ABSTRACTS.... R. A. REINERS, Editor

ABSTRACTORS: Lenore Petschaft Africk, R. R. Allen, S. S. Chang,
Sini'tiro Kawamura, F. A. Kummerow, and Dorothy M. Rathmann

• Fats and Oils

Determination of the Peroxide Value of Edible Fats by Colorimetric Iodometric Procedures. P. A. T. Swoboda and C. H. Lea (Low Temp. Sta. for Research in Biochem. and Biophysics, Univ. of Cambridge). *Chem. and Ind.* **1958**, 1090–1. A procedure for determination of peroxide values was reported which is useful when the quantity of fat available or its peroxide value is too small for convenient titration with thiosulphate. Colorimetric assay of the iodine liberated by the peroxide is performed in an acidic aqueous phase, without excluding atmospheric oxygen, by converting excess iodide into a more stable cadmium-iodide complex ion. The liberated iodine is measured either (a) directly by means of the absorption band of the triiodide ion in the ultraviolet or (b) by means of the blue color of the starch-iodine complex.

Reactions of Conjugated Fatty Acids. VII. Catalytic Cyclization and Aromatization of Cis,Trans-Octadecadienoic Acid with Selenium. H. M. Teeter, E. W. Bell, and M. J. Danzig (Northern Utilization Research and Development Div., Agr. Research Service, U.S.D.A., Peoria, Ill.). *J. Org. Chem.* **23**, 1156–8 (1958). When *cis,trans*-conjugated methyl linoleate was heated at 250° with selenium, the product consisted of a mixture of isomeric *cis-* and *trans*-octadecenoates and cyclized material that appeared to be a mixture of dialkylbenzene and dialkylcyclohexene and could be converted to *o*-phthalic acid in 54% yield. In the presence of hydrogen acceptors, the ratio of octadecenoate to cyclic product was decreased. Results of a kinetic study suggest that the first step in the reaction is rapid isomerization of *cis-trans*-conjugated methyl linoleate to the *trans,trans*-isomer and that it is the latter that cyclizes.

Coloring Fat-Base Foods with β-Carotene. J. C. Bauernfeind, E. G. Smith, and R. H. Bunnell (Hoffmann-La Roche Inc., Nutley, N. J.). *Food Tech.* **12**, 527–35 (1958). Several forms of micropulverized *trans* β-carotene, ranging in potency from 1–30%, have been described for the coloring of fat-base foods. The fine crystalline forms of these β-carotene formulations permit rapid solution of added carotene in the fat phase, at the desired carotene concentration for the specific food product, at a temperature of 100–130°F. Method of preparation, physical properties and the stability characteristics of marketable forms of micropulverized β-carotene are described. Application studies with these forms of β-carotene are presented for the coloring of margarine, butter, shortening and lard, dried egg yolk and process cheese. Suggestions are given for coloring other fat-base foods, such as toppings, popcorn oil, salad oil and dressings, etc.

Branched-Chain Fatty Acids. XXXVI. Synthesis of Three Methyltetracosanoic Acids. J. Cason and D. J. McLeod (Chemical Labs. of Univ. of California, Berkeley, Calif.). *J. Org. Chem.* **23**, 1497–1500 (1958). In view of the physiological response to 10-methyltetracosanoic acid, which resembles that of C_{27}-phthienoic acid from tubercle bacillus, there have been synthesized three methyltetracosanoic acids with branches near the 10-position: 8-, 9-, and 11-methyltetracosanoic acids. The syntheses were accomplished *via* the hydroxy ester resulting from reaction of an n-alkylmagnesium bromide with an appropriate *sec*-butyl keto ester.

Infrared Studies on Some Features of Methylene-Interrupted Double Bonds in Autoxidation of Fatty Acid Esters. Nural Absar Khan (Pakistan Council Sci. and Ind. Research, Tejgaon, Dacca). *Pakistan J. Sci. Ind. Research* **1**, 12–16 (1958). Methyl linoleate and methyl linolenate were autoxidized at 3 temperatures with or without stirring and countercurrently extracted in 12 funnels using petroleum ether and alcohol, both saturated with water. Methyl linoleate, autoxidized at 0° without stirring, gave no polymeric material, and a *cis,trans*-conjugated monohydroperoxide. Methyl linolenate at −10° gave a *cis,trans*-conjugated monohydroperoxide. Methyl linoleate at 0° with stirring gave a peroxide fraction and no polymer. Methyl linolenate at 0° without stirring gave peroxide and no polymer. Methyl linoleate at 24–26° without stirring gave a peroxide and 16% polymer. Methyl linolenate at 24–26° gave peroxide and 31% polymer. The infrared spectra (LiF) in the region 3.3–3.5 microns of methyl linoelaidate, conjugated methyl linoleate, conjugated methyl linoleate hydroperoxides, and methyl *cis,cis*-linoleate are given. The peroxide fraction from sodium linoleate autoxidized in the presence of lipoxidase (*C.A.* **47**, 8797b) kept at −50° in alcohol gave 4.6% polymeric precipitate. The peroxide was identical except in optical rotation with that obtained from ordinary autoxidation. (*C. A.* **52**, 17096)

The Analysis of Monoglycerides and Glycerol. E. Becker and L. Krull. *Fette, Seifen, Anstrichmittel* **60**, 449–52 (1958). Comparative determination of α-monoglycerides and glycerol and calculation of errors in the methods by Pohle and Mehlenbacher (cf. *C.A.* **44**, 3272a) and Kruty (cf. *C.A.* **49**, 1346i) gave absolute errors of ±0.9 and ±0.3%, respectively. The equilibrium of α- and β-glycerides is entirely in favor of the α-form, hence determination of β-glycerides based on the isomerization by means of perchloric acid is not applicable to commercial samples. (*C.A.* **52**, 17757)

Interesterification of Fats. K. Täufel, Cl. Franzke, and M. Achtzehn (Univ. Berlin). *Fette, Seifen, Anstrichmittel* **60**, 456–61 (1958). Data on the interesterification of vegetable oils, lard, tallow, hydrogenated oils, and of mixed fats in xylene at 10–40° and at 65°, with various catalysts (principally sodium methylate) are recorded and discussed. (*C.A.* **52**, 17757)

The Interesterification of Lower Fatty Acids into Natural Fats and Oils. K. Täufel, M. Achtzehn, and Cl. Franzke (Humboldt-Univ., Berlin, Ger.). *Nahrung* **2**, 178–92 (1958). The introduction of low-molecular fatty acids into natural fats and oils was studied. Best results were obtained with ester-ester interesterification in xylol with sodium methylate catalyst at low temperatures (70°). Reaction of the lower free fatty acids with the natural glycerides required higher temperatures and longer reaction periods, and the yields are lower. The interesterified products are more stable and take up water better than the original oils. Use of these in margarine is discussed. (*C.A.* **52**, 17757)

Glycolipides. On the Sphingolipides. Yasuhiko Fujino (Zootech. Univ., Obihiro, Hokkaido). *Kagaku no Ryôiki* **11**, 214–19, 297–302 (1957). A review with 71 references. (*C.A.* **52**, 17337)

Extraction of Fatty Acids from Hydrolyzates with the aid of Ion Exchange. A. Nowotny (Ungarischer Blutspendedienst, Budapest, Hung.). *Naturwissenschaften* **43**, 519 (1956). Fatty acids can be readily isolated from extracts containing dissolved proteins. The alkaline saponified mixture is neutralized, placed on an Amberlite IRA 400 (hydroxyl form) column, and washed with distilled water. Only the fatty acids are retained. Pure, crystalline fatty acids are obtained by eluting the column with methyl alcohol and concentrating the eluate *in vacuo*. (*C.A.* **52**, 17358)

Storage and Transportation of Crude and Refined Oils. E. Olin (AB Karlshamns Oljefabriker, Karlshamn, Swed.). *Nord Symposium om Harskning af fedtstoffer*, 2, Symposium, Helsinki, 203–11 (1957) (in Swedish). A review (*C.A.* **52**, 17758)

Hydrogenation of Extracted Sunflower Oil in a Hydrogenation Installation with Oil Circulation of the Vilbushevich Type, in a Hydrogen Atmosphere. D. Freier and Fl. Constantinescu. *Lucrările inst. cercetări aliment.* **2**, 91–7 (1958). Crude gasoline-extracted sunflower oil could not be hydrogenated in the Vilbushevich apparatus. To condition for hydrogenation, refine to a light color and hydrogenate in presence of activated carbon. (*C.A.* **52**, 17758)

Effect of Damage to Rutabaga Seed on the Fatty-Acid Content of the Oil. P. K. Järvi (Oy Kasviöljy, Raisio, Finland). *Nord Symposium om Harskning af Fedtstoffer* 2, Symposium, Helsinki, 157–61 (1957) (in Swedish). The fatty-acid content of whole rutabaga (*Brassica campestris* var. *Oleifera*) seeds stored at room temperature and relative humidities 7–20% changes only slightly during 25 days' storage. At 37° and 20% humidity there is an increase after 5 days. Broken seeds show a sharp rise in fatty-acid content in the oil after 5 days, except at room temperature with 7% humidity. Sprouting of the seeds had little effect on fatty-acid content. The increase in fatty-acid content is considered to be due to bacterial action. (*C.A.* **52**, 17758)

SYNTHETIC OLIVE OIL. M. Staub and Rose Widmer (Kantonales Lab., Zurich, Switz.). *Mitt. Gebiete Lebensm. u. Hyg.* **49**, 61–5 (1958). Physical and chemical properties of virgin olive oil prepared by catalytic esterification of olive oil fatty acids are compared. The synthetic oil contains oleic acid isomers which become evident through a difference in the peroxide number after irradiation. (*C.A.* **52**, 17758)

THE MICROCHEMICAL DETERMINATION OF NICKEL IN HYDROGENATED FATS. V. M. Znamenskaya and Yu. G. Titova. *Trudy Krasnodar. Inst. Pishchevoĭ Prom.* **1955**, No. 11, 47–9; Referat Zhur., Khim. 1957, Abstr. No. 10153. A micromethod for the determination of nickel in hydrogenated fats and margarine is described. (*C.A.* **52**, 17757)

CHEMICAL COMPOSITION OF THE OILS FROM MAIZE GERM FROM BUENOS AIRES PROVINCE. J. A. Burquete. *Rev. fac. cienc. quim. Univ. nacl. La Plata* **29**, 61–9 (1955–56). The effect of climate and ecological zone on 22 strains of corn grown in the province of Buenos Aires are studied. Greatest variability among analytical data appeared in per cent oil and acid number. The unsaturated acids comprise oleic 25.6–45.5 and linoleic 35.1–53.4% with minor amounts of palmitoleic (0.5–2.0%); the saturated acids comprised palmitic 9.5–18.7% with a minor amount of stearic (0.1–3.2%) and higher than C_{18} (0.9–1.5%) expressed as arachidic. The oil from samples grown at the highest (coldest) latitude had high contents of linoleic acid and saturated acids, and low contents of oleic acid. (*C.A.* **52**, 14198)

OIL SEPARATED FROM FRUIT OF RHUS TRICHOCARPA. H. Takai and Y. Toyama (Nagoya Ind. Sci. Research Inst.). *Nagoya Sangyô Kagaku Kenkyûjo Kenkyû Hôkoku* **10**, 62–3 (1957). The fruit of *Rhus trichocarpa* was Soxhlet extracted with ether. Fifty volumes *n-hexane* were added to the 22.5 g. of oil obtained and the mixture filtered to yield 21.2 g. of oil. The oil was a dark-green solid which melted at 50°. This residue was powdered and extracted with a large amount of ether. To the 19.2 g. of oil obtained 20 volumes of *n*-hexane were added and the mixture filtered to obtain 17.6 g. of a dark green liquid. The properties of the oil and the dark-green liquid, respectively, are: d^{98} 0.8933, d^{50} 0.918; n^{40}–, 1.4665; acid value 12.9, 8.8; saponification number 203.7, 192.8; iodine number 13.6, 116.7; unsaponifiable 0.44, 1.89%; neutralization value of fatty acid 210.3, 202.3; iodine number 13.9, 121.3; linoleic acid 0.4, 57.9; oleic acid 14.6, 18.9; saturated acid 85.0, 23.2%. (*C.A.* **52**, 15096)

TRANSESTERIFICATION OF LINSEED OIL WITH DIHYDRIC ALCOHOLS. O. Mlejnek, J. Artbauer, L. Chaternuch, and J. Zvach. *Chem. průmysl* **7**, 41–4 (1957). A mixture of 1:2.35 ethylene glycol and diethylene glycol was transesterified with alkali-refined linseed oil. A complete analysis of the end products was impossible. (*C.A.* **52**, 14532)

THE SPECIFIC DISTRIBUTION OF FATTY ACIDS IN THE GLYCERIDES OF ANIMAL AND VEGETABLE FATS. F. H. Mattson and E. S. Lutton (The Procter and Gamble Co., Miami Valley Labs., Cincinnati, O.). *J. Biol. Chem.* **233**, 868–71 (1958). By means of pancreatic lipase, which specifically removes the fatty acids esterified with the primary hydroxyl groups of glycerol, the location of the fatty acids in the glycerides of a number of naturally occurring vegetable and animal fats has been studied. It is concluded that: (1) Naturally occurring triglycerides exhibit a high degree of specificity of fatty acid distribution, so that random distribution does not occur in either vegetable or animal fats. (2) In the vegetable fats the saturated fatty acids are predominantly esterified with the primary hydroxyl groups of glycerol. (3) No general pattern of distribution prevails among the animal fats, although non-random distribution is evident. This is particularly apparent with respect to oleic-linoleic acid distribution. (4) Lard is unique in that of all the fats studied, it is the only one in which the saturated fatty acids are predominantly in the 2 position.

DETECTION OF OILS OBTAINED BY CATALYTIC ESTERIFICATION OF OLIVE-OIL FATTY ACIDS (ESTER OILS) IN OLIVE OILS. A. Massarotti (Kantonales Lab., Lugano, Switz.). *Mitt. Gebiete Lebensm. u. Hyg.* **49**, 15–29 (1958). The differences between so-called ester oils and virgin olive oil are discussed in detail. Oils with hydroxyl numbers greater than 10 and with 1-monoglyceride content over 1% are suspected to contain ester oils. The Bellier test for peanut oil is negative with virgin olive oil when tested with 70 or 90% ethyl alcohol. Other criteria for the presence of ester oils are presence of more than 0.1% oxidized fatty acids, aniline values below 17, and presence of traces of catalysts (tin, aluminum, and zinc). (*C.A.* **52**, 17758)

STUDIES ON THE SEED FATS OF CUCURBITACEAE RICH IN CONJUGATED ACIDS. THE COMPONENT FATTY ACIDS OF MOMORDICA DIOICA AND TRICHOSANTHES CUCUMERINA. M. M. Chakrabarty, S. Bhattacharyya, M. J. Desai, and S. A. Patel (Univ. Coll. Technol., Calcutta). *Naturwissenschaften* **43**, 523-4 (1956) (in English). *Momordica dioica* contains 33.5% oil in kernel and *Trichosanthes cucumerina* contains 28% of oil in seed. Characteristics of the oils, respectively, are: n^{40} 1.4945, 1.4881; saponification equivalent 296.0, 300.8; percentage of unsaponifiable matter 0.9, 1.2; iodine number 114.0, 134.7 (not true values owing to the presence of conjugated acids); free fatty acid (as oleic) 1.4, 17.0%. Compositions of the fatty acids, respectively, are: saturated acids 27.1, 11.87; oleic 9.2, 32.84; linoleic 8.8, 19.83; α-eleostearic (probably present as trichosanic) 54.9, 34.46%. (*C.A.* **52**, 17758)

SEPARATION OF MIXTURES OF HYDROCARBONS BY ADSORPTIVE AND PREPARATIVE METHODS AND THEIR APPLICATION ON WAXES. IV. I. G. Spengler and G. Hauf. *Fette, Seifen, Anstrichmittel* **59**, 509–14 (1957). A detailed procedure for the separation of higher-molecular-weight waxes into their components is outlined. The acids, esters, alcohols, and lactones are adsorbed on a silica-gel column and are analyzed as eluted from this. (*C.A.* **52**, 17759)

THE INDUSTRIAL EXPLORATION OF AMAZONIAN OIL SEEDS. R. F. A. Altman (Inst. nacl. pesquisas amazonia, Manaus, Brazil). *Inst. nacl. pesquisas Amazonia Publ.* No. 4, 3–24 (1958). The abundance, availability, and economical exploitation of oil seeds indigenous to the Amazonian region are discussed. There is special emphasis on the burity palm *(Mauritia vinifera)* as a source of oil containing 300 mg. carotene per 100 g. of oil. (*C.A.* **52**, 17758)

OXIDATION BEHAVIOR DURING OIL EXTRACTION. P. Møller (AB Karlshamns Oljefabriker, Karlshamn, Swed.). *Nord. Symposium om Harskning af Fedtstoffer*, 2, Symposium, Helsinki, 195–202a (1957) (in Swedish). The method described by Wode is applicable to determination of quality of crude oils, but is not suitable for estimation of the stability of the finished product. (*C.A.* **52**, 17757)

DETERMINATION OF OXIDATION DURING EXTRACTION AND REFINING OF OILS AND FATS. G. Wode (Margarinbolaget AB, Bromma, Swed.). *Nord. Symposium om Harskning af Fedstoffer*, 2, Symposium, Helsinki, 181–93 (1957) (in Swedish). Carbonyl compounds in oxidized or reverted oils are determined by the color developed by reacting the carbonyl compounds with benzidine. (*C.A.* **52**, 17757)

PEROXIDE-NUMBER METHODS. J. Glavind (Afd. f. Biokemi & Ernaering, Copenhagen). *Nord. Symposium om Harskning af Fedtstoffer*, 2, Symposium, Helsinki, 139–48 (1957) (in Danish). A review with 17 references. (*C. A.* **52**, 17757)

HOT LIQUEFACTION OF FATS. A. P. Shorin (Hydrogenation Factory, Moscow). *Masloboĭno-Zhirovaya Prom.* **24**(3), 32–7 (1958). Apparatus for the liquefaction of fat in railroad tank car is discussed in some detail. (*C.A.* **52**, 17755)

CONTRIBUTIONS TO THE STUDY OF MARINE PRODUCTS. XLVI. PHOSPHOLIPIDS OF A SEA ANEMONE. W. Bergmann and R. A. Landowne (Sterling Chem. Lab., and the Bingham Oceanographic Lab., Yale Univ., New Haven, Connecticut). *J. Organic Chem.* **23**, 1241–45 (1958). The phospholipids of the sea anemone, *Anthopleura elegantissima,* have been isolated and analyzed. The principal, if not the only, representatives were sphingomyelin and plasmalogen in a ratio of twenty to one. The sphingomyelin consisted mainly of the N-palmityl type. The plasmalogen fraction was obtained in a high state of uniformity. Its rather small degree of unsaturation, its infrared spectrum, and the presence of only one chain of methylene groups showed the acetal attachment of the aldehyde moiety in agreement with Feulgen's original formulation.

A GAS-LIQUID CHROMATOGRAPHIC METHOD FOR VOLATILE FATTY ACIDS IN MILK. C. L. Hankinson, W. J. Harper, and E. Mikolajcik (Ohio Agricultural Experiment Station, Wooster, and The Ohio State Univ., Columbus, Ohio). *J. Dairy Sci.* **41**, 1502–9 (1958). Gas-liquid partition chromatography provided a means for a rapid and accurate analysis for the volatile fatty acids in milk. The chromatographic apparatus utilized a 6 mm. I.D. glass column 4 ft. long and packed with Celite 545 containing 25% liquid phase. The liquid phase consisted of silicone-stearic acid (95/5 w/w) mixture. The operating temperature of the column was controlled by use of a heating jacket through which glycerol could be circulated. Analysis for formic, acetic, propionic, butyric, valeric, caproic, and caprylic acids could be completed in 90 min. This was achieved using a constant nitrogen gas pressure of 100 cm. of mercury and progressively increasing the column temperature from 60–160°. Quantitative recovery of a mixture of the seven pure acids was obtained in all trials.

Bleaching of Fats and Oils. Société des produits chimiques de l'Ariège. *Fr. 1,033,284.* Animal or vegetable fats or oils are bleached by heating with 5% sodium chlorate (dissolved 1:1 in water) and stirring with 1–2% hydrochloric acid, phosphoric acid, oxalic acid, or metaphosphate (when the coloration is faint) at 80–5° for 30 minutes. The bleached fat or oil is ready for soapmaking without further treatment. (*C.A.* 52, 17761)

Autoxidation Inhibitors. W. Stein, L. Mannes, and H. Hartmann (Henkel & Cie. G. m. b. H.). *Ger. 936,646.* The unsaponifiable residue of natural fats contains autoxidation inhibitors which are purified and used for the preservation of fats, terpenes, etc., or as retardants in drying oils. From 0.01 to 0.5% or more of synergistic substances, e.g., mono-, di-, or polycarboxylic acids or phosphoric acid, are added. (*C.A.* 52, 17761)

Long-Chain Unsaturated Ketones and the Corresponding Oxodicarboxylic Acid. B. Menon, U. G. Nayak, R. K. Razdan, K. K. Chakravarti, and S. C. Bhattacharyya (Council of Scientific and Industrial Research). *Indian 55,757.* Undec-9-ynoic acid is converted into acid chloride by thionylchloride. The acid chloride is treated with trimethylamine to form ketene dimers which when refluxed with alcoholic potash and diluted with water gave $[CH_3C{\equiv}C(CH_2)_7]_2CO$, melting at 61° (alcohol). The above ketone oxidized with an oxidizing agent such as ozone, potassium permanganate, or chromic acid gives 8-oxopentadecane-1,15-dicarboxylic acid, melting at 114°. (*C.A.* 52, 13785)

Continuous Separation of Water in Esterification of Glycerol. E. Santelli and P. Berlingozzi. *Ital. 521,495.* A description and diagrams are given for an apparatus which permits continuous dehydration of the glycerol sweet waters produced in the synthesis of fatty-acid glycerides. (*C.A.* 52, 17762)

Extraction of Oils and Fats from Exhausted Bleaching Earths. Fratelli Gianazza Società in accomandita semplice. *Ital. 532,224.* The earth is treated several times with a solvent in a rotary drum. The solvent is completely recovered by treating the drum and earth with steam. (*C.A.* 52, 17762)

Powered Wax or Paraffin. Kazuo Sato (Matsushita Electric Industry Co.). *Japan. 9469('56).* Wax (100 g.) is melted at 70–80°, mixed with 50 g. solvent naphtha containing 1–10 g. polyoxyethylene sorbitan monostearate at the same temperature, and 10–50 g. warm (70–80°) water added gradually and stirred. The resulting emulsion is sprayed and dried to give powdered wax. Other surface active agents instead of polyoxyethylene sorbitan monostearate are also applicable. (*C.A.* 52, 17762)

Waxes for Treatment of Leather and Floors. H. Schneider (H. Schneider & Co.). *Swiss 323,323.* Polysiloxanes in the silicone oils are added to wax compositions to enhance their water resistance and improve luster. Examples of wax compositions for leather and floor coverings, respectively, are: wax, 22, 22; terpene oil, 64, 38; dye, 1, 0; water, 10, 38; silicone oils, 2, 1; preservative, 0.2, 0.2; and perfume, 0.8, 0.8%. (*C.A.* 52, 17762)

Wool Grease. L. F. Evans and W. E. Ewers (Commonwealth Scientific and Industrial Research Organization). *Ger. 932,512.* Wool grease is obtained by centrifugation from the foams of wool wash waters after dispersion by means of potassium pyrophosphate and sodium pyrophosphate or potassium or sodium polyphosphates. Sodium carbonate, sulfuric acid, phosphoric acid, or sodium biphosphate can be added to fix the pH necessary, on which depends the acid number of the grease obtained. Grease with an acid number 0.5 needs a pH 10.2; with an acid number 1, a pH 9.8 is needed. Acid numbers of 2–10 are obtained at pH 9.3–7.7. The strict observance of the pH is not necessary if synthetic scouring means have been used instead of alkali stearates, palmitates, or oleates. If the grease obtained contains more than 1% water, a second centrifugation is necessary after the addition of the phosphate. (*C.A.* 52, 17761)

FATTY ACID DERIVATIVES

α-Amino Acid Derivatives and Fats and Oils Containing It. B. W. Town (Schwarz Labs., Inc.). *U. S. 2,850,387.* A vehicle for enriching foods without causing undesirable browning is prepared by dissolving in a fat between 10 and 20% by wt. of an N-acylated aliphatic α-amino acid. The acyl radical is a saturated or unsaturated C_{10} to C_{24} fatty acid. The α-amino acid is leucine, isoleucine, lysine, valine, methionine or phenylalanine.

Process for Inhibiting Staling of Yeast-Raised Bakery Products. C. W. Ofelt, C. L. Mehltretter and F. H. Otey (Secy. Agr., U. S. A.). *U. S. 2,850,389.* Staling is inhibited by the addition of 0.1 to 1% by wt. of flour of 3-stearoyl-D-glucose to the dough prior to baking.

Cutting Oil Composition. E. C. Hughes and H. M. Stine (The Standard Oil Co.). *U. S. 2,852,468.* A lubricating composition is prepared from 80 to 99% by wt. of a sulfurized mineral oil, 1 to 20% of a partial fatty acid ester (sorbitan monooleate or sorbitan trioleate), and an oil-soluble chlorinated organic E. P. compound.

10,11-Dihydroxy and 10,11-Epoxy-9,12-Diketostearic Acid and Derivatives. J. Nichols (Ethicon, Inc.). *U. S. 2,852,521.* Compounds described included these acids and their sodium, potassium, ammonium, pyridine, diethanolamine and triethanolamine salts.

10,11-Dihydroxy and 10,11-Epoxy-Stearic Acid and Derivatives. J. Nichols (Ethicon, Inc.). *U. S. 2,852,522.* New compounds described include 12-keto-10,11-dihydroxystearic acid, 12-keto-10,11-epoxystearic acid, and their salts with sodium, potassium, ammonia, pyridine, diethanolamine and triethanolamine.

Emulsifying and Stabilizing Compositions for Frozen Confections. N. S. Harrison (N. Harrison Corp.). *U. S. 2,853,391.* The quality of frozen confections is improved by the addition of 0.01 to 0.1% by wt. of an emulsifying agent, such as fatty acid esters of glycol, glycerol, sorbitol and sorbitan, and 0.025 to 0.35% by wt. of a polyphosphate.

Aerosol Sun-Screening Composition. A. L. La Via (Olin Mathieson Chemical Corp.). *U. S. 2,853,423.* An aerosol composition is prepared from a sun-screening agent, a propellant and a water-repellent film-forming liquid ester vehicle of high flash point. The ester has an alkanoic, alkenoic or alkanedioic acid radical of no more than 18 carbon atoms, esterified with a low molecular weight monohydric alcohol, glycol, sorbitol or mannitol.

Linear Polyester Compositions Containing a 2,4,5-Trihydroxy Phenone of a Fatty Acid as a Heat Stabilizer. M. B. Knowles and L. D. Moore, Jr. (Eastman Kodak Co.). *U. S. 2,856,383.* A polyester composition prepared from a dihydric alcohol and two dicarboxylic acids is stabilized against degradation by heat by the addition of 0.1 to 10 parts by wt. of a 2,4,5-trihydroxy phenone of a C_4 to C_{18} fatty acid.

Steeping Process for Preparing Foamable Styrene Polymer Particles Containing Fatty Acid Compound. R. E. Colwell and N. Platzer (Monsanto Chemical Co.). *U. S. 2,857,341.* A process is described for the preparation of foamable styrene particles containing 0.5 to 20 parts of C_{12} to C_{20} fatty acids, their salts or monoesters.

Vinyl Halide Resins Plasticized with Diaceto-Olein and Phosphoric Acid Esters. F. C. Magne, E. L. Skau and R. O. Feuge (Secy. Agr., U. S. A.). *U. S. 2,857,348.* A vinyl chloride, vinyl acetate copolymer is plasticized with a mixture of a nonvolatile liquid ester of phosphoric acid and diaceto-olein.

Polyvinyl Resin Compositions Plasticized with Partially Epoxidized Fatty Acid Esters. F. P. Greenspan and R. J. Gall (Food Machinery & Chemical Corp.). *U. S. 2,857,349.* A plasticizer for polyvinyl resins is prepared by the reaction of a peracid with the lower alkyl or polyhydric alcohol esters prepared from unsaturated oils. The preferred oils have polyethenoid acid contents between those of corn and safflower oils, and nonethenoid acid contents between those of safflower and tall oils.

Method of Producing Ozonides of Unsaturated Fatty Acids. C. E. Thorp and A. J. Gaynor (Cudahy Packing Co.). *U. S. 2,857,410.* Unsaturated fatty acids are reacted in the vapor phase with ozone at sub-atmospheric pressures and temperatures between 176.5 and 360°.

Plastic Compositions Containing Carbonato Esters of Fatty Acids. W. L. Riedeman (Rohm & Haas Co.). *U. S. 2,858,286.* A plasticizer for vinyl halide resins consists of the carbonato ester of a fatty acid derived from natural fats and oils.

Separation of Fatty Acids. J. G. Smull (National Lead Co.). *U. S. 2,858,324.* A mixture of oleic and linoleic acid in methanol or ethanol is partially neutralized with an alkali metal hydroxide and cooled to 0 to 8°. The soap of oleic acid precipitates and is separated. Oleic acid essentially free from linoleic is obtained by acidification of the soap.

Treatment of Fatty Acids. N. C. Hill and V. P. Kuceski (The C. P. Hall Co.). *U. S. 2,858,336.* Metal contaminants are removed from crude fatty acids by washing with nitric acid. The fatty acids are then oxidized with nitric acid, nitrous acid and oxides of nitrogen. The products are dicarboxylic acids substantially free from sodium or iron contaminants.

METHOD FOR SEPARATING A C_{10} STRAIGHT-CHAIN ALIPHATIC DIACID FROM MIXTURES WITH ISOMERS THEREOF. S. A. Mednick, R. Wynkoop and J. Feldman (National Distillers & Chemical Corp.). *U. S. 2,858,337.* Isomeric C_{10} aliphatic dicarboxylic acids are separated by recrystallization from hydrocarbon solvents.

UNSATURATED FATTY ACIDS. A. Marzin. *Ger.* (East) *9560.* Fatty acids, containing at least one halogen atom, are transformed into unsaturated fatty acids by heating at not less than 150° with high boiling alcohols. Esterification also takes place. Compounds used as high boiling alcohols are secondary alcohols with boiling point higher than 150°, e.g., cyclohexanol, mixture of the three isomer methylcyclohexanols, tetrahydronaphthols, and decahydronaphthols. It is possible to apply pressure or to use catalysts for the separation of hydrogen halide. The reaction is suitable for the direct transformation of high molecular weight halogenated fatty acids into drying oils. It is advantageous to esterify the unsaturated fatty acids with polyvalent alcohols. (*C.A.* **52**, 17111)

PREPARATION OF UNSATURATED FATTY ACIDS. A. Marzin. *Ger.* (East) *9566.* For the preparation of unsaturated fatty acids or their esters, chlorinated fatty acids are heated to at least 150° with solids or dissolved alkali hydroxide in the presence of high boiling alcohols or ketones. High boiling alcohols are primary or secondary alcohols with a boiling point above 150°. Fatty acids produced by this procedure are usually yellow or red polymers. They are esterified with polyvalent alcohols, giving quick-drying varnishes. (*C.A.* **52**, 17111)

EXTRACTION OF AZELAIC ACID. Muchio Imai and Takeo Wakabayashi (Nippon Fats and Oils Co.)*Japan 9867('57).* A mixture (1 kg.) composed of 45 parts monobasic fat acid with acid number 220 and 55 parts azelaic acid in an autoclave with water is heated 2–3 minutes with a pressure at 3.5 atmospheres, the superheated water in the lower layer is taken out, the same operation is repeated with 2 kg. water, the aqueous layers are combined, cooled to 2–5° and the crystalline deposit is filtered off to give 403 g. azelaic acid. The residue in autoclave yielded 504 g. monobasic fat acid with acid number 260. (*C.A.* **52**, 17116)

• Biology and Nutrition

ALFALFA CAROTENE. EFFECT OF FAT ON CAROTENE STABILITY IN DEHYDRATED ALFALFA. A. E. Denton and E. R. Bielanski (Research Labs., Swift & Co., Chicago 9, Illinois). *J. Agr. Food Chem.* **6**, 853–55 (1958). The influence of various fats on carotene retention in different samples of dehydrated alfalfa was investigated. Some samples of dehydrated alfalfa with added fat showed greatly improved carotene retention, while others did not. Carotene retention was not improved by antioxidants at the level normally used for the stabilization of fats; however, the use of antioxidants at higher levels may improve carotene retention. Fatty acids did not increase carotene destruction in dehydrated alfalfa, but caused color deterioration.

TASTE PANEL EVALUATION OF THE EFFECT OF ADDED FAT ON THE FLAVOR OF CHICKEN MEAT. K. C. Leong, M. L. Sunde, H. R. Bird and K. G. Weckel (Dept. of Poultry Husbandry and Dairy and Food Industries, Univ. of Wisconsin, Madison, Wisconsin). *Poultry Sci.* **37**, 1170–72 (1958). The results of the two flavor panel evaluations indicated no significant difference in flavor between the meats of the birds fed a diet with 26 percent added fat and meats of those fed without added fat. The average scores obtained for all the samples tested were positive, indicating all were acceptable in flavor. In the case of the skins, there was a preference for the flavor of the skins of the chickens fed the high fat diet. The possible commercial application of these findings is that adverse effect of feeding stabilized inedible choice white grease on the flavor of the broilers is not likely.

SERUM PHOSPHOLIPIDS. GENETIC AND ENVIRONMENTAL INFLUENCES. L. E. Schaefer, D. Adlersberg and A. G. Steinberg (Depts. of Medicine and Chemistry, The Mount Sinai Hospital and the Central Manhattan Medical Group, New York, New York). *Circulation* **18**, 341–47 (1958). Serum phospholipid levels were determined in 1,067 healthy persons aged 2 to 77 years. Phospholipid levels increased with age but in a different way for each of the sexes. The age-sex changes of serum phospholipids were similar to those observed for serum cholesterol. Correlation coefficients in members of 156 families indicated that the genetic factor is of importance in determining the serum phospholipid level in health. Because of the age-sex variations of serum phospholipid and serum cholesterol levels, no single arbitrary line can be drawn between normal and abnormally elevated levels of these 2 serum lipid fractions.

PURIFICATION AND IDENTIFICATION OF BRAIN PHOSPHOLIPIDES ASSOCIATED WITH THROMBOPLASTIC ACTIVITY. D. Therriault, T. Nichols and H. Jensen (Biochemistry Dept., U. S. Army Medical Research Lab., Fort Knox, Kentucky). *J. Biol. Chem.* **233**, 1061–65 (1958). Phosphatidyl serine and lecithin have been isolated from beef brain tissue by means of countercurrent distribution and identified. Neither phosphatidyl serine nor lecithin alone possesses any appreciable thromboplastic activity. When lecithin and phosphatidyl serine are dissolved together in chloroform, however, a potent thromboplastic substance results.

ANHYDROVITAMIN A_2 AND REHYDROVITAMIN A_2. S. Balasundaram, M. S. Bamji, H. R. Cama, P. R. Sundaresan and T. N. R. Varma (Dept. of Biochem., Indian Inst. of Science, Bangalore, India). *J. Biol. Chem.* **233**, 827–32 (1958). Naturally occurring anhydrovitamin A_2 and rehydrovitamin A_2(N) from the liver oil of a fresh-water fish *(Wallago attu)* has been isolated and characterized. Chromatography of *Wallago attu* oil extracted in the cold showed that anhydrovitamin A_2 and rehydrovitamin A_2(N) are not formed as a result of heat treatment during extraction. Anhydrovitamin A_2 could be formed by treatment of vitamin A_2 alcohol with anhydrous ethanolic HCl, but not with *p*-toluene-sulfonic acid, thus confirming the presence of an ethoxy group in anhydrovitamin A_2. Anhydrovitamin A_2, when fed to rats, is transformed into a new compound named rehydrovitamin A_2 in the livers. It is stored as an ester and alcohol in the liver. The partition data on naturally occurring anhydrovitamin A_2 and anhydrovitamin A_2 prepared chemically, and on naturally occurring rehydrovitamin A_2(N) and rehydrovitamin A_2 obtained from rat livers have been compared.

EFFECTIVENESS OF UNKNOWN GROWTH FACTORS, ANTIBIOTIC, AND ANIMAL FAT IN TURKEY POULT RATIONS. P. E. Waibel (Department of Poultry Husbandry, Univ. of Minnesota, St. Paul, Minnesota). *Poultry Sci.* **37**, 1144-49 (1958). Supplementation of ''complete'' poult diets with animal fat resulted in a marked growth response and improvement in feed efficiency, provided the protein level was adequate.

THE PRESENCE OF PHOSPHATIDE ACID IN ANIMAL TISSUES. L. E. Hokin and Mabel R. Hokin (Dept. of Physiological Chem., Univ. of Wisconsin, Madison, Wis.). *J. Biol. Chem.* **233**, 800–4 (1958). After labeling of phospholipides of various tissues with P^{32} both *in vivo* and *in vitro*, a radioactive spot was found on chromatography which yielded over 85% of its radioactivity as glycerophosphate after mild alkaline hydrolysis. By chromatography of this phospholipide with increasing amounts of carrier substances, it was found to be chromatographically indistinguishable from cabbage phosphatidic acid but it could be distinguished from L-α (distearoyl) phosphatidic acid. After hydrogenation of the radioactive phospholipide, the product was not chromatographically distinguishable from L-α (distearoyl) phosphatidic acid. These several lines of evidence indicate that phosphatidic acids occur in animal tissues both *in vivo* and after incubation *in vitro* and that they contain unsaturated fatty acids.

IN VIVO INCORPORATION OF DIETHANOLAMINE INTO LIVER LIPIDES. C. Artom, H. B. Lofland, and J. A. Oates, Jr. (Dept. of Biochem., Bowman Gray School of Med., Wake Forest Coll., Winston-Salem, North Carolina). *J. Biol. Chem.* **233**, 833–7 (1958). Evidence for the incorporation *in vivo* of an analogue of ethanolamine, diethanolamine (DEA) into liver phospholipides has been obtained by paper chromatography and by isotopic techniques applied to the total and partial hydrolysates of the lipides. The DEA-containing compound is precipitated by acetone + magnesium chloride, and accompanies phosphatidyl ethanolamine in the processes of adsorption on, and gradient elution from, a silicic acid column. By mild hydrolysis a product is obtained which, on paper chromatography, behaves as glycerylphosphorylethanolamine, and which, on further hydrolysis, yields free DEA. After feeding of DEA for several days, DEA-containing phospholipides accumulate in the liver.

A STUDY OF THE QUANTITATIVE ESTIMATION OF ETHANOLAMINE AND SERINE IN PHOSPHOLIPIDES. J. C. Dittmer, J. L. Feminella, and D. J. Hanahan (Dept. of Biochem., Univ. of Washington, Seattle, Washington). *J. Biol. Chem.* **233**, 863–7(1958). A procedure is described for the assay of ethanolamine and serine in phosphatidyl ethanolamine-rich fractions from beef liver, rat liver, and baker's yeast.

ACETYLCHOLINE AND THE EXCHANGE OF INOSITOL AND PHOSPHATE IN BRAIN PHOSPHOINOSITIDE. L. E. Hokin and Mabel R. Hokin (Dept. of Pharmacology, McGill Univ., Montreal, Can.). *J. Biol. Chem.* **233**, 818–21 (1958). After incubation of guinea pig brain cortex slices with $NaH_2P^{32}O_4$, the lipides were separated by paper chromatography and five different radioactive phospholipides were identified. These were phosphatidyl choline, phosphatidyl ethanolamine, phosphatidyl serine, phosphatidic acid, and a monophosphoinositide. Two additional unidentified radioactive spots were seen. When the slices were incubated with inositol-2-H^3, the only H^3-labeled phospholipide in lipide extracts was a monophosphoinositide. Acetylcholine stimulates the incorporation of inositol phosphate as a unit into monophosphoinositide. The average stimulation was about 80%. Glycerol-1-C^{14} incorporation in monophosphoinositide was not increased in the presence of acetylcholine. Acetylcholine stimulated the incorporation of P^{32} into phosphatidic acid about 100%. There was no equivalent increase in the incorporation of glycerol-1-C^{14} into phosphatidic acid.

The Role of Lipides in Electron Transport. III. Purification and Identification of a Cytochrome C Reductase Lipide "Cofactor." K. O. Donaldson, A. Nason, I. R. Lehman, and A. Nickon (McCollum-Pratt Inst. and the Dept. of Chem., The Johns Hopkins Univ., Baltimore, Md.). *J. Biol. Chem.* **233**, 566–71 (1958). The lipide "cofactor" present in the crude residue from *n*-hexane extraction of bovine heart muscle was shown to be the corresponding mixed triglyceride. Chemical synthesis of such a triglyceride yielded material essentially identical to the lipide cofactor with respect to biological activity and other criteria. Two other mixed triglycerides were synthesized and shown to have some biological activity.

Phosphatides of Pig Heart Cell Fractions. G. V. Marinetti, J. Erbland, and E. Stotz (Dept. of Biochem., Univ. of Rochester, School of Med. and Dentistry, Rochester, N. Y.). *J. Biol. Chem.* **233**, 562–5 (1958). The phosphatide analysis of the mitochondria, microsomes, and supernatant fluid of pig heart ventricle showed significant differences, especially in the distribution of the individual phosphatides. A lipide, tentatively identified as a polyesterglycerolphosphatide was found to occur almost exclusively in the mitochondria. The ubiquitous nature and cellular localization of this lipide suggest that it may have an important metabolic role.

Composition and Concentration of Lymph and Serum Lipproteins During Fat and Cholesterol Absorption in the Dog. L. A. Hillyard, I. L. Chaikoff, C. Entenman, and W. O. Reinhardt (Dept. Physiol., Univ. of California School of Med., Berkeley, Calif.). *J. Biol. Chem.* **233**, 838–42 (1958). When dogs were fed a meal containing corn oil or corn oil plus cholesterol, an increase in the amounts of low density lipoproteins was observed in serum. No essential changes were found in the ultracentrifugal residue. After the animals were fed cream or the meal containing corn oil and cholesterol, the lowest density fractions of the lipoproteins in the lymph were increased. Five hours after the ingestion of a corn oil-cholesterol meal, the percentage composition of the chylomicron containing fraction was: protein 1.1; phospholipides 5.5; free cholesterol 0.4; cholesterol esters 3.0; and triglycerides 90. In spite of the low concentration of cholesterol in this fraction, practically all of absorbed cholesterol is carried in it.

The Use of Diacetin in Prestaining Serum Lipoproteins. P. Solinas, R. Betti, and E. R. P. DiLeo (Univ. Perugio, Italy). *Clin. Chim. Acta* **2**, 586–7 (1957). A saturated solution of Sudan Black B in diacetin (glyceryl diacetate) is recommended for the prestaining of lipoproteins in serum for paper electrophoretic evaluation. (*C.A.* **52**, 17362)

Number of Free and Bound Lipides in Relation to Age of Diphtheria Cultures. E. K. Alimova. *Trudy Otchetn. Nauch Konf. (Rostov-on Don Med. Inst.) za 1956 g.* (Rostov-on Don) **1957**, 563–6; *Referat. Zhur Khim., Biol. Khim.* **1958**, Abstr. No. 9903. The amount of free and bound lipides increased with the age of the cultures; the free lipides increased 10–11 times. (*C.A.* **52**, 17379)

Vitamin A in the Fat of Seals. L. A. Shel'puk. *Byull. Nauch.-Tekh. Inform. Nauch.-Issledovatel Inst. Sel'sk. Khoz. Krain. Severa* **1957**, No. 2, 11–12; *Referat. Zhur. Khim. Biol. Khim.* **1958**, Abstr. No. 8432. Vitamin A of seal fat ranged between 50–180 milliunits/g. with an average of 100 milliunits/g. Vitaminized fish oil used in animal feeding contains approximately 5 times as much vitamin A. (*C.A.* **52**, 17438)

Effect of Qualitatively Different Fats in the Diet on the Lipides of the Blood Serum of Rats. M. N. Markova (Nutrition Inst., Acad. Med. Sci. U.S.S.R., Moscow). *Voprosy Pitaniya* **17** (3), 30–3 (1958). White male rats were fed for 10 weeks with a basic diet, in which 30% of calories were from sunflower oil, lard, or sunflower oil + lard. As a function of the kind of fat in the diet the following amounts of phospholipides and lecithin were found in the blood serum of the experimental animals: 6.3 ± 0.7, 10.5 ± 1.5, and 8.0 ± 0.9; and 157 ± 17, 262 ± 37, and 200 ± 92.5 mg. % for sunflower oil, lard and sunflower oil + lard diets, respectively. (*C.A.* **52**, 17442)

Influence of Unsaturated Long-Chain and Saturated Medium-Chain Fatty Acid on the Fat Content of the Rat Liver in Choline-Free Diet. F. Hartmann and K. Zehender (Univ. Marburg/Lahn, Ger.). *Arch. exptl. Pathol. Pharmakol.* **234**, 179–84 (1958). Unsaturated fatty acids (linoleic and linolenic acid) have in the choline-deficient rat a marked lipotropic action. This action probably is due to their participation in the synthesis of phosphatides. A mixed glyceride of capric, caprylic, and lauric acids caused, in choline deficiency, fatty livers as did margarine. (*C.A.* **52**, 17439)

Fats, Nutrition, and Arteriosclerosis. G. Schettler and M. Eggstein (Univ. Marburg a.d. Lahn, Ger.). *Deut. med. Wochschr.* **83**, 702–6, 709–10, 150–5 (1958). Normal subjects and hyperlipemic or hypercholesterolemic patients were maintained on high calorie, normal, or low calorie diets with and without supplements of highly saturated and highly unsaturated naturally occurring lipides. Effects of these dietary variations on the cholesterol, esterified fatty acids, phospholipide, and neutral fat of the serum were determined. Isocaloric substitution of 80–100 g. of linseed oil for butter or cocoa fat in the diet of normal subjects caused declines in serum lipide levels. Similar effects were obtained when 30 g. of linseed oil was added to a calorically adequate low-fat diet. The significance of the results with respect to the dietary content of multiple unsaturated fatty acids was discussed. (*C.A.* **52**, 17439)

Content of Cholesterol in the Lipides in the Scales of the Skin in Psoriasis. E. E. Tello and B. A. Macola. *Rev. asoc bioquim arg.* **22**, 282–6 (1957). This is a study of the lipide composition of scales from the skin in psoriasis. The value found for cholesterol was 1786 mg. %, and total lipides 8320 mg. % of material dried for two hours at 100–105°. (*C.A.* **52**, 17470)

A Rapid Method for Fat Extraction from Fatty Tissue. V. I. Piul'skaya. *Myasnaya Ind. S.S.S.R.* **29**(1), 9–10 (1958). Grind fatty tissue or fatty meat product, weigh a 5-g. sample, mix thoroughly with 15 g. anhydrous sodium sulfate, transfer the mixture to a 250- to 300-ml. Erlenmeyer flask, and 25 ml. chloroform, shake the resulting mixture for one minute, and separate the liquid phase immediately by filtration. This method of the fat extraction compared favorably with other more tedious methods such as blending in a Waring blendor. (*C.A.* **52**, 17756)

Studies on Phospholipids. 3. Determination of Choline. L. W. Wheeldon and F. D. Collins (J. Curtin School of Medical Research, Australian Natl. Univ., Canberra, A.C.T., Australia). *Biochem. J.* **70**, 43–5 (1958). A method for the microdetermination of choline in lipid hydrolysates is described. The choline is precipitated with phosphomolybdic acid. The washed precipitate is dissolved in acetone. Sulfuric acid and $SnCl_2$ are added and the optical density of the blue solution is measured. Results agree closely with those determined by the reineckate method. 4. Determination of Ethanolamine and Serine. *Ibid.* 46–9 (1958). Phospholipid extracts are reacted with 1-fluoro-2,4-dinitrobenzene and hydrolyzed with ethanolic HCl, and then with aqueous HCl. A mixture of dimethylformamide-ethanol-*n*-butylamine and tetramethylammonium hydroxide is added. Extinctions are measured at 393 and 500 mμ. Equations for the calculaton of serine and ethanolamine concentrations from these data are given. Serine and ethanolamine contents of lipids from guinea pig kidney, liver, heart and brain, rat brain, sheep brain, egg yolk, and a serine-rich fraction of ox-brain lipids are reported.

Microdetermination of the Fatty Acids in Blood Serum. N. A. Pikaar and J. Nijhof (Univ. Hospital, State Univ. of Utrecht, the Netherlands). *Biochem. J.* **70**, 52–7 (1958). A procedure is described for the hydrolysis and extracton of fatty acids from serum. Polyethenoid acids are determined by alkali isomerization. Saturated fatty acids are determined by reverse-phase chromatography on a rubber column. Monoethenoid fatty acids are calculated by difference. Values for normal human blood are reported and show that 40% of the serum fatty acids are monoethenoid, 30% are polyethenoid (principally linoleic and arachidonic) and 30% are saturated (chiefly palmitic).

The Component Acids and Glycerides of the Depot Fat of an Indian Panther *(Panthera pardus fusca)*. S. P. Pathak and B. N. Trivedi (Banaras Hindu Univ., Banaras-5, India). *Biochem. J.* **70**, 103–7 (1958). Fatty acids from abdominal depot fat were fractionated by the lead salt-ethanol method and then by ester distillation. Glycerides were fractionated by crystallization from acetone. Fatty acids (as % by wt.) were:

myristic 2.3; palmitic 20.1; stearic 13.7; arachidic 1.7; tetradecenoic 1.8; hexadecenoic 10.8; oleic 39.2; octadecadienoic 2.1; C_{20-22} unsaturated 8.3. The glyceride composition closely follows Hilditch's rule of even distribution.

LIPID REQUIREMENTS FOR THE GROWTH OF PLEUROPNEUMONIA-LIKE ORGANISM. P. F. Smith and R. J. Lynn (Dept. Microbiol., School of Medicine, Univ. Penna., Philadelphia). *J. Bacteriol.* **76**, 264–9 (1958). These pleuropneumonialike organisms grew best when media contained cholesterol and a phospholipid or surface active agent in addition to protein. Cholesterol could not be adequately replaced by sterols other than dihydrocholesterol or possibly β-sitosterol. Some sterols were growth inhibitors. Lower fatty acid esters of cholesterol had some growth activity. The lecithin requirement could be met partially with sodium cholate but not with cephalin or higher fatty acids. Acetate was a growth stimulant.

LECITHINASE FROM BACILLUS ANTHRACIS. R. D. Costlow (Ft. Detrick, Frederick, Md.). *J. Bacteriol.* **76**, 317–25 (1958). A lecithinase was isolated by $(NH_4)_2SO_4$ precipitation from a cell-free culture filtrate of *Bacillus anthracis*. Lyophilized enzyme preparations gave a typical lecithovitellin reaction in egg-yolk broth and hydrolyzed purified soybean lecithin. A divalent cation was required for activity of the enzyme on soybean lecithin but inhibited reaction with egg lecithin. The enzyme apparently was not specific for lecithin but slowly hydrolyzed cephalin as well. The end products of soybean lecithin and cephalin hydrolysis were identified by paper chromatography as phosphorylcholine and phosphorylethanolamine, respectively.

SOME NUTRITIONAL AND ALLIED PROBLEMS CONFRONTING THE FOOD MANUFACTURER: TECHNOLOGICAL ASPECTS OF ANTIOXIDANTS. C. H. Lea (Low Temp. Station for Research in Biochem. & Biophysics, Univ. Cambridge). *J. Sci. Food Agr.* **9**, 621–32 (1958). Primary antioxidants, synergists and metal deactivators for use in the stabilization of food products are discussed. Methods of testing and applying antioxidants are reviewed briefly. The effectiveness of various antioxidants in the following foods is summarized: vegetable and animal oils and fats, essential oils, milk and butter, fish and meat, carotenoids and vitamin A, dried green crop and animal feeds, fish meal, and oxidized fats and irradiated foods.

EFFECT OF ANTIOXIDANTS ON DIETARY NECROTIC LIVER DEGENERATION. K. Schwarz (Natl. Inst. of Arthritis and Metabolic Diseases, N.I.H., Bethesda, Md.). *Proc. Soc. Exptl. Biol. Med.* **99**, 20–4 (1958). Thirteen antioxidants were tested at various dose levels for effectiveness in protecting rats against dietary liver degeneration induced by a vitamin E-deficient, 30% *Torula* yeast ration. At levels of 0.5%, ascorbic acid and methylene blue showed some activity but did not afford more than 30 to 40% protection even at higher dose levels. Antabuse (0.2%) was ineffective. At levels up to 0.5% in the diet the following were inactive: NDGA (nordihydroguaiaretic acid), *n*-propyl gallate, DBPC (2,6-di-*tert*-butyl-4-methylphenol), BHA (mixed 2- and 3-*tert*-butyl-4-methoxyphenol), and hydroquinone. Di-*tert*-amyl-hydroquinone and Santoquin (6-ethoxy-1,2-dihydro-2,2,4-trimethylquinoline) inhibited the deficiency strongly at 0.25% levels in the diet. Santoflex B (6-phenyl-1,2-dihydro-2,2,4-trimethylquinoline) at 0.05 to 0.25% was slightly active. DPPD (N,N′-diphenyl-*p*-phenylenediamine, food grade) came close to vitamin E in activity; 5 mg. % DPPD was approximately as effective as 1.25 mg. % D,L-α-tocopheryl acetate.

SYNTHESIS OF CHOLESTEROL BY A STRAIN OF HUMAN UTERINE FIBROBLASTS PROPAGATED IN VITRO. D. L. Berliner, H. E. Swim and T. F. Dougherty (Univ. Utah Medical School and Western Reserve Univ. School of Medicine). *Proc. Soc. Exptl. Biol. Med.* **99**, 51–3 (1958). Strain U12-79 of human uterine fibroblasts propagated *in vitro* for almost 5 yrs. was grown in a medium containing acetate-2-C^{14}. Labeled cholesterol was isolated from both the cells and the medium.

INFLUENCE OF LONG TERM FAT-FEEDING ON EXCRETION OF CHOLESTEROL-4-C^{14} METABOLITES. J. D. Wilson and M. D. Siperstein (Dept. Internal Medicine, Univ. Texas Southwestern Medical School, Dallas). *Proc. Soc. Exptl. Biol. Med.* **99**, 113–16 (1958). Rats were pair-fed for 72 days on fat-free, 30% corn oil or 30% lard rations. Average weight gains were, respectively, 134, 123, and 141 g. Average daily dry weights of feces were comparable. Rats fed the corn oil or lard diets uniformly excreted more C^{14} than did rats fed diets containing no fat. Excretion of bile acid-C^{14} and digitonin precipitable neutral sterol-C^{14} tended to be highest in the rats fed lard. The most striking difference among the groups was the marked increase in excretion of non-digitonin precipitable neutral sterols in the rats fed corn oil. This accounted for 18–25% of the administered dose of C^{14}. This non-digitonin precipitable neutral sterol does not contain a ketonic group and is presumably a 3-alpha-hydroxy sterol.

INHIBITORY EFFECT OF A SERUM PROTEIN ON DEVELOPMENT OF OPALESCENCE IN LIPOPROTEINS ALTERED BY LECITHINASE C. Elma Krumwiede (Dept. Pediatrics, N. J. Univ.-Bellevue Medical Center, N. Y. City). *Proc. Soc. Exptl. Biol. Med.* **99**, 151–6 (1958). Although α_1 lipoprotein fractions from horse sera become opalescent with or without development of a precipitate following hydrolysis of the phospholipids by lecithinase C, cholesterol and the diglyceride portion of phospholipids remain bound to protein. A lipid-free protein from human and horse sera was found to suppress development of opalescent in α_1 lipoprotein fractions and whole human sera treated with lecithinase C.

SERUM CHOLESTEROL DETERMINATIONS AS AFFECTED BY VITAMIN A. Lois J. Kinley and R. F. Krause (Dept. Biochem., W. Va. Univ. Medical Center, Morgantown, W. Va.). *Proc. Soc. Exptl. Biol. Med.* **99**, 244–5 (1958). Study was made of the effects of various levels of vitamin A in the determination of serum total cholesterol by means of a ferric-chloride color reagent or a saponification-extraction method. Results show that vitamin A must be separated from the serum before colorimetric determination of cholesterol by the ferric chloride method.

ACCELERATION OF VITAMIN E DEFICIENCY BY TORULA YEAST. II. EFFECT OF TORULA YEAST ASH AND LIPID. J. G. Bieri, G. M. Briggs and C. J. Pollard (Lab. Nutrition and Endocrinol., Nat. Inst. of Arthritis and Metabolic Diseases, P.H.S. Bethesda, Md.). *Proc. Soc. Exptl. Biol. Med.* **99**, 262–5 (1958). When added to a purified basal diet low in vitamin E and selenium, the ash of *Torula* yeast was found to promote exudative diathesis in chicks. Lipid isolated from the yeast and tall oil also had a similar effect. It is concluded that the anti-vitamin E property of *Torula* yeast is due to both its unsaturated fatty acid and mineral contents. The relatively high content of dienoic acid previously reported for lipid of *Torula* yeast is confirmed.

DIET AND ATHEROSCLEROTIC DISEASE. IV. EPIDEMIOLOGY OF CORONARY HEART DISEASE IN THE UNITED STATES. J. Stamler (Cardiovascular Dept., Medical Research Institute, Michael Reese Hospital, Chicago, Ill.). *J. Am. Dietet. Assoc.* **34**, 1053–9 (1958). Data are reviewed under the following headings: trends in the American diet, sex differential in deaths from arteriosclerotic heart disease, urban and rural mortality rates, death rates in nationality groups, socio-economic and racial factors, U. S. diets at different economic levels, serum cholesterol in various strata of the U. S. population. The hypothesis is suggested that when intake of calories, fats, saturated fats, and cholesterol is high, there is a nutritional imbalance which favors hypercholesterolemia and atherogenesis. V. DIET—A KEY, BUT NOT EXCLUSIVE ETIOLOGIC AGENT. *Ibid.*, 1060–4. Results of recent research are reviewed in relation to psychological stress and sedentary living, interaction between diet and other factors, preliminary findings of recent epidemiologic studies, possibility of individual actuarial prediction, and possibly a reducing risk. It is concluded that atherosclerosis is a distinct, preventable metabolic disease. Altered cholesterol-lipid-lipoprotein metabolism plays a critical and decisive role. The atherogenic alterations in the metabolism of these lipids are a by-product of an habitually unbalanced diet.

SPECIES DIFFERENCES IN CHOLESTEROL BIOSYNTHESIS BY ARTERIAL TISSUE. D. L. Azarnoff (Dept. Medicine, Univ. Kans. Med. Center, Kansas City, Kan.). *Proc. Soc. Exptl. Biol. Med.* **98**, 630–3 (1958). *In vitro* tests with arterial tissue showed that coronary arteries and aortas or humans and aortas of dogs, cats and rats cannot incorporate C^{14}-labeled acetate into cholesterol. Aortas of guinea pigs, rabbits and chickens can accomplish this conversion.

PRE-STAINING PROCEDURE FOR ELECTROPHORETIC STUDY OF SERUM LIPOPROTEINS. A. A. Wilcox, P. T. Wertlake, M. I. Haley and J. E. Peterson (Depts. Biochem. and Intern. Medicine, School of Medicine, College of Medical Evangelists, Loma Linda, Calif.). *Proc. Soc. Exptl. Biol. Med.* **98**, 718–21 (1958). Human serum is mixed with a saturated solution of acetylated Sudan Black B and heated for 10 to 15 min. at 70°. The resulting dye-lipoprotein complexes are separated on paper by electrophoretic procedure. Reproducibility of the α- and β-lipoprotein values determined by this method was better than is usually achieved when lipoprotein spots are located by staining paper strips after electrophoresis of serum. Data are reported for the β/α-lipoprotein values in groups of women having average ages of 20 and 84 yrs., and groups of men having average ages of 25 and 74 yrs.

Response of Arterial Wall to Intramural Cholesterol. M. G. Netsky and T. B. Clarkson (Bowman Gray School of Medicine, Wake Forest College, Winston-Salem, N.C.). *Proc. Soc. Exptl. Biol. Med.* **98**, 773–4 (1958). Injection of cholesterol into the wall of the artery in chicken caused by a foreign body reaction at the site of injection and a localized intimal plaque formation. The development of these plaques was not affected by the addition of cholesterol, lard or corn oil to the diet.

Effect of Beta-Sitosterol on Regression of Hypercholesterosis and Atherosclerosis in Chickens. E. R. Diller, B. L. Woods and O. A. Harvey (Biochem. Research Div., Lilly Research Labs., Indianapolis, Ind.). *Proc. Soc. Exptl. Biol. Med.* **98**, 813–17 (1958). Withdrawal of dietary cholesterol or administration of beta-sitosterol in presence or absence of dietary cholesterol reduced previously elevated cholesterol concentrations in liver, serum and aorta of chickens. When 4% beta-sitosterol was fed, the total sterol content of the liver was slightly lower than in birds fed the basal diet only and the total sterol contents of serum and aorta also tended to be lower. Atheroma regression was paralleled by a drop in cholesterol concentrations in the blood and liver of birds given beta-sitosterol.

Technics for Separation of Plasma Cholesterol Esters for Determination of Iodine Value, and of Cholesterol. G. D. Michaels, G. Fukayama, H. P. Chin and Priscilla Wheeler (Institute for Metabolic Research, Highland-Alameda County Hospital, Oakland, Calif.). Oakland, Calif.). *Proc. Soc. Exptl. Biol. Med.* **98**, 826–9 (1958). A method for the quantitative chromatographic separation of cholesterol esters from other blood lipids is presented. A colorimetric micromethod for determination of the iodine number of plasma lipid is described. A colorimetric procedure for the determination of cholesterol with an orcinol reagent is described.

Plasma Cholesterol Ester Fatty Acid Composition in Relation to Diet. L. W. Kinsell, G. D. Michaels, G. Fukayama, Sadie Smyrl, Florence Olson and H. P. Chin (Institute for Metabolic Research, Highland-Alameda County Hospital, Oakland, Calif.). *Proc. Soc. Exptl. Biol. Med.* **98**, 829–33 (1958). Administration of large amounts of purified linoleic acid preparation to diabetic and nondiabetic patients resulted in a marked increase in the dienoic acid content of plasma cholesterol esters and a lowering in the monoenoic acid content. When ethyl oleate was substituted for the ethyl linoleate the opposite pattern was observed. A high carbohydrate, fat-free diet had much the same effect on plasma cholesterol composition as did ingestion of ethyl oleate.

Amendment for Legume Feeds. A. A. Horvath. *U. S. 2,849,-317.* A feed meal is prepared by mixing alfalfa, clover and soybean oil meal with 0.1 to 2% of creosote bush leaf.

• Paints and Drying Oils

Determination of the Metal Content of Paint Driers. EDTA Titration in Alcohol-Benzene Solutions. C. A. Lucchesi and C. F. Hirn (Analytical Research Dept., The Sherwin-Williams Co., Chicago, Illinois). *Anal. Chem.* **30**, 1877–79 (1958). A simple titrimetric method for the determination of the metal content of calcium, cobalt, lead, manganese, and zinc driers is rapid, precise, and yields results in close agreement with those obtained by gravimetry and flame photometry. The new method is based upon the reaction of metal ions with the chelating agent, ethylenediamine tetraacetic acid (EDTA). Only 0.2 gram of sample is required, and a single determination can be made in 10 minutes. The coefficient of variation of the method is estimated to be 0.8%.

Promising Materials for Protective Coatings. Vinyl Ethers of Polyunsaturated Fatty Alcohols. H. M. Teeter, L. E. Gast and J. C. Cowan (Northern Utilization Research and Development Div., Agricultural Research Service, U. S. Dept. of Agriculture, Peoria, Illinois). *Ind. Eng. Chem.* **50**, 1703-4 (1958). Polymers of vinyl ethers from linseed and soybean oils dry to films that adhere well to metal and are alkali-resistant. These organic compounds hold promise as coatings for cans and other metallic articles.

Yield in Epoxidation Reactions. H. C. Wohlers, M. Sack and H. P. LaVan (Solvay Process Div., Allied Chemical Corp., Syracuse, New York). *Ind. Eng. Chem.* **50**, 1685–86 (1958). Two new methods have been developed for improving yields in epoxidation reactions—one uses partially preformed acetic acid and the other, agitation control.

Polyalkylene Glycol Modified Alkyd Resin—Aminotriazine—Aldehyde Resin and Synthetic Polymeric Latex. R. M. Christenson, L. O. Cummings and D. P. Hart (Pittsburgh Plate Glass Co.). *U. S. 2,852,475.* A water-dispersed coating composition is prepared from (a) the heat reaction product of a polyalkylene glycol and an alkyd made from a polycarboxylic acid, a polyhydric alcohol, and fatty acids of a drying oil, (b) a water-soluble aminotriazine-aldehyde resin and (c) a synthetic polymeric polystyrene or polyvinyl latex.

Coating Composition Consisting of an Oil-Modified Alkyd Resin, an Amine Aldehyde Resin, and a Synthetic Resin Latex. L. O. Cummings (Pittsburgh Plate Glass Co.). *U. S. 2,852,476.* A coating composition is prepared from an amine salt of an oil modified alkyd resin, a water-soluble aminealdehyde resin, and a synthetic polymeric latex such as polystyrene latex, polyvinyl chloride latex, butadiene-styrene copolymer latex or an acrylic resin latex.

Polyphase Copolymerization of Styrene Compounds with Drying Oil Fatty Acid Compounds. C. Boelhouwer, F. A. De Roos and H. I. Waterman (Shell Development Co.). *U. S. 2,852,478.* A process is described for the copolymerization of a styrene compound with a drying oil by heating to temperatures between 150° and 300°.

Bodying Vegetable Drying Oils with Resins. D. F. Koenecke (Esso Research & Engineering Co.). *U. S. 2,853,396.* A process is described for the preparation of a drying oil composition by heating a mixture of the copolymer of a C_4 to C_5 conjugated diolefin and styrene, a drying or semidrying oil, and oil-soluble resin at a temperature between 265° and 300° until the desired consistency is reached.

Wrinkle Drying Coating Composition Containing Fish Oil. B. E. Lederman (Midland Chemical Corp.). *U. S. 2,853,458.* A wrinkle drying coating composition is prepared from a resin-modified phenol formaldehyde resin, raw tung oil, oiticica oil, air-blown and heat-bodied fish oil having an iodine number between 180 and 225, xylol, varnish makers' naphtha and a cobalt naphthenate drier.

Aqueous Composition Containing Oil Modified Alkyd Resin and Lower Alkanol Modified Melamine-Aldehyde Resin. R. M. Christenson and D. P. Hart (Pittsburgh Plate Glass Co.). *U. S. 2,853,459.* An oil-free, water-dispersed coating composition is prepared from a glyceride modified phthalic alkyd resin further modified with a polyalkylene glycol and mixed with a water-soluble lower alkanol-modified melamine-aldehyde resin.

Oil-Modified Alkyd Resin. B. A. Bolton (Standard Oil Co.). *U. S. 2,856,374.* An alkyd resin is prepared from a glycol (ethylene, polyethylene, propylene or polypropylene glycol), a vegetable or marine oil or fatty acids having at least 10 carbon atoms, and an acidic material selected from the group: trimesic acid, trimellitic acid, hemimellitic acid, trimellitic anhydride and hemimellitic anhydride.

Coating Compositions Comprising an Oil-Modified Alkyd Resin and Nitrocellulose. A. N. Walus (E. I. du Pont de Nemours & Co.). *U. S. 2,857,344.* A liquid coating composition is prepared from pigment, a volatile organic solvent, a nitrocellulose lacquer, and a copolymer of butyl methacrylate and an alkyd resin. The alkyd resin is prepared from coconut oil or coconut fatty acids, maleic anhydride, phthalic anhydride and glycerides.

Paint Composition Containing Vehicle Comprising Vinyl Toluene-Siccative Oil Copolymer and Nondrying Alkyd Resin. J. W. de Groot, Jr., and B. F. Hofferth (Armstrong Cork Co.). *U. S. 2,857,347.* A paint vehicle is prepared from 90 to 70% by wt. of a vinyl toluene-drying oil copolymer and 10 to 30% by wt. of a nondrying alkyd resin which has been prepared from a nondrying glyceride oil, polyhydric alcohol and an aromatic dibasic acid.

Esters of Drying Oil Acids with Vinyl Polymers. R. M. Ringwald and N. W. Hanson (Imperial Chemical Industries Ltd.). *Brit. 793,776.* Esters of copolymers of esters such as glycidyl methacrylate and polymerizable vinyl compounds with drying oil acids, i.e., those derived from linseed oil, tung oil, etc., are useful in the manufacture of coating compounds. Those containing 30–75% drying oils are preferred. They are prepared by reaction of a drying oil with a preformed copolymer or by reaction of the acid with a glycidyl compound and then copolymerizing the ester formed with a vinyl compound. The copolymers are prepared by heating in the presence of an organic peroxy catalyst. The esters are soluble in a wide range of solvents. (*C.A.* **52**, 17755)

Drying Oils. H. P. Kaufmann. *Ger. 938,738.* Mixed esters of multivalent alcohols with highly unsaturated fatty acids and saturated low-molecular fatty acids give drying oils for paints.

Mixed esters are obtained by reesterification of highly unsaturated oils with esters of saturated low-molecular fatty acids in the presence of tin as a catalyst. (*C.A.* **52**, 17753)

• Detergents

Nitrogen-Containing Surfactants. P. L. DuBrow (Armour & Co., Chicago, Ill.). *Soap Chem. Specialties* **34**(8), 45–7, 91 (1958). The cationics function by a positive attraction to a negatively-charged surface, altering that surface to reflect the characteristics of the substituent group around the nitrogen atom. As a result of their properties, they may be used to contribute hydrophobic compatibility, softening, corrosion inhibition, antistatic activity, germicidal activity and emulsification.

The Present Role of Detergents in Toilet Bar Manufacture. J. W. McCutcheon (John W. McCutcheon, Inc., New York 17, N. Y.). *J. Soc. Cosmetic Chemists* **9**, 270–3 (1958). The specifications for an ideal synthetic bar are outlined as follows: The bar should be the equivalent of a good toilet soap bar with respect to detergency, foam power, solubility and stability. It should behave physically like a soap bar. The density should be reasonably close to soap. It should have a precipitable curd with hard water that remains dispersed in reasonably hard water, the pH should lie between 7 and 8. Means of obtaining a bar having the above specifications are discussed using currently available detergents and manufacturing equipment.

Phase Relations and Specific Salt Effects in Soap Solutions. T. Nash. *Chem. & Ind.*, **1958**, 590. A dilute soap solution forms a two-component system, partially miscible in the liquid state (solution and micelles), the solid phases being soap crystals and ice. It should therefore have an ''invariant point,'' i.e., a temperature, not dependent on concentration, at which both crystals and micelles are present together. The invariant point was determined for cetyltrimethylammonium bromide and cetylpyridinium bromide by fluorescence measurements after the addition of a fluorescent dye of opposite charge, and the effect of salts thereon was noted.

Adsorption Complexes of Polymers with Wetting Agents. II. S. Saito (Univ. Osaka) *Kolloid-Z.* **158**, 120–30 (1958). Reaction between nonionic polymers and anionic wetting agents (I) in H_2O were studied by observing the solubilization (II) of oil-soluble dyes. II takes place by inclusion of solubilizate in places surrounded by dehydrated polymer and I. The synergistic effect of polymers and I depends on the degree of polymerization. This effect is only observed weakly with cationic wetting agents at long alkyl chain length. (*C.A.* **52**, 17761)

Improved Saponification Number Determination by Use of Ion Exchange. W. B. Swann, R. J. Zahner and O. I. Milner (Socony Mobil Oil Co., Inc., Paulsboro, N. J.). *Anal. Chem.* **30**, 1830–3 (1958). A method has been devised in which the saponified material, in nonaqueous medium is passed through a cation exchanger. The excess caustic is converted to water and the salts of the organic acids are converted to the free acids, which are titrated potentiometrically. The procedure greatly simplifies the determination of the end point, eliminates the need for precautionary measures to prevent absorption of carbon dioxide, and gives additional information on the nature of the organic acids comprising the original esterified material.

Boosting Salt, Glycerine Recovery. E. T. Webb. *Soap Chem. Specialties* **34**(6), 54–6, 190; (7) 127, 129, 131, 167; (8) 147–8 (1958). Various methods, amount of recovery, percentage recovery and cost calculations for recovering glycerine from salt used in soap manufacturing are discussed in great detail.

Advances in Shampoo Formulation. F. V. Wells. *Soap Chem. Specialties* **34**(8), 39–42, 178; (9) 161, 163, 165, 207 (1958). The history, developments and various formulations of both soap and detergent type shampoos are discussed. The fact that a soap-base shampoo properly formulated to disperse lime soap is still a very efficient product is pointed out. The many detergent blends now possible by use of new products are also described.

The Solubility of Calcium Soaps. J. T. Yoke, III (Procter & Gamble Co., Cincinnati, O.). *J. Phys. Chem.* **62**, 753–5 (1958). A radio-tracer technique involving Ca^{45} was used to determine the solubility. Solubilities were also checked by weighing the residue left on evaporation of large volumes. The following solubilities in mole/1, at 26.7° and 60°, respectively, were obtained: Ca stearate 2.7 x 10^{-6}, 1.0 x 10^{-6}; Ca palmitate 2.8 x 10^{-6}, 1.5 x 10^{-6}; Ca laurate 4.21 x 10^{-5}, 4.68 x 10^{-5}, Ca oleate 1.34 x 10^{-5}, 2 x 10^{-4}. Marked changes in the x-ray diffraction patterns of Ca stearate, palmitate, and laurate were observed on equilibration with water; this indicated true hydration of the crystal. The solid phase in equilibrium with the saturated solution was monohydrated. (*C.A.* **52**, 16012)

Modernization of European Toilet Soap Making. H. Zilski (MIAG Muehlenbau und Industrie G.m.b.H. Braunschweig, Ger.). *Soap Chem. Specialties* **34**(5), 187, 189, 191, 193; (8) 137, 139, 141 (1958). The progress made in modernizing European soap making is described. New equipment used is discussed and consists of such items as drum driers, vacuum driers, expansion driers, modern amalgamators and vacuum extrusion presses.

Low Foaming Non-Ionic Surface-Active Agents. E. W. Lane (Rohm & Haas Co.). *U. S. 2,850,535.* A high-foaming alkylphenoxypolyethoxyethanol detergent is converted into a low-foaming, more versatile detergent by reacting the compound at high temperatures with acidic catalyst such as strongly acidic cation-exchange resins and acid-treated clays.

Detergent Composition. C. E. Buch (Colgate-Palmolive Co.). *U. S. 2,855,367.* Detergent compositions are prepared possessing a high degree of detergent power and the ability to produce a suitable minimum amount of foam when used in tumbler type automatic washing machines in normal concentrations in either hard or soft water. They consist of a water-soluble polyalkylene oxide detergent condensate of alkyl phenols and higher aliphatic monohydric alcohols, a water-soluble salt of a high alkyl aryl sulfonate, and a higher aliphatic alcohol which controls the foam.

Improved Detergent Bars. Thomas Hedley & Co., Ltd. *Brit. 796,627.* A detergent milled bar having a characteristic soap-like feel consists of sodium soap, a normally solid anionic synthetic detergent and as the binder, a gelatinized non-waxy starch.

Detergent Compositions. Thomas Hedley & Co., Ltd. *Brit. 797,119.* The skin irritating properties of the alkyl sulfate detergents and alkyl benzene sulfonates are lessened by the addition of minor proportions of the sulfated and neutralized condensation products of high molecular alcohols with ethylene oxide or propylene oxides.

Improvements in Soap Compositions. Armour & Co. *Brit. 799,279.* An improved non-cracking toilet soap bar with improved water solubility can be prepared by substituting a small amount of ''Tetronics'' (a condensation product of ethylene diamine with propylene and ethylene oxide) for the coconut oil used in soda and potash soap formulations.

Improved Process of Preparing Ester and Amide Type Anionic Surface Active Agents. General Aniline & Film Corp. *Brit. 799,909.* Surface active esters and amides are prepared by heating a carboxylic acid with an alkali metal, alkaline earth metal or a tertiary amine salt of a taurine or of a 2-hydroxy-alkane sulfonic acid in the presence of a boron-containing compound as a catalyst at reduced pressure, or in an inert atmosphere. All of the salts are converted to the final product free from any inorganic salt. Therefore this salt-free product is useful for built-soap bar type formulations, etc.

Improvements in Detergent Compositions. Unilever Ltd. *Brit. 799, 421.* A uniform, non-separable spray-dried detergent composition is produced by adding a small amount of soap to the composition otherwise consisting of a mixture of a compound obtained by condensing ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol and a condensate of an alkyl phenol with oxide along with alkaline inorganic salts.

Improvements in Detergent Tablets. C. E. Harvey and F. I. G. Small (Unilever Ltd.). *Brit. 799,075.* A detergent tablet having improved properties consists of from 50 to 70% by weight of the tablet of sodium fatty-acyl-aminomethane-sulfonates having from 10 to 18 carbon atoms in a fatty acyl group, from 10 to 20% of sodium or potassium soap having from 10 to 18 carbon atoms in the molecule and from 7 to 16% of a plasticizer such as a fatty amide or lanolin or mixture of the two.