as much choline as colamine (*Chem. Abs. 44,* 2075.)

INVESTIGATION ON RESPIRATION, GROWTH, AND FAT PRODUCTION OF *Rhodotorula Gracilis* WHEN CULTIVATED IN MEDIA CONTAINING DIFFERENT CARBOHYDRATES. N. Nielsen and N. G. Nilsson (Royal Inst. Tech., Stockholm) *Arch. Biochem. 25,* 316-22(1950). Fat formation is possible if xylose is used in the medium.

THE PRESENCE OF OLEIC ACID-REQUIRING DIPHTHEROIDS ON THE HUMAN SKIN. M. R. Oollock, S. D. Wainwright, and E. E. D. Manson. *J. Path Bact. 61,* 274-6(1949). Of 52 apparently different microbial colonies isolated from a small area of skin on the forearm, at least 3 biochemically distinct strains were found that had absolute requirements for oleic acid for growth in a chemically defined medium. All were gram-positive diphtheroids. (*Chem. Abs. 44,* 1564.)

CONDUCTING A TASTE PANEL FOR THE EVALUATION OF EDIBLE OILS. H. A. Moser, H. J. Dutton, C. D. Evans, and J. C. Cowan (Northern Regional Research Laboratory). *Food Technology 4,* 105-9(1950). The development of taste panel methods used to evaluate edible oils is described. The importance of a well organized procedure, the maintenance of interest, and the evalution of panel and individual performance by statistical means is discussed.

KEEPING QUALITY OF FOODS. F. D. Tollenaar. *Centraal Instituut voor Voedingsonderzoek T.N.O. Utrecht. Publication No. 82.* The physical, chemical, micro-, and macro-biological forms of deterioration are discussed. The keeping quality was investigated by means of a keeping test, both practical and accelerated. The correlation between the results of an accelerated keeping test (Swift-test) and a practical keeping test at normal temperature with beef tallow was determined. The fungistatic activity of octyl gallate was investigated.

DETERIORATION IN EDIBLE OILS AND FATS. F. D. Tollenaar. *Centraal Instituut voor Voedingsonderzoek T.N.O. Utrecht. Publication No. 98.* The course of autoxidation in edible fats and oils depends on the composition of the substrate and on the influence of external factors. Autoxidation in the presence of light very often proceeds in a way which is quite different from the course followed by autoxidation in the dark. Antioxidants are divided into three groups: primary antioxidants (which break the reaction chains), synergists (which enhance the effect of the primary antioxidants), and secondary antioxidants (counteracting the effect of pro-oxidants, e.g. metals and peroxides). The effect of the esters of gallic acid on animal fats is compared in the Swift stability test and in actual storage tests. Esters of gallic acid give excellent stabilization results in cod liver oil and in whole-milk powder. Octyl and dodecyl gallate have low acute and chronic toxicity.

FAT DETERIORATION IN BAKED GOODS. F. D. Tollenaar. *Centraal Instituut voor Voedingsonderzoek T.N.O., Utrecht. Publication No. 101.* Many deteriorative changes such as tainting, hydrolysis, ketone rancidity, flavour reversion, and autoxidation occur in edible oils and fats which are not completely covered by the conventional term "rancidity." In baked goods rich in fat, i.e. containing more than 5% fat and less than 10% water, the fat fraction may show flavour reversion and invariably exhibits oxidative deteriorations. Some antioxidants, which are highly active in pure oils and fats, show no effect when applied in baked goods. Promising antioxidants for bakery products are gum guaiac and dodecyl gallate. Generally rancidity is inhibited at higher water contents of the commodities. If light penetrates to the baked goods a special type of fat deterioration ("tallowiness") may occur.

Constituents of shea. J. Pradain. *Ann. nutrition et aliment. 3,* 459-62(1949). Karite butter (shea) is a mixture of fatty acids, phytosterols, latex, B amyrine, basseol, and parkeol. (*Chem. Abs. 44,* 2259.)

Further studies on Canadian lard: phosphorus content, color, and stability. H. J. Lips (Nat. Res. Labs., Ottawa, Canada). *Can. J. Res. (Sec. F) 28,* 21-30(1950). A modified colorimetric procedure showed that phosphorus content of Canadian lard (12 dry rendered samples and 21 wet rendered samples) was generally less than 0.001%, and did not appear to be definitely related to method of rendering or to keeping quality. Color of lard was conveniently measured with the Evelyn photoelectric colorimeter; photoelectric transmission values were most closely related to Lovibond color values in the yellow region. Lovibond color could be predicted only approximately from transmission. No association of color with processing conditions or with keeping quality was found. The criterion of an indicator change by volatile fatty acids in the Swift stability test rather than the attainment of an arbitrary peroxide value gave a closer association of Swift stability values with organoleptic storage life of lard.

The aging of serum. Changes in the lipide-protein system during aseptic storage of serum. F. Tayeau and R. Rolland (Univ. Bordeaux, France). *Compt. rend. soc. biol. 143,* 394-5(1949). Fresh normal human serum can fix 10-50 mg./l. of bile salt. Delipidized serum can fix 100-400 mg./l. because of a change in the absorptive surface. (*Chem. Abs. 44,* 2580.)

Influence of cod-liver oil on the tocopherol content of the blood and the fat content of the milk of dairy cows. R. Ferrando, P. Chenavier, and M. Cormier (Univ. of Lyon, France). *Bull. soc. chim. biol. 31,* 810-16(1949). When dairy cows were given 50-75 g. of cod-liver oil (containing 2000 I. U. per g. of vitamin A) daily for several weeks, their blood tocopherols decreased to 110-200 gamma-% (normal is above 250) and the butter fat content of the milk showed a significant decrease. (*Chem. Abs. 44,* 2093.)

Fat oxidation in dried milk and its prevention. C. H. Lea and J. A. H. Smith. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 341-9(1949). Ethyl gallate in a concentration of 0.07% in the powder retarded the onset of tallowiness 2.5 to 3 times. Heat-treatment and ethyl gallate extended the life 8 times at the same temperature. Ascorbic acid in a concentration of 0.031% extended the life 0.6 times. (*Chem. Abs. 44,* 2662.)

The nutritive value of butter. B. C. P. Jansen and E. H. Groot. *XIIth Intern. Dairy Congr., Stockholm 1949,* 191-8. There is no growth-promoting effect when pure vaccenic acid is added to the diet of young rats. There are indications that polyethenoic acids (as impurities) are responsible. The growth-promoting action of the unsaponifiable part of butter is greater than calculated from the amount of known vitamins. (*Chem. Abs. 44,* 2094.)

The physiological economy in milk-fat production. Krizenecky and Opichal. *Sbornik Ceskoslov. Akad. Zemedelské 20,* 98-115(1948). The utilization of digestible protein and carbohydrates in the production of 1 kg. fat in milk was studied mathematically when either the percentage of fat or the milk yield was increased. A milk composition of 3.5% fat and 3.2% protein and a yield of 300 kg. were considered standard. When milk production increases, the fat percentage is decreased. When the fat percentage increases, the percentages of protein and carbohydrates decreases (in hyperbolic curves). By increasing the fat production through increasing milk production, the results are reversed. (*Chem. Abs. 44,* 1590.)

Compositional quality of milk. I. The relationship of the solids-non-fat and fat percentages. G. A. Richardson and A. H. Folger. *J. Dairy Sci. 33,* 135-46(1950). The relationship between fat and solids-non-fat in both normal and abnormal milks does not appear to be linear except within restricted limits of fat percentage. No consistent relationship exists for milk from mastitis-positive cows.

Modern methods in butter production. J. Keilling and A. Camus. *Ann. nutrition et aliment. 3,* 405-11(1949). Pasteurization entails enrichment of butter in iron and copper unless proper metals be used in the equipment; it also destroys the natural microflora involved in the fermentation and development of aroma. (*Chem. Abs. 44,* 2137.)

Heat capacity of milk fat and dry defatted milk. I. Mikhailov. *Molochnaya Prom. 10,* (1), 25-7 (1949). Heat capacity of milk fat above m.p. is given by $c = 0.368 + 0.0021t$, in kcal./g./°; below the m.p. and down to —25° it is $c = 0.67 + 0.18e^{0.1t}$. For defatted milk the values are given by $c = 0.236 + 0.0038t$. (*Chem. Abs. 44,* 2140.)

Protein nutrition. I. Nutritive value of soybean protein. Y. Sakurai and Y. Kato. *Nogaku* (Sci. of Agr.) *1,* 48-9 (1947). Heating with steam 2 hours at 115-120°C. evidently raised the nutritive value of soybean protein. (*Chem. Abs. 44,* 2611.)

Lipide fractions of human adrenal glands. E. Adams and M. Baxter. *Arch. Path. 48,* 13-26(1949). In 77 human autopsy specimens, the total lipide, cholesterol ester and fatty acid fractions of the adrenal fat were not elevated in hypertension or arteriosclerosis when compared to those found after accidental death. In infectious disease and other disorders they were markedly decreased. (*Chem. Abs. 44,* 1594.)

Fatty substances from the adipose tissues of Bufo melanostictus. T. Tsukamoto and T. Ohtaki. *J. Pharm Soc. Japan 69,* 221-3(1949). Adipose tissue collected from 1606 male and female toads caught in June in Formosa contained approximately 83% lipide which had 0.22% unsaponifiable matter, 1.49% free fat acid, and 98.29% triglycerides. Fat acid consisted of 41% solid acid (palmitic and stearic acid) and 59% liquid fat acid (C_{18} or more unsaturated acid). The unsaponifiable matter contained an orange-yellow pigment and colorless platelet crystals. (*Chem. Abs. 44,* 1614.)

Ethyl oleate Brit. Pharm. S. M. Macpherson. *Pharm. J. 163,* 196(1949). The characteristics of and tests for this compound, which is newly recognized in the British Pharmacopeia as an alternative vehicle to vegetable oils in the preparation of certain intramuscular injections, are discussed. (*Chem. Abs. 44,* 1649.)

Ethyl oleate Brit. Pharm. U. P. Basu and S. Bhattacharya. *Pharm. J. 163,* 196(1949). The characteristics of ethyl oleate are compared with arachis oil and it is recommended as a substitute for the oil, especially as a solvent for vitamin A. (*Chem. Abs. 44,* 1649.)

The influence of sesamin upon the carcinogenic effect of benzopyrene in sesame oil. K. B. DeOme, L. M. Julian, and L. A. Strait. *Rev. path. comparee et hyg. gen. 49,* 550-1 (1949). Sesamin, a minor constituent of sesame oil, enhances the carcinogenic effectiveness of benzopyrene dissolved in this oil, but does not affect the solvent-serum distribution of the benzopyrene. (*Chem. Abs. 44,* 1188.)

Bismuth oleate in syphilis treatment. P. Zierz. *Med. Monatsschr. 3,* 691-2(1949). Basic bismuth oleate is of moderately fast absorption and well tolerated as is concluded from its use in 240 cases. (*Chem. Abs. 44,* 1200.)

PATENTS

Peanut products. J. T. Owen (Merck and Co.). *U. S. 2,494,717.* Ascorbic acid, its salts or its esters, is mixed with salt for coating peanuts to increase the stability against rancidity.

Phosphatide composition and shortening and methods for making same. M. Markley (Cargill, Inc.). *U. S. 2,494,771.* An improved stable fluid composition comprising 2 to 70% phosphatides, 0.1 to 1.2% of an aliphatic organic acid selected from the group consisting of oleic acid and sorbic acid and the balance an edible vegetable oil, which composition remains homogeneous and relatively free flowing over a wide temperature range.

Butter package. *C. G. Bennett. U. S. 2,497,203.* A mold retarding agent such as sodium chloride, sodium propionate, or calcium propionate is incorporated into the laminated wrapper.

Antioxidant. L. A. Hall (The Griffith Laboratories, Inc.). *U. S. 2,500,543.* An acid ester selected from the group consisting of esters of ascorbic and gallic acid, which ester is soluble in propylene glycol.

• Waxes

E. H. McMullen, Abstractor

The angle of contact between water and wax. G. D. Yarnold and B. J. Mason. *Proc. Phys. Soc. (London) 62B,* 125-8(1949). The effects of the velocity of the liquid surface and of the time of immersion on the angle of contact between clean surfaces of water and wax were investigated by a dynamic method. Experiments with water and a paraffin-wax coated steel sphere are described. (*Chem. Abs. 44,* 901.)

Making large electrets. Victor H. Laughter. *Radio-Electronics 21* (No. 4), 80-82(Jan., 1950). An electret is made by pouring melted wax between two metal plates to which a high direct voltage is applied. The voltage remains on until the mixture solidifies. The wax disc has become permanently electrostatically charged. A method to produce large (7-inch) electrets is described. A discussion of suitable materials for making electrets is given as well as methods for testing them.

WOOL ALCOHOLS. I. CHANGES IN PROPERTIES AS A RESULT OF OXIDATION. G. S. Muirhead, K. H. Oberweger, D. E. Seymour, and D. Simmonite. *J. Pharm. Pharmacol. 1,* 762-73(1949). Oxidation of wool alcohols (total unsaponifiable fraction of lanolin) causes a rise in acid and saponification values and a decrease in acetyl value and cholesterol content. (*Chem. Abs. 44,* 1231.)

AUTOMOBILE POLISHES, CLEANERS, AND WAXES. A. E. Moore. (R. M. Hollingshead Corp.). *Chem. Ind. 66,* (3), 385, 386, 388, 390, 392, 452(1950). A review of the types of automobile polishes, cleaners, and waxes on the market today. Formulae are given for each type discussed.

WAX AND LUBE OILS SHINE AT CIT-CON. James A. Lee. *Chem. Eng. 57,* (3), 94-96, 170-173(1950). A process description, with flowsheet, of the Cit-Con Oil Corporation's new plant near Lake Charles, Louisiana, is given. Methyl ethyl ketone solvent dewaxing is used for all solvent-refined raffinate stocks to separate wax from oil. Final refining of crystalline wax to remove odor and taste, and to improve color, is done in the acid treatment plant followed by percolation through bauxite clay.

PATENTS

PREPARATION OF ARTIFICIAL WAXES AND GREASES. S. L. Scott (E. I. du Pont de Nemours). *U. S. 2,407,181.* Wax-like products, molecular weight 400-4000, melting point 85-110°, suitable for use in polishes, lubricating oil, and paper coating, are obtained by interaction of an alkene, e.g. ethylene, with SiX_4 (X is halogen, e.g. Cl) at 75-300°/600-1000 atmospheres in presence of 0.1-5% of a catalyst, e.g. diethyl peroxide, and optionally in a solvent (cyclohexane). (*Brit. Abs.* BII, Jan., 1950, 83.)

PURIFICATION OF VEGETABLE OILS AND WAXES, ANIMAL OILS, COMPOUNDED MINERAL OILS, AND USED OILS. R. P. Dunmire (Buckeye Laboratories Corp.) *U. S. 2,401,338.* Vegetable oils and waxes are purified by heating at the temperature of incipient distillation at 1-50 mm. in the presence of a solid adsorbent (bone char, fuller's earth, carbon-black, etc.) and after distillation of impurities of low boiling point, the purified oil is recovered by filtration (after cooling). Thus, coconut, soyabean, and palm oil are purified at, respectively, 65-150°, 120-240°, and 95-205°. (*Brit. Abs.* BII, Jan., 1950, 79.)

MODIFICATION OF NATURAL WAXES. L. Auer. *U. S. 2,406,336.* Natural ester type waxes, e.g. beeswax, carnauba, spermaceti, candelilla, Japan, Bayberry (myrtle) wax, etc., are modified by heating with various agents, to give products suitable for use in the production of polishes, dental, sealing, and ski waxes, and as impregnating agents for carbon paper and typewriter ribbon. Thus, beeswax, melting point 64°, acid value 20.2, saponification value 93.3, when heated with 5% of sodium bisulfite during five hours at 300° under carbon dioxide, affords a product, melting point 137°, acid value 1.95, saponification value 96.4. (*Brit. Abs.* BII, Jan., 1950, 83.)

THERMOPLASTIC COMPOSITION. Austenal Laboratories, Inc. *British 621,845.* A composition suitable for moulding into casting patterns (for making dentures etc.) contains 50-90% of wax (candelilla, carnauba, or beeswax) and 50-10% of a miscible blown vegetable oil (linseed oil). Natural or synthetic resins may be incorporated. (*Brit. Abs.* BII, Jan., 1950, 97.)

• Drying Oils

Robert E. Beal, Abstractor

THE COMPONENT GLYCERIDES OF DRYING OILS. I. LINOLEIC-RICH OILS. C. Barker and T. P. Hilditch. *J. Oil & Colour Chemists' Assoc. 33,* 6-23(1950). Low temperature crystallization was used to resolve the glycerides of a Niger seed oil, a safflower seed oil, and 6 sunflower seed oils into fractions of different iodine value. Each fraction was analyzed for fatty acid composition by spectrophotometric and iodometric methods and its glyceride structure calculated on the assumptions that no more than two different fatty acids are present in the same glyceride molecule, that saturated acids are not combined in the same molecule with diunsaturated acids, and other simplifying assumptions. A good linoleic drying oil must contain 90% glycerides with 2 or 3 linoleo groups in the molecule and since the oils examined conform closely to the "rule of even distribution" this means that they must contain not less than about 66% of linoleic acid. II. LINOLENIC-RICH OILS. *Ibid.* 24-48. The glycerides of samples of conophor oil, two linseed oils, two candlenut oils, rubber seed oil, hemp seed oil, and soybean oil were fractionally crystallized and examined. The "rule of even distribution" is found to apply quite well to these oils when their glyceride structure is calculated using certain simplifying assumptions. To be equivalent to a good linseed oil an oil should contain at least 60% glycerides having either 2 or 3 linolenic acids and at least 80% glycerides having either 2 or 3 polyethenoid (linoleic and linolenic) acids. Even distribution requires, therefore, that the fatty acid composition of the oil include at least 70% polyethenoid acids and at least 50% linolenic acid.

THE EXAMINATION OF LINSEED OIL WITH WOOD LIGHT, AND THE VALIDITY LIMITS OF THE COLOR REACTION OF THE OIL FROM PLATA (ARGENTINA). A. Foschini. *Chimica* (Milan) *4,* 265-9 (1949). The green color obtained in the alcohol extract of linseed oil treated with HCl is not given by oils of the 1st and 2nd pressing but is given by oils of the 3rd pressing or by solvent-extracted oils. It is possible to distinguish oils of the 1st, 2nd, and 3rd pressing by comparison of their fluorescences with standard samples. (*Chem. Abs. 43,* 9481.)

MODERN MANUFACTURE OF BODIED LINSEED OILS. L. Sussmeyer. *Chim. Peintures 12,* 240-5(1949).

CHANGE OF FUNCTIONALITY AND OF DIELECTRIC PROPERTIES IN THE COURSE OF THE GLYCEROLYSIS OF LINSEED OIL. Y. N. Vol'nov and V. I. Safronchik. *Zhur. Priklad. Khim. 21,* 744-50(1948). The product of the glycerolysis of linseed oil at 230-240° and the condensate of the glycerolyzate with phthalic anhydride were examined for acid, ester, iodine and hydroxyl numbers, molecular weight, refractive index, dielectric constant, molar refraction, and polarization. Determinations of polarizability which is calculated from the molar refraction and the polarization, are a suitable criterion of the progress of the glycerolysis and resinification reactions. (*Chem. Abs. 43,* 9481.)

DEHYDRATION OF CASTOR OIL. USE OF H_2SO_4 AT LOW PRESSURE. J. G. Kane and L. R. Kuloor. *J. Sci. Ind. Research* (India) *7B,* No. 11, 184-7(1948). Dehydration with H_2SO_4 (optimum 0.15-0.30% acid, 10 mm., 250°) gave a pale, good-drying product. A combination of the acid with normal sulfates is superior to the acid alone as a catalyst. (*Chem. Abs. 44,* 348.)

PREPARATION OF THICKENED OIL FOR PRINTING INK FROM PERILLA OIL. F. Chow and S. Li. *J. Chem. Eng. China 16,* 7-8 (1949). Blown perilla oil is a substitute for blown linseed oil in printing inks. (*Chem. Abs. 44,* 353.)

SEED OIL OF PERILLA FINTESCENS. S. Ueno, S. Matsuda, and T. Kimura. *J. Nippon Oil Technol. Soc. 2,* Nos. 2/3, 37-43 (1949). The seed contained 29% oil, d_4^{20} 0.9308, n_D^{20} 1.4820, acid, saponification, iodine, and acetyl numbers 5.3, 190, 198.5, and 8.4, and unsaponifiable 1.2%. Unsaturated acids consist mainly of oleic and α-linolenic. (*Chem. Abs. 43,* 8708.)

PHOTOELASTIC EXAMINATION OF FILMS OF OIL VARNISHES AND OF STANDOILS. R. J. R. Singer. *Congr. tech. intern. ind. peintures inds. assoc. 1,* 192-202(1947). Films of linseed standoil and of phenolic-tung-linseed varnishes were prepared by spraying on glue-coated paper, drying 3-8 days, removing the support by washing with cold water, conditioning, and cutting into strips. Behavior under stress, maximum elongation, breaking strength, and the specific birefringence resulting from strain were studied by suspending the films vertically between a fixed clamp and another which replaced the right pan of a beam scale, while weights were added to the left pan of the scale. The maximum % elongation of films of a standoil and four different varnishes were 36, 139.5, 138, 120, and 102, and after aging 24 hours at 180° for the stand oil film and 80° for the varnish films the values fell to 27, 119, 117, 110, and 102. Breaking strengths in g./sq. mm. were 40, 238, 140, 320, and 280, and after aging were 40, 160, 320, 420, and 240 for the same films. After being stretched for several days films showed a drop in specific birefringence and maximum elongation indicating relaxation and fatigue. (*Chem. Abs. 43,* 8701.)

POSSIBILITIES AND LIMITATIONS OF TALL OIL AS A RAW MATERIAL FOR PAINTS AND VARNISHES, J. D. von Mikusch. *Farbe u. Lack 56,* 91-3(1950).

THE USE OF TALL OIL IN VARNISH MANUFACTURE. M. Saracini. *Olii minerali, grassi e saponi, colori e vernici 24,* 94-6(1947). For use in varnish manufacture tall oil must be decolorized, deodorized, and fractionated. (*Chem. Abs. 43,* 9481.)

TALL OIL AS A RAW MATERIAL IN THE CHEMICAL INDUSTRY. W. Rumpel. *Mitt. Chem. Forsch. -Inst. Ind. österr. 3,* 47-9 (1949). The composition of tall oil depends largely on the manufacturing process of sulfite or sulfate pulp. The properties of crude and refined oils and methods of refining are discussed. (*Chem. Abs. 43,* 8676.)

PROPERTIES AND APPLICATION POSSIBILITIES OF STYRENATED OILS. G. Masereel. *Chim. Peintures 12,* 206-8(1949).

STYRENATED OILS. J. Rinse and C. Korf. *J. Oil & Colour Chemists' Assoc. 32,* 593-7(1949). The inability of polystyrene to react with either linseed oil or styrenated linseed oil indicates that the copolymerization of styrene and drying oils begins at the fatty acid chain. The double bond of the fatty acid does not enter the reaction as shown by calculations based on iodine values and it is proposed that the reaction initiates at an active methylene group after ionization occurs from the loss of a H proton from the group. Proton acceptors speed up the reaction. Factors which speed the reaction, such as using conjugated oils or catalysts, or increasing the reaction temperature also shorten the average chain length of the copolymer. A 45-55 mixture of styrene and linseed oil was copolymerized at two temperatures and the products fractionated by precipitation from alcohol-benzene. The average chain length calculated from saponification values of all the fractions was about two styrene molecules per fatty acid but fractions of the polymer produced at the lower temperature were more variable than those produced at the higher temperature. Terpenes and α-methyl styrene, when present, enter the reaction as chain terminators. The % unreacted styrene after heating 50-50 mixtures of styrene and isomerized linseed oil, bleached linseed oil, or oxidized linseed oil for 8 hours at 160° was 6, 13, and 21, respectively.

PATENTS

BODIED OILS. W. Lange and R. G. Folzenlogen (Proctor and Gamble Co.). *U. S. 2,480,485.* Light-colored bodied oils are prepared by preheating the oil to be bodied, above 250° for a short time in the absence of air, cooling, adding a catalyst (BF_3 diluted with an inert gas), and bodying at 100°. (*Chem. Abs. 43,* 9484.)

RESIN-GLYCERIDE COATING. S. S. Gutkin (Falk & Co.). *U. S. 2,497,449.* A natural acid resin, an unsaturated fatty acid glyceride, a polyhydric alcohol having more than two primary valences, and a basic saponifying agent are reacted together at a temperature between the lowest reaction temperature of the alcohol and its decomposition temperature to form a coating composition.

EMULSION POLYMERIZATION PROCESS AND PRODUCT. P. K. Frolich, B. M. Vanderbilt, and M. W. Swaney, Standard Oil Development Co.). *U. S. 2,500,983.* A 4-6 carbon conjugated diolefin is emulsion-polymerized up to 90% at 25-70° in the presence of 3-8% of a 6-16 carbon tertiary aliphatic mercaptan, and a water-soluble, highly unsaturated higher fatty acid soap emulsifier. The emulsion is broken with a brine solution containing sufficient acid to convert the soaps to acids and the oily layer is washed with water to produce an oily drying composition.

SYNTHETIC DRYING COMPOSITIONS. S. O. Greenlee and J. D. Zech (Devoe and Raynolds Co.). *U. S. 2,502,518.* Linear polymeric esters are formed from the reaction of unsaturated dimeric acids derived from drying oils, with dihydric diphenols or esters thereof, in which a hydroxy group is attached to each phenol group. The product forms drying films or is vulcanizable with rubber vulcanizing agents.

IMPROVED DRYING OILS OF GREATER UNSATURATION. Oel- & Chemie-Werk A.-G. *Swiss 258,013.* Vacuum steam distillation of drying oils produces selective splitting and distillation of the more saturated acids and leaves a more unsaturated oil containing no mono- or diesters. Distillation is stopped when the unsaturation of the residue becomes constant. (*Chem. Abs. 44,* 349.)

• Detergents

Lenore Petchaft, Abstractor

COTTON FABRICS: SONIC LAUNDERING. H. K. Schilling, I. Rudnick, C. H. Allen, P. B. Mack, and J. C. Sherrill. *J. Acoust. Soc. America 1949,* 21, 39. Standard soiled cotton swatches were placed in a pan of soap and water above a high-frequency siren. The swatches were processed only five times; there was little visible agitation of the samples, and no strength loss. The result of this 60-minute treatment compares favorably with the removal of dirt accomplished by three commercial laundries, each processing the swatches 50 times and taking 3,000 minutes.

SYNTHETIC DETERGENTS VS. SOAP FOR INDUSTRIAL PURPOSES. John W. McCutcheon and Foster Dee Snell. *Soap Sanit. Chem. 26,* No. 2, 44-6, 87, 147 (1950). Synthetics show stability in acid solutions, lime soap solubility, compatibility with electrolytes, adaptability of the various types—anionic, cationic, and non-ionic to many varied operations, and price stability. Soap exhibits less irritation and defatting of skin, better performance in such physical measurements of detergency as reduction of surface tension and interfacial tension, excellent dispersing power, displacement of oil from fabric, simplicity of manufacture, and low cost.

PROPERTIES AND PRODUCTION OF SHAMPOOS IN POWDER FORM. Karl Bergwin. *Seifen-Öle-Fette-Wachse 75,* 373-5(1949). Review on shampoos from soaps, fatty alcohol sulfates, and their mixtures. (*Chem. Abs. 44,* 1270.)

HOUSEHOLD CLEANERS. I. WATER-SOFTENING AGENTS AND DISHWASHING DETERGENTS. C. V. Cardew. *Soap, Perfumery & Cosmetics, 23,* 45-9, 60(1950). Review of various types of water softeners, carbonates and phosphates, and dishwashing detergents, with patents, formulas, and physical form.

EXTENDING SOAP. Josef Augustin. *Seifen-Öle-Fette-Wachse 75,* 408-9(1949). Discussion of the filling of soaps and inorganic and organic fillers. (Chem. Abs. *44,* 1270.)

PRODUCTION OF TOILET SOAPS ON A NEW BASIS. Theodor Hempel. *Seifen-Öle-Fette-Wachse 75,* 261-4(1949). A discussion of a plant using spray tower. (*Chem. Abs. 44,* 1269.)

CHARACTERISTICS OF DETERGENT SUSPENDED DRILLING FLUIDS. Todd M. Doscher. *Oil Gas J. 48,* No. 8, 75-80(1949). The effects of soaps and sulfonates added to bentonite drilling fluids were studied. Commercial detergents of alkyl phenoxy polyethylene oxide ethanol and fatty and rosin acids were used. It was found that 5 to 20% naphthenic crude oil added to replace some of the detergent lowered the fluid losses and viscosity. Concentration of 2 to 3% detergent is economically more feasible but the commercial advantage of the fluids described has yet to be proved. (*Chem. Abs. 44,* 1249.)

DETERMINATION OF FATTY ACIDS IN SOAPS. K. L. Weber. *Seifen-Öle-Fette-Wachse 75,* 197-9, 216-18(1949). A review. (Chem. Abs. *44,* 1269.)

DETERMINATION OF WATER IN GLYCOLS AND GLYCEROL. C. R. Jordan and V. O. Hatch (Paint and Chem. Lab., Aberdeen Proving Ground, Md.). *Anal. Chem. 22,* 177-9(1950). The water is removed from a sample by azeotropic distillation with n-butanol and determined volumetrically by salting the butanol out of the distillate with potassium carbonate.

SPOT FORMATION IN TOILET SOAPS. H. Heller. *Seifen-Öle-Fette-Wachse 75,* 504(1949). Light-colored spots can be caused by carbonates, dark-brown spots by iron. (*Chem. Abs. 44,* 1269.)

THE PHASE BEHAVIOR OF LITHIUM STEARATE IN CETANE AND IN DECALIN. Marjorie J. Vold and Robert D. Vold. *J. Colloid Sci. 5,* 1-19(1950). Phase diagrams for the two systems, lithium stearate-cetane and lithium stearate-decalin, have been established by means of differential thermal analysis and visual observations. In both systems, five single phases are possible (two crystal forms of lithium stearate, one waxy phase, isotropic liquid, and nonaqueous middle soap), together with associated two- and three-phase equilibria. The similarities and differences between cetane and decalin as a solvent for lithium stearate are explained in terms of existing theories of the structure of the various phases. Some of the phenomena associated with the manufacture of lithium greases can be interpreted in terms of their phase behavior, which appears to resemble that of lithium stearate in cetane.

THE EFFECT OF ADDED ELECTROLYTES UPON THE X-RAY LONG SPACING OF SOME COLLOIDAL ELECTROLYTES. O. A. Hoffman Stanford Univ., Calif.). *J. Phys. & Colloid Chem. 54,* 421-5 (1950). The x-ray long spacings d_1, of moderately concentrated solutions of potassium laurate and cetylpyridinium chloride are first diminished by the addition of electrolytes, but excess of chloride brings about a strong change in the opposite direction. Existing theory does not account for these two effects in opposite directions.

POLYAMIDE ANTIFOAMS. II. STUDIES OF MONOMOLECULAR FILMS. A. J. Jacoby and C. E. Johnson (National Aluminate Corp.). *J. Phys. and Colloid Chem. 53,* 1417-26(1949). The behavior of the monolayers of three polyamide (dioctadecenoyldiethylenetriamine, dioctadecanoyldiethylenetriamine, and dihexadecanoylpiperazine) antifoams has been studied. These materials have assumed great importance in the prevention of foaming of boiler water.

SOLUBILIZATION IN SWOLLEN MICELLES. H. B. Klevens (Univ. of Minnesota, St. Paul). *J. Chem. Phys. 17,* 1004(1949). Soap micelles increase in size in the presence of hydrocarbons, but long-chain alcohols do not do this. Apparently the hydrocarbons are solubilized by being incorporated in the micelle center, whereas the polar molecules upon solubilization are oriented, as are the soap molecules with their hydrocarbon chain parallel to those of the soap molecules and the polar H-bonding head toward the water. If this hypothesis is correct, it should be possible to prepare a swollen micelle (soap solution essentially saturated with polar compound such as a long-chain alcohol) that would solubilize more hydrocarbon than the same concentration of soap alone. A system of soap, n-heptanol, and n-heptane, among others, behaved in accord with the hypothesis. (*Chem. Abs. 44,* 2331.)

RAPID INDUSTRIAL ANALYSIS OF SOAPS AND COMMERCIAL SOAP-LIKE PRODUCTS. Andre Paristo. *Olearia 3,* 13-20(1949). The method is based on the solubility of soaps and sulfonated products in aqueous-alcoholic potassium chloride solution, and the solubility of the other constituents in petroleum ether. The procedure is applied to saponaceous creams, beauty creams, dentrifrice soaps, liquid soaps, shampoo liquids, etc. (*Chem. Abs. 44,* 2263.)

MANUFACTURE OF TRANSPARENT SOAPS. M. A. Saboor and M. R. Dutta (Industrial Research Lab., Pagladanga, Calcutta). *Indian Soap J. 15,* 83-7(1949). Unsaturated fat acids produce transparent soaps more readily with sodium hydroxide alone than the saturated acids with the same number of carbon atoms. Vegetable oils with an appreciable quantity of saturated acids higher than stearic will interfere with the production of transparency with sodium hydroxide alone. The proportion of rosin and castor oil should be kept within limits to guard against stickiness and sweating. The use of large amounts of sugar for producing transparency should be avoided to prevent sweating and white incrustations on the soap. (*Chem. Abs. 44,* 2772.)

FLOATING SOAPS. Milton A. Lesser. *Soap Sanit. Chem. 26,* No. 3, 41-4, 143(1950). Review article covering methods of producing floating soaps such as inclusion of air or other gases by physical means, production of gas by chemical reaction, inclusion of light weight materials, or introduction of floating aids such as hollow bodies. Problems involved in preventing oxidation, perfuming, retaining whiteness, and continuous production are reviewed. 23 references including patents.

CHELATING AGENT IN SOAPS. John J. Singer and Frederick C. Bersworth (Bersworth Chemical Co., Framingham, Mass.). *Soap Sanit. Chem. 26,* No. 3, 45-7, 73(1950). Review article on use of chelating agents such as Versene (salts of ethylene diamine tetraacetic acid) in soaps, the chemistry of these compounds that inactivate metallic ions, methods of incorporating Versene in solid and liquid soaps, uses in dishwashing and laundry operations, and methods of analysis and testing for these agents.

DETERMINATION OF SAFROLE IN SOAP. Norman H. Ishler, Emanuel Borker, and Catherine R. Gerber. *Anal. Chem. 22,* 458-60(1950). An analytical method based on the ultraviolet absorption characteristics of safrole in 9.5% aqueous alcohol has been developed for the determination of safrole in soap. The safrole is steam-distilled from the sample after treatment with silver nitrate to precipitate the soap. The distillate is examined in a Beckman DU spectrophotometer and the concentration of safrole is determined from the observed absorption. This method is also applicable to analysis of detergents and water-softening compounds.

EFFECTIVENESS OF DETERGENTS IN REMOVING SOIL FROM A COTTON AND A WOOL FABRIC. Margaret S. Furry and Verda I. McLendon. (U. S. Dept. of Agriculture, Washington, D. C.). *Am. Dyestuff Reptr. 39,* 209-12(1950). In this study to determine the effect of standard soiled cloth on laboratory evaluation of detergents a printed soil cotton cloth and a printed soil wool cloth were used as test fabrics for evaluating the effectiveness of 10 soaps and 27 synthetic detergents (including alkyl sulfates, sulfonates, quaternaries and polyethylene ether condensates) in removing soil under standardized conditions. The change in light-reflectance was used as a measure of the soil-removing efficiency. Samples of the test fabrics were washed in the Launder-Ometer at 40°C. in distilled water at 4 different concentrations. In general, the synthetic detergents in all concentrations studied removed less soil from the cotton test cloth than did the soaps. However, results were different with wool. For example, the alkyl aryl sulfonates were much more effective in removing soil from wool than from cotton, while the unbuilt non-ionic detergents were the least effective with wool, but were fairly effective with cotton. The built non-ionics were among the most efficient of the detergents tested with wool.

THE SCOURING OF WOOL WITH SYNTHETIC DETERGENTS. J. A. Hepworth. *J. Soc. Dyers & Colourists 66,* 101-8(1950). Review of wool scouring operations with such synthetics as secondary alkyl sulphates, alkarylsulphonates, and alkylphenol-ethylene oxide condensates. The essential factors of the process outlined include: correct concentration of electrolyte in the scouring bowls, presence of free soda ash content in the main scouring bowls, correct distribution of detergent in the bowls, and correct temperature.

SURFACE-ACTIVE AGENTS IN DYEING AND FINISHING. Paul I. Smith. *Leather and Shoes 118,* No. 25, 24(1949). Practical suggestions. (*Chem. Abs. 44,* 2758.)

PATENTS

MANUFACTURE OF SOAP FROM SPERM OIL. G. Schmidt and C. Edwards. *U. S. 2,492,940.* This apparatus and method for continuously saponifying sperm oil is so designed to take advantage of the exothermic heat for continuing saponification of new charges.

SPRAY RESIDUE REMOVAL COMPOSITION. R. H. Larsen and F. Bresee. *U. S. 2,493,460.* A concentrated liquid composition adapted to be introduced into water to form a washing solution capable of removing spray residues from agricultural products comprises a hydrocarbon oil capable of acting as a solvent upon the fruit wax, an alkyl aryl sulfonate wetting agent and an alkaline agent combined with the fatty acid to form a soap.

PRODUCTION OF GLYCERIN AND DISTILLED FATTY ACIDS. V. Mills (Procter & Gamble Co.). *U. S. 2,495,071.* A counter current hydrolysis plant is so designed that the water and the fatty acids produced are immediately subject to distillation, thus taking advantage of the heat in the liberated fatty acids.

PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF SOAP IN EXTRUDED FORM DIRECTLY FROM THE RAW MATERIAL. Ludovit Konstandt. *British 633,138.* Process for continuously producing soap in extruded form directly from its raw materials with simultaneous extraction of the glycerin, by separately heating the raw materials to a certain temperature below saponification temperature, saponifying under pressure, extracting glycerin, cooling, mixing, homogenizing, and pressing, each step being done at successively lower temperatures.

AQUEOUS SOLUTIONS OF ALKYL ARYL SULFONATES. James E. Cornell and John E. Hanson (California Research Corporation). *U. S. 2,500,024.* Preparation of concentrated aqueous solutions of alkyl aryl sulfonates containing sodium sulfate and organic builders, such as a water-soluble polyether alkylene, which act as a solubilizer for the sulfonate.

ANHYDROUS SOAP MANUFACTURE. Martin Hill Ittner (Colgate-Palmolive-Peet Co.). *U. S. 2,501,467.* Production of soap having controlled moisture content, treated to exclude air by processing in presence of water and providing apparatus to expel soap and vaporize desired amount of water.

APPARATUS FOR COOLING SPRAY-DRIED SOAP. Robert George Whitman (Colgate-Palmolive-Peet Co.). *U. S. 2,501,487.* Cooling and aeration of hot spray-dried soap particles is effected on a stationary, perforated, sloping detention bed down which the particles travel towards the packaging apparatus.