TABLE II
Fractionation of Polymerized Linseed Oil with Acetone

Properties	Extraction temperature, °C.						
	10	20	30	40	50	55	55[a]
d^{25}_{4}	0.9416	0.9464	0.9558	0.9689	0.9739	0.9657	0.9608
n^{25}_{D}	1.48212	1.48412	1.48738	1.49245	1.49377	1.48720	1.49549
η_{30} (stokes)	3.542	5.592	15.06	80.70	177.3	too viscous	too viscous
M.W.[b] = 300	14.83%	10.38%	4.84%	2.10%	0.70%	—	0.97%
M.W. = 600	6.36	6.83	7.38	10.88	1.33	—	0.24
M.W. = 900	42.56	38.04	27.80	18.26	7.13	—	1.90
M.W. > 900	36.25	47.75	59.98	68.74	90.83	—	96.89

[a] Insoluble in acetone at 55°C. [b] From molecular distillation (6).

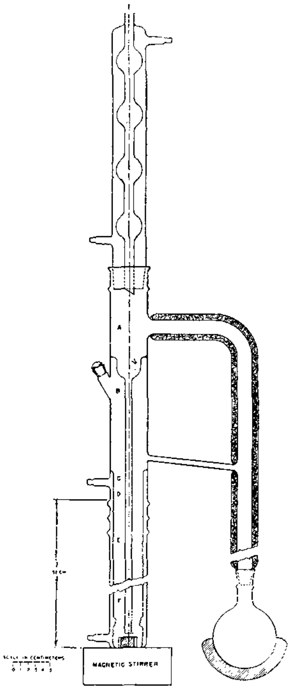

FIG. 1. All-glass, thermostated, liquid-liquid extractor.

TABLE I
Variation in Liquid Temperature with Jacket Temperature[a]

Jacket temperature °C.	Temperature, °C., at various thermocouple positions					
	A	B[b]	C	D	E	F
Air at 25°C.	56	55	55	52	30[c]	30[c]
Water at 10°C.	56	54	35	24	10	10
Water at 20°C.	56	54	35	22	20	20
Water at 30°C.	56	54	37	33	31	30
Water at 40°C.	56	54	45	42	41	40
Water at 50°C.	56	54	51	50	50	50

[a] Temperature measured one hour after start of experiment.
[b] 2°C. cooler when liquid return-line cooled at 24°C.
[c] Rose to 50°C. over-night.

1). In the absence of thermostatic control the temperature of the liquid being extracted rose to within 5°C. of the boiling point of the solvent because the solvent vapor heated the area above the surface of the liquid. The limited reduction in temperature when the liquid return-line was cooled (Table I) suggests that hot vapor enters the extractor through the pressure-equallizing hole as well as the liquid return-line. However the extractor has been operated successfully within 1°C. of the boiling point of the solvent, acetone or pentane.

The extractor has been used to separate heated linseed oil into fractions on a temperature basis (Table II). The data show that this equipment permits extraction over a wide range of operating conditions and demonstrate the advantages of extracting at different temperatures in the event of mutual solubility of the solvent and raffinate.

The apparatus has also been used to remove heat-labile material, *e.g.*, ether-soluble substances from liver homogenates, and to extract mono- and dicarboxylic acids from oxidation mixtures (5). In both of these operations low boiling-point solvents are required, and the ability of this apparatus to operate to within 1°C. of the boiling point of the solvent made these extractions possible.

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ABSTRACTS . . . R. A. REINERS, Editor

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

• Oils and Fats

Absorption of fatty acids from aqueous solutions by active charcoal. Kentaro Ito and Kinnosuke Fukao (Sci. Res. Inst., Tokyo). *Kagaku Kenkyusho Hôkoku* 33, 41-4(1957). Adsorption of valeric acid, caproic acid, and heptylic acid by sugar charcoal was studied at various steps of activation. The longer the chain of the fatty acid the lower seems the degree of adsorption by the same charcoal when compared at the concentrations of half saturation. The calculated monolayer adsorption value, and also the heat of adsorption tend to increase with the advancement of the activation process. (*C.A.* **52**, 39)

Quality of whale oil. XXIII. Quality and properties of coastal baleen whale oil. Shunichi Okura and Mikio Mori (Res. Lab. Nippon Marine Products Co., Odawara). *Nippon Suisan Kabushikikaisha Kenkyusho Kokoku* **8**, 45–50 (1957).

XXIV. Properties of Antarctic baleen whale oil, especially the yearly variation of its iodine number. Shunichi Okura and Mitsuo Nagata. *Ibid.* 51–6.

XXV. Oil content of Antarctic fin whale blubbers and the iodine number of blubber oil. Shuichi Okura, Yoshihiko Taguchi and Mitsuo Nagata. *Ibid.* 57–64.

XXVI. Oil content of Antarctic blue whale blubbers and the iodine number of blubber oil. Shunichi Okura, Mitsuo Nagata and Kenzo Nakayama. *Ibid.* 65–70.

XXVII. Degradation of the quality of whale oil in tank storage. Shunichi Okura and Mitsuo Nagata. *Ibid.* 71–4. (*C.A.* **51**, 15153)

The fatty-acid composition of livestock fat. Influence of grass feed. O. Dahl (Scans Centrallab, Malmo, Swed.). *Z. Lebensm.-Untersuch. u-Forsch.* **106**, 81–95 (1957). The fatty acid composition of cow and heifer kidney tallow is practically independent of the feed. The cow fat is richer in oleic and poorer in stearic acid than is heifer fat. Horse fat composition is considerably related to the feed. The horse fat contains considerable amounts of linolenic acid, the contents of which is considerably increased during green-feed regimes. (*C.A.* **52**, 604)

Changes of animal fat under industrial conditions. M. Nechaev (Meat and Dairy Technol. Inst., Moscow). *Myasnaya Ind. S.S.S.R.* **28** (4), 26–8 (1957). Oxidation of pork fat under industrial conditions (1 month frozen storage prior to rendering, rendering of fresh pork trims, sedimentation, centrifgual separation, drying, chilling, and canning or packaging) occurs in 2 stages: (1) inductive period, ranging from 5–6 to 10–12 days, depending upon the conditions of fat handling; (2) oxidation period leading to rancidity. Changes of peroxide number, acid number, iodine number, epihydrin aldehyde and epoxy oxygen are characteristic of the second oxidative stage. Under industrial fat processing only the first stage of the fat oxidation takes place which is characterized by changes of peroxide number and acid number, the change of acid number being more indicative of proper fat handling. (*C.A.* **52**, 603)

Emulsifiers in the manufacture of margarine. N. A. Petrov (All-Union Sci.-Research Inst. Fats, Moscow). *Masloboǐno-Zhirovaya Prom.* **23** (8), 1–6 (1957). The theory of emulsion formation, physical chemical properties of an emulsion, its effect on the interfacial tension between oil and water and the stability of an emulsion, as well as the spattering of margarine during frying as affected by various factors are discussed. (*C.A.* **52**, 603)

Transformation of beef fat into synthetic butter (bolzella). G. Guex. *Fleischwirtschaft* **8**, 494–5 (1957). Synthetic butter was made from beef fat. Physical characteristics of the synthetic butter were the same as for natural butter, and the transformation did not involve polymerization or interesterification. (*C.A.* **52**, 603)

Application of the "heat-test" used on lard to butter and margarine. K. Taüfel and R. Serzisko. *Ernährungsforschung* **2**, 121–6 (1957). Fresh and old samples of butter and margarine were heated up to the smoke point and the odor noted at 40, 60, 80–100, 100–120, 120–140, and 140–180°. Old samples of butter were characterized by a rancid odor, old samples of margarine by moldy odor, and old samples of both were most characterized by lowering of the smoke point. (*C.A.* **52**, 600)

Recent developments in the use of fatty-acid esters and ethers as emulsifying and surface-active agents in foods. C. M. Keyworth (Keyworth & Co. Ltd., Leek, Engl.). *Congr. mondial détergence et prods. tensio-actifs, 1^{er}, Paris,* **1954**, **3**, 1086–90 (1956). This review covers glyceryl derivatives, pentaerythritol esters, and polyoxyethylene esters. The toxicity hazards of the polyoxytheylene esters are considered. (*C.A.* **52**, 595)

Composition and some of the properties of the unsaponifiable residues obtained in the manufacture of synthetic fatty acids. A. N. Postol'nyĭ (Polytech. Inst., Kharkov). *Masloboǐno-Zhirovaya Prom.* **23** (8), 30–2 (1957). The composition of the unsaponifiable residue in 2 paraffin oxidation processes were respectively: paraffin about 60 and 40–53%, and the oxygen containing compounds, namely, alcohols and ketones, 40 and 60%. The wide variation between ester, iodine and hydroxyl numbers of the residue from batches of processed paraffin was attributed largely to the presence of substances which readily underwent keto-enol rearrangement during the oxidation process, and to the analytical procedures employed. (*C.A.* **52**, 756)

Production of powdered fats and study of their stability. N. Kozin and B. Khomutov. *Sovet. Torgovlya* **1955**, No. 1, 15–8. A method is described for production of powdered fats (butter and margarine) capable of long storage (especially at high temperature) by dehydrating in drying spray tower to a moisture content of 1–1.5%. The quantitative ratio of the components of the emulsion, having the necessary stability and guaranteeing the production of powdered fats, is as follows: fats 40.0, casein 3, sugar 2, water and salts (disodium phosphate 0.45, sodium chloride 0.2, and tri-sodium citrate 0.3). (*C.A.* **52**, 604)

The absorption of Sudan Red III in the medium of vegetable and mineral oils. V. Jančík (Vyzkumny ústav oleje tuky, Ustí nad Labem, Czech). *Chem. zvesti* **11**, 267–73 (1957). Refined vegetable oils and distilled methyl esters of the higher fatty acids of soybean oil inactivate active bleaching clay of the montmorillonite type even if the oils are prebleached. The bleaching clay has great adsorption capacity up to 100° in paraffin oils. It has reduced capacity in paraffin oils at 125–30° and is inactivated at 150–60°. The vegetable oil and methyl esters may be blocking the same absorptive sites in the clay which adsorbed Sudan Red III from benzene solution. These are not blocked by paraffin oil. (*C.A.* **51**, 18650)

Fatty acid constituents of mink oil. J. M. Cross and J. Ehrlich. *Drug and Allied Inds.* **43** (7), 10–1 (1957). The fat collected from the pelts of ranch-grown mink had the following fatty acid composition: myristic 4.8, palmitic 12.2, stearic 9.1, oleic 37.1, linoleic 12.3, hexadecenoic 22.2, and octatetraenoic 2.3%. (*C.A.* **52**, 757)

Fractionation of sperm head oil by the urea adduct method. Hiroshi Sakurai and Masao Fujiwara. *Mem. Inst. Sci. and Ind. Res., Osaka Univ.* **14**, 225–32 (1957). Sperm oil was separated by two heterogeneous-phase urea treatments into 3 parts; predominantly solid wax, liquid wax, and glycerides. The fractions were then further separated into saponifiable and unsaponifiable material. The glyceride part was found to contain no C_{10} fatty acids. Fatty acids with chains longer than C_{22} and considerable amounts of C_{18} and C_{20} unsaturated acids were found. The two wax parts contained large amounts of short chain fatty acids (i.e., C_{10} and C_{12}). (*C.A.* **52**, 757)

Kamala seed oil and kamlolenic acid. J. S. Aggarwal (Natl. Chem. Lab., India, Poona). *Oil and Soap (Egypt)* **2**, 277 (1955). Review with 25 references. (*C.A.* **52**, 757)

Chemical composition of sunflower-seed hulls. M. I. Lishkevich and G. S. Repina. *Masloboǐno-Zhirovaya Prom.* **23** (8), 9–12 (1957). The chemical composition of hulls from sunflower seeds A-41, and VNIIMK 6540 and 8931 of original and high-oil varieties is reviewed in some detail. The seeds were harvested at Krasnodar in 1955. (*C.A.* **52**, 757)

The effect of prepressing and decoction skimming of oil on the qualities of oil and final oil cake. N. P. Kovalenko (Oil-Fat Combine, Poltava). *Masloboǐno-Zhirovaya Prom.* **23** (8), 7–9 (1957). The effects of various factors (decoction, prepressing, etc.) on the quality of oil removed by each process and of oil cake were reviewed. (*C.A.* **52**, 757)

Dehydration of castor oil by phenol-substituted sulfonic acids and their potassium salts. V. A. Saraf and K. K. Dole (Fergusson Coll., Poona). *J. Indian Chem. Soc.* **34**, 383–6 (1957). *p*-Phenol-, *m*-cresol-, and resorcinolsulfonic acids and the potassium salts of *p*-phenol- and *m*-cresolsulfonic acids were found to be active catalysts for the dehydration of castor oil at 250°. Phosphoric acid was an effective catalyst at 280°, while ammonium acid phosphate and sodium acid phosphate were inactive even in amounts of 5%. (*C.A.* **52**, 757)

Dehydration of castor oil. V. A. Saraf and K. K. Dole (Fergusson Coll., Poona). *J. Indian Chem. Soc.* **34**, 381–3 (1957). 1-Anthraquinonesulfonic acid, 2-anthraquinonesulfonic acid, *p*-toluenethiosulfonic acid, metanilic acid, methyl benzenesulfonate, ethyl benzene sulfonate, and ethyl *p*-toluenesulfonate were studied as catalysts in the dehydration of castor oil. (*C.A.* **52**, 757)

Determination of the hydrocyanic acid content of flax seed and cake. É. André and M. Maille. *Compt. rend.* **244**, 2091-2 (1957). The hydrocyanic acid contents of the oil cake, oil, and seed of flax from different areas or countries were measured. In all instances the hydrocyanic acid content of the oil cake was less than that of the corresponding seed. (*C.A.* **52**, 756)

Effect of the degree of unsaturation of fatty alcohols on the properties of the sulfated products. I. Introduction and his-

torical review. Bahi El Din Gebril(Alexandria Univ.). *Oil and Soap(Egypt)* 4, 426(1957). 47 references.

Antioxidants and food preservation. H. Schmidt-Hebbel(Univ. Chile, Santiago). *Arch. venezolanos nutric.* 7, 131–43(1956). An account is given of the effect of constituent fats and oils on rancidity, with methods of controlling the latter. (*C. A.* **52**, 603)

Technochemical composition of the sperm whale blubber and its changes at rendering. V. V. Kolchev and Z. V. Marieva. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Morskogo Rybnogo Khoz. i Okeanograf.* **25**, 151–8(1953). The sperm whale blubber was studied. The greatest amount of moisture and solids and the least amount of fat were found in surface layer of the fat (20–5 mm.), and the major part of the fat in the middle layer. (*C.A.* **52**, 755)

Rendering whale fat in different types of boilers on the whale ship "Slava". K. A. Mrochkov. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Morskogo Rybnogo Khoz. i Okeanograf.* **25**, 126–40(1953). Fat rendering in kettles with open or closed rotors and in a "Gartman" kettle were studied. The maximum fat yield (75%) is obtained in kettles with closed rotors, while in open rotor and in Gartman kettles, only a 70% yield is achieved. (*C.A.* **52**, 755)

Process of release of fat from blubber of whale. A. N. Golovin. *Rybnoe Khoz.* **33**(6), 85–91(1957). The microscopic structure of blubber, effect of temperature and moisture on protein, tendency toward emulsion formation, etc., are discussed with regard to their influence on release of oil during the rendering of blubber. A comparison of wet, dry and vacuum rendering indicated that best results are obtained by vacuum rendering. The optimum conditions for best yield of oil are: 100°, grinding to 2 × 2 × 2 cm., raising temperature to 100° in 30 minutes and holding at 100° for 45 minutes, and evaporating 40–50% of moisture under vacuum. Under optimum conditions, the yield of oil was 87% of that contained in the original blubber. Residues are pressed to yield another 9–10% oil so that the total yield attained is 96–7% of the oil. (*C.A.* **52**, 755)

Certain characteristics of the alkaline neutralization of vegetable oils (fats). A. Smits(Sci. Res. Lab. Fat Ind., Moscow). *Masloboĭno-Zhirovaya Prom.* **23**(8), 18–24(1957). A review is given of modern theories concerning fatty acid film formation on alkaline surfaces, and of the refining of cottonseed oil. (*C.A.* **52**, 755)

The role of diffusion processes in the hydrogenation of fats. S. Yu. Elovich. *Masloboĭno-Zhirovaya Prom.* **23**(8), 14–8 (1957). A review of the factors involved in the hydrogenation process. (*C.A.* **52**, 755)

Solubility of hydrogen in fat. B. N. Tyutyunnikov and I. I. Novitskaya(Polytech. Inst., Kharkov). *Masloboĭno-Zhirovaya Prom.* **23**(8), 13–4(1957). A simple apparatus for the determination of solubility of hydrogen in various fats is described. The solubility of hydrogen in apricot, castor, flax and sunflower seed oils, petrolatum, beef tallow and hydrogenated sunflower seed were found to vary from 4.0 to 5.3 and from 6.3 to 8.6 ml. per 100 g. at 50 and 220°, respectively. (*C.A.* **52**, 755)

Sugar-cane wax. A. Cavalcanti de Figueiredo(Inst. Açucar e Alcool, Recife, Brazil). *Anais assoc. brasil. quim.* **13**, 75 9 (1954). When sugar-cane press cake was extracted with chloroform, carbon disulfide, benzene, and petroleum ether, the yields of wax were respectively, 12.6, 12.3, 13.5 and 9.5%. The wax had a melting point 72–6°, saponification number 30–33, iodine value 14–18, acid value 7–13, and unsaponifiables 56–62%. (*C.A.* **52**, 757)

Olive oils fluorometry. A. Arpino, G. Ricca and G. Jacini(Stazione Sperimentale per le Industrie degli Olii e dei Grassi, Milano, Italy). *Olii Minerali—Grassi E Saponi—Colori E Vernici* **34**, 475–479(1957). The authors report on further research in a study of fluorometry for the quantitative estimation of fluorescence in olive oils, on some secondary compounds such as peroxides, free fatty acids, chlorophyll, carotenes, etc. A discussion is given concerning how the fluorescence of olive oil depends on its origin, processing and the various fluorescent compounds present in the oil.

Oxidation as a decomposing phenomena during refining of edible fats and oils. A. Dangoumau and H. Debruyne(Laboratoire Municipal de Bordeaux, Bordeaux, France). *Rev. franc. corps gras* **4**, 600–7(1957). Nearly thirty graphs and ten tables sum up the results of oxidation of fats and oils during refining in which activated earths are used. It was found that three absorption bands show: a major one at 268 mμ and secondary peaks at 258 and 278 mμ, caused by oxygen bondings. All three peaks increase the absorption shown at 234 mμ. These changes have been correlated with various regions of France where the oils are produced.

The lipids of ram spermatozoa. J. A. Lovern, June Olney, E. F. Hartree, and T. Mann(Dept. Sci. & Ind. Res., Food Investigation Organization, Torry Res. Station, Aberdeen). *Biochem. J.*, **67**, 630–643(1957). Washed, freeze-dried ram spermatozoa were extracted with chloroform-methanol solvent and the crude extracts purified by washing with water and passing through a column of cellulose, the yield of total lipids being 7–9%. It was considered that the aldehydogenic lipids (possibly plasmalogens) are 55–60% of the sperm lipids. No lecithin was found; 8% cholesterol (free); hydrocarbons (2%); probably sphingomyelin about 5.5% and other lipids difficult to characterize, but perhaps including esters and glycerides.

Decrease in acetyl values during decoloration of castor oil by certain activated earths. M. Naudet and J. Perrot(ITERG). *Rev. franc. corps gras* **4**, 549-551(1957). The author discusses the decrease found in acetyl values during the decoloration of castor oil when certain activated earths are used. Based on the data obtained it is deemed unlikely that the decrease in acetyl values is due to conjugated unsaturation, organic sulfates, or formation of esters. The more probable reason is the ether oxygen formation between the carbon chains thereby decreasing the amount of hydroxy groups available for acetylation.

Evaluation of the thickness of fatty layers of organic origin upon metal surfaces. J. J. Trillat and B. Schreiber(Sorbonne, Paris). *Chimie & Industrie* **78**, 476–479(1957). The writers set forth a method based on the selective coloring of animal or vegetable fats by certain dyes. This very sensitive method allows a fast qualitative detection, as well as the location of very thin layers of fat. By colorimetry, it is possible to calculate the approximate thickness of such layers of fat on metal surfaces of any kind. The approximation is adequate in most industrial cases.

Determination of five- to seven-carbon saturates by gas chromatography. F. T. Eggertsen and S. Groennings(Shell Development Co., Emeryville, Calif.). *Anal. Chem.* **30**, 20(1958). A blend of 25 C_5 to C_7 saturates can be analyzed for all components (except 3-ethylpentane) by gas chromatography using three different types of columns. Results agree well with API cooperative testing of same sample by other means. Three-column analysis can be made in 12 to 16 hours of elapsed time.

Determination of unsaturation by near-infrared spectrophotometry. R. F. Goddu(Hercules Powder Co., Wilmington, Del.). *Anal. Chem.* **29**, 1790(1957). Isolated double bonds of several types may be readily detected and determined by use of near-infrared region of spectrum. Because of its speed and specificity, near-infrared method can replace bromination or hydrogenation in determning certain double bond types. Terminal methylene groups may be determined at 1.6 or 2.1 microns and *cis* double bonds at 2.14.

Microdiffusion of C_1 through C_5 organic acids. L. M. Marshall and F. T. Fox(Robert A. Taft Sanitary Engineering Center, Cincinnati 26, Ohio). *Anal. Chem.* **30**, 140(1958). Rate of escape of normal aliphatic acids (C_1 through C_5) varies directly as carbon chain length during microdiffusion from an aqueous medium. Isomers of butyric and valeric acids show different diffusion rates. Microdiffusion of formic, acetic and propionic acids from nonaqueous media reflects relative vapor pressures of pure solutes.

Chromatographic identification and determination of organic acids in water. H. F. Mueller, T. E. Larson and W. J. Lennarz (Illinois State Water Survey, Urbana, Ill.). *Anal. Chem.* **30**, 41 (1958). Many of the organic acids occurring in natural waters and sewage can be quantitatively separated by adsorption chromatography using a silicic acid column. Acids are eluted by varying concentrations of butyl alcohol in chloroform and titrated with 0.02*N* sodium hydroxide. Each acid has a characteristic peak effluent volume. Anionic synthetic detergents may be separated by same method.

Separation of polyunsaturated fatty acid methyl esters by gas chromatography. C. H. Orr and J. E. Callen(Miami Valley Labs., Procter and Gamble Co., Cincinnati, 31, Ohio) *J. Am. Chem. Soc.*, **80**, 249(1958). The complete separation of the methyl esters of the commonly known fatty acids including the polyunsaturated materials is described. Separation of palmitic, palmitoleic, stearic, oleic, linoleic, linolenic, arachidic, and erucic acids was achieved under the described conditions.

The crystallography and structure of some C_{19} Cyclopropane fatty acids. T. Brotherton and G. A. Jeffrey(Dept. of Chem., Univ. of Pittsburgh). *J. Am. Chem. Soc.* **79**, 5132–5137(1957). The unit cell dimensions and space groups have been determined for four synthetic fatty acids, *cis-* and *trans*-DL-9,10-methylene-octadecanoic and *cis-* and *trans*-DL-11,12-methylene-octadecanoic, and two natural products, lactobacillic acid and dihydrosterculic acid. The crystals of the two *cis* and two *trans* synthetic acids, respectively, are isomorphous for reasons apparent from the packing shape of the molecules. The crystal structure of the dihydrosterculic acid is identical with that of the *cis*-DL-9,10 synthetic acid. The lactobacillic acid crystal structure is different from that of any of the synthetic products. The crystal data in combination with chemical evidence point to the *cis*-D- or L-11,12-methylene-octadecanoic acid structure for lactobacillic acid. From powder diffraction data the acid amides are shown to have similar crystal structural relationships.

Spreadability and hardness of butter. I. Development of an instrument for measuring spreadability. V. R. Huebner and L. C. Thomsen(Dept. Dairy and Food Industries, Univ. of Wisconsin, Madison, Wis.). *J. of Dairy Sci.* **40**, 834–838(1957). An instrument was developed more sensitive than consumers in detecting differences in the spreadability of butter. The results agreed closely with those obtained from consumer-preference studies.

II. Some factors affecting spreadability and hardness. *Ibid.* 839–846(1957). Temperature of the cream after pasteurization and that of the butter during storage and the printing procedure had the greatest influence on hardness and spreadability of butter. Storing cream at above 48°F. after pasteurization, and butter below 25°F., improved the body of butter.

Acetin fats. III. The binary systems ASA-SAA and APA-PAA, mixed symmetrical and unsymmetrical stearoyl diacetins and palmitoyl diacetins. E. S. Lutton(Research and Development Dept., Procter and Gamble Co., Miami Valley Labs.). *J. Am. Chem. Soc.* **79**, 5137–38(1957). ASA (2-stearoyldiacetin) and APA (2-palmitoyldiacetin) occur in metastable subalpha and alpha forms and stable beta prime-like forms (alpha being questionable for the palmitic compound). Mixtures of the symmetrical and unsymmetrical isomers in the binary systems ASA-SAA and APA-PAA show greatly increased alpha stability over that of the pure compounds. Melting points of mixtures in the alpha form lie in a straight line joining those of the components. In the composition range 30–90% of unsymmetrical isomer, the alpha phase shows no transformation in 2 months, hence a high degree of stability is implied for this phase of a binary mix of saturated diacetins prepared via random interesterification (2/3 unsymmetrical).

X-Ray diffraction of molecular compounds of long-chain saturated fatty acids. II. Some further observations on the diffraction of molecular compounds of acetamide and long-chain saturated fatty acids. R. T. O'Connor, R. R. Mod, Mildred D. Murray, F. C. Magne and E. L. Skau(Southern Regional Research Lab.). *J. Am. Chem. Soc.* **79**, 1529–32(1937). Further examination of the X-ray diffraction patterns of molecular compounds of acetamide with myristic, palmitic and stearic acids has revealed the existence of two polymorphic forms. Three sets of long spacings have been identified: (a) a weak long spacing identical to that of the "C" form of the parent acid; (b) a shorter long spacing corresponding to a modification equal in length to one molecule of the "A" form of the saturated fatty acid and one molecule of acetamide; and (c) a longer long spacing corresponding in length to two molecules of the "C" form of the saturated fatty acid and two molecules of acetamide. Each of the polymorphic modifications of these three acetamide compounds has been shown to form an isomorphous series. The lauric acid addition compound is anomalous, exhibiting (other than the weak spacings identified as identical to those of the parent acid) only one set of spacings.

Ester interchange reactions of long chain thiol esters. G. S. Sasin, P. R. Schaeffer, and R. Sasin(Dept. of Chem., Drexel Institute of Technology). *J. Organic Chem.* **22**, 1183–1184 (1957). Ethanethiol esters of lauric, myristic, palmitic, and stearic acids undergo ester interchange reactions with alkanethiols, arylthiols, alcohols, and phenol in the presence of sodium methoxide or β-naphthalenesulfonic acid. Eight previously unreported thiol esters were prepared by ester interchange.

Preparation of cell-free yeast homogenate that converts acetate to sterols. G. J. Alexander(Worcester Foundation for Experimental Biology, Shrewsbury, Mass.). *Science* **126**, 1065 (1957). Cell-free yeast preparations have been applied recently to the study of sterol biogenesis. However, all three preparations require complicated apparatus for the mechanical disruption of yeast cells. A search for an easier method has been conducted in this laboratory over the last 2 years, and a method employing only the simplest equipment is described in this report.

Ascending paper chromatography: a way to do it. L. C. Mitchell(Div. of Food, Food & Drug Admin., Dept. Health, Educ. & Welfare, Washington 25, D. C.). *J. Assoc. Official Agr. Chemists* **40**, 999–1029(1957). The principles and techniques of ascending paper chromatography are discussed. A glossary of terms is included. Examples of practical applications include the analysis of antioxidant mixtures, phosphates, and DDT.

The determination of polyoxyethylene esters in bread and rolls. R. A. Garrison, V. Harwood and R. A. Chapman(Lab. of Food & Drug Directorate, Ottawa, Ontario, Canada). *J. Assoc. Official Agr. Chemists* **40**, 1085–93(1957). Details are described for two methods of estimating the polyoxyethylene monostearate content of bread products. One procedure depends on determination of alkoxy groups by reaction with HI. The other involves precipitation of the stearate with phosphomolybdate and colorimetric estimation of its concentration. Recovery of polyoxyethylene monostearate from dried bread was most complete when the sample was successively digested with warm 6*N* HCl, treated with KOH and K_2CO_3, and extracted with chloroform. Recovery was reproducible but not quantitative.

Outlook for U. S. soybean oil in Spain. J. de Arespacochaga y Felipe(Factorias Oleicolas Indus., Madrid, Spain). *Soybean Digest* **18**(2), 17–18(1957). Because domestic olive oil supplies are not sufficient, other vegetable oils are being used in increasing quantities in Spain. Importation of soybean oil so that olive oil may be exported is particularly desirable. The FOISA refinery is described briefly.

The soybean, miracle crop of the twentieth century. *Soybean Digest* **18**(3), 1A–16A(1958). Statistics for soybean oil vs. total fat consumption, soybean meal vs. total protein consumption, and the economic value of soybean crops and products are reviewed.

Preparation of organic acids by the caustic fusion of cyanohydrins. E. F. Riener(Rohm & Haas Co.). *U. S. 2,811,538.* Saturated aliphatic monocarboxylic and dicarboxylic acids are obtained by heating the cyanohydrins of C_{16} to C_{22} aliphatic acids or their esters in the presence of molten alkali at temperatures between 200° and 400°.

Novel hydrogenation process. C. M. Gooding(The Best Foods Inc.). *U. S. 2,814,633.* A process is described for the hydrogenation of soya oil to produce margarine without the formation of significant quantities of isomeric and conjugated polyunsaturated glycerides. The oil is hydrogenated under nonselective conditions at 230° to 250°F. until an iodine value of 105 to 115 is reached and then continuing the hydrogenation under selective conditions at 260° to 350°F. The product has excellent plasticity at normal refrigeration temperatures and does not become unduly soft at summer temperatures.

Method of making stable pourable oleaginous suspensions. G. W. Holman and J. H. Sanders(The Procter & Gamble Co.). *U. S. 2,815,285.* A method is described for the preparation of a pourable suspension of 1 to 20% by wt. of solid glycerides in a normally liquid glyceride vehicle. The mixture is heated to melt all of the solid glyceride, is cooled in not more than 3 minutes to a temperature below the *alpha* melting point of the solid glyceride, and finally is tempered so that at least 60% of the solid glycerides are converted to the stable *beta* phase.

Liquid shortening. J. R. Andre and L. H. Going(The Procter & Gamble Co.). *U. S. 2,815,286.* An opaque to translucent liquid shortening which is pourable at temperature as low as 60°F. is a stable suspension of 2 to 10% fully saturated glycerides in an oil. At least 80% of the saturated glycerides are in the form of *beta*-phase crystals, and contain both mono- and diglycerides of C_{16} to C_{22} fatty acids.

Process for extracting the coloring matter from annatto seeds. H. M. Barnett, Margaret B. Barnett and H. M. Espoy(Margaret B. Barnett). *U. S. 2,815,287.* Whole annatto seeds are soaked in water and then the pigments are extracted with a fatty oil.

Method of rendering fat. C. Pavia(Pavia Process Inc.). *U. S. 2,815,356.* A method is described for rendering fatty tissue particles having a moisture content above 15% by agitating and heating until fat has been rendered and moisture content is lowered to 2 to 15%. The mixture is filtered hot under pressure.

Sesame seed decorticator. G. Horvilleur(Palazio, Horvilleur & Co., Ltd.). *U. S. 2,815,783.* A process for decortication of sesame seeds with alkali is described.

Steroid production. J. A. Campbell, D. A. Shepherd, A. C. Ott and B. A. Johnson (The Upjohn Co.). *U. S. 2,816,119.* A process is described for the fractionation of stigmasterol and sitosterol mixtures as their carbamates.

Method of extracting the content of vegetal cells through mechanical means. L. M. Romagnan. *U. S. 2,817,591.* Aromatic oils, essential oils and fats are obtained by grinding the tissue in water and separating the dispersion of oils and fats from residual cellular matter.

Process of flavoring margarine. J. Boldingh and R. J. Taylor (Lever Bros. Co.). *U. S. 2,819,169.* Margarine is given a butter-like flavor by the addition of at least one compound having a C_4 to C_6 lactone ring which is not condensed to a hydrocarbon ring.

Food product. H. Gunthardt (General Foods Corp.). *U. S. 2,819,971.* Amorphous gelatin particles are coated with lecithin.

Method of coating freshly cut surfaces of meat. L. Letney (The Rath Packing Co.). *U. S. 2,819,975.* A porous protective coating of fat is deposited on a freshly cut surface of meat at temperatures below 40°F. The process consists in spraying molten fat through a cooling zone so that congealed droplets form and deposit individually on the meat.

Insect repellent sticks. Helen E. Wassell (Union Carbide Corp.). *U. S. 2,819,995.* An insect repellent stick is prepared from the repellent, palmitic and stearic acids, and ozokerite wax.

Pretreatment of oilseed meats. W. H. King (U. S. A., Secy. Agr.). *U. S. 2,820,047.* Prior to extraction of oil, oilseed meats are mixed with a 1 to 10% aqueous solution of sodium hydroxide and a water-miscible organic solvent such as methanol or 2-propanol. Oilseed particles separated after this treatment have a moisture content of 4 to 12%.

Apparatus for fractional distillation. Appareils & évaporateurs Kestner. *Fr. 1,023,218.* Decomposition, polymerization, or changes in molecular structure caused by superheating in high-vacuum distillation are eliminated by heating the substance to be distilled in a device consisting of a vertical cylinder filled with the heating fluid through which a vertical bundle of tubes passes. The liquid to be distilled is fed into these tubes in such a manner that a thin film flows downward on the tube walls and the vapor leaves at their lower end. A series of such heaters can be distributed at different levels of the distilling column; this decreases the heating temperatures of the residue. This method is especially recommended for the distillation of saturated and unsaturated fatty acids and C_{14}–C_{22} alcohols. (*C. A.* 52, 12)

Purification of ricinoleic acid esters. Compagnie de produits chimiques et electrometallurgiques Alais, Froges & Camargue. *Fr. 1,023,247.* Methyl esters obtained by esterification of the total acids of castor oil or by alcoholysis of castor oil are distributed between a hydrocarbon and an alcohol. Methyl ricinoleate concentrates in the alcohol phase and esters of hydroxyl free fatty acids in the hydrocarbon phase. A light gasoline (boiling point 60–80°) and 95% methanol were used in the examples. Methyl ricinoleate of 99% purity was obtained. (*C. A.* 52, 761)

FATTY ACID DERIVATIVES

Potentiometric determination of amides in acetic anhydride. D. C. Wimer (Abbott Laboratories, North Chicago, Illinois). *Anal. Chem.* 30, 77 (1958). The titration of amides in acetic anhydride is rapid, reproducible, and more convenient for routine analyses than previously reported amide procedures. Perchloric acid in acetic acid, or dioxane, is used as titrant. End points of titration curves are readily detected with a modified calomel-glass electrode couple.

Determination of higher aliphatic aldehydes in presence of ketones and fatty acids. L. D. Metcalfe and A. A. Schmitz (Armour and Co., Chicago, Ill.). *Anal. Chem.* 29, 1676 (1957). Higher aliphatic aldehydes in presence of fatty acids and ketones are determined by oxidation to fatty acids in an aqueous system of standard alkali and 3% hydrogen peroxide at elevated temperatures. Standard alkali consumed is a measure of aldehyde. Aldehydes above C_{12} require 5% hydrogen peroxide and a longer reaction period.

Phosphorus derivatives of fatty acids. III. Trialkyl α-phosphonates. B. Ackerman, Rose Marie Chladek and D. Swern (Eastern Regional Research Lab.). *J. Am. Chem. Soc.* 79, 6524–26 (1957). Triethyl α-phosphonates have been prepared in 60–96% yield from triethyl phosphite and the ethyl ester of the appropriate C_4–C_{18} straight chain α-bromocarboxylic acid. Mixed trialkyl α-phosphonates have been similarly prepared in 30–90% yield from the appropriate trialkyl phosphite and alkyl ester of the α-bromocarboxylic acid. The α-phosphonates are colorless, odorless, thermally stable liquids, insoluble in water and soluble in organic solvents. In contrast to the isomeric diethyl acyloxyethylphosphonates previously reported, the triethyl α-phosphonates are resistant to hydrolysis with 0.1*N* hydrochloric acid, but they are converted to the tribasic α-phosphonocarboxylic acids when refluxed for 18–24 hr. with 20–35% hydrochloric acid. With dilute base in ethanol, the carboxylic ester group is preferentially hydrolyzed yielding α-diethylphosphonocarboxylic acids.

Studies on glyceryl esters. I. The formation of urea inclusion compounds with 1-monoglycerides. F. Aylward and P. D. S. Wood (Dept. Chem. & Food Technol., Borough Polytechnic, London, S.E. 1). *J. Applied Chem.* 7, 583–9 (1957). Urea formed crystalline inclusion compounds with monostearin, monopalmitin, monomyristin, monolaurin, monocaprin and monocaprylin, but not with monobutyrin or monopropionin. Each adduct was purified by controlled recrystallization from methanol. Physical appearance, solubility and dissociation temperature are described. Analyses are reported. The molecular ratio of urea to lipide in the adduct rose with the molecular weight of the monoglyceride in a linear fashion. There was also a linear relationship between the dissociation or exudation temperature of the adduct and the number of carbon atoms in the monoglyceride.

Stabilized pentaerythritol ester compositions. L. Mehr and G. H. Dick (Shell Dev. Co.). *U. S. 2,815,327.* A pentaerythritol tetraester of a saturated C_5 to C_7 fatty acid is stabilized against oxidative or thermal increases in viscosity and acidity by the addition of small amounts of both a diarylamine and a thiodiarylamine.

Reaction products of fatty amines and reducing disaccharides. J. G. Erickson (General Mills, Inc.). *U. S. 2,815,339.* A ketose-fatty amine reaction product containing at least 2 fatty amino groups is prepared by reacting a C_5 to C_7 ketose sugar with a C_{12} to C_{18} fatty amine at a temperature between 40 and 100°.

Reaction products of fatty amines and reducing disaccarides. J. G. Erickson (General Mills, Inc.). *U. S. 2,815,340.* A reducing disaccharide is reacted with a C_8 to C_{22} primary fatty amine at 50 to 80° for 2 to 5 hours.

Dispersible fatty amines. T. H. Lentz, J. W. Opie and D. E. Terry (General Mills, Inc.). *U. S. 2,816,870.* From 80 to 90% of a C_{14} to C_{22} fatty amine is dispersed in a low molecular weight ether alcohol (ROC_2H_4OH) with a cationic or non-ionic dispersant.

Purification of long chain fatty acids. E. L. Skau (U. S. A., Secy. Agr.). *U. S. 2,816,903.* A long chain fatty acid is purified by crystallization of its acetamide complex.

Process for the preparation of acylated derivatives of N-substituted lactamides. M. L. Fein, E. H. Harris and E. M. Filachione (U. S. A., Secy. Agr.). *U. S. 2,817,672.* The desired lactamide is obtained by heating a mixture containing lactic acid, a saturated C_2 to C_{12} fatty acid, and an amine such as dibutylamine, 2-hydroxyethylamine, 2-hydroxypropylamine and bis-(hydroxyethyl) amine with concurrent removal of water.

Reaction product of epoxidized glycerides and hydroxylated tertiary monoamines. M. DeGroote and Jen-Pu Cheng (Petrolite Corp.). *U. S. 2,819,278.* A hydroxylated tertiary amine is reacted with an epoxidized glyceride containing about one oxirane ring per fatty acid radical. The reaction involves rupture of the oxirane ring and is limited to the –C–O–C– linkage.

Addition products of conjugated fatty acids and acetylene carboxylic acid. H. M. Teeter and M. J. Danzig (Secy. Agr., U. S. A.). *U. S. 2,819,299.* An adduct is prepared from acetylene carboxylic acid and 9,11-octadecadienoic acid.

Polyolefinic alcohols of increased conjugation from soybean and menhaden oils. E. B. Ayres (Ethyl Corp.). *U. S. 2,819,317.* Mixtures of polyolefinic alcohols corresponding in chain length and degree of unsaturation with the fatty acid radicals of the glycerides are prepared by reduction of the oil. At least 35% conjugation of the olefinic groups occurs simultaneously.

Alcohols derived from babassu oil. E. F. Hill (Ethyl Corp.). *U. S. 2,819,318.* A mixture of alcohols is prepared from babassu oil. The mixture has an average molecular weight greater than 160, a per cent hydroxyl of at least 6.0 and an iodine number of at least 8.0. The alcohols correspond in number of carbon atoms, degree of unsaturation and distribution to the fatty acid radicals of the oil.

Ester lubricants. J. Hartley, T. H. Ramsay and J. D. Shimmin (Shell Development Co.). *U. S. 2,820,014.* The lubricant consists essentially of a mixture of liquid diesters. One is a diester of a branched chain C_4 to C_{18} alkane primary diol with a straight chain C_4 to C_{18} fatty acid. The other is a diester of a straight chain C_3 to C_{12} alkane di-primary diol with a branched chain saturated C_4 to C_{18} fatty acid.

Oxidation of fatty acids. J. S. Mackenzie and C. S. Morgan, Jr.(Celanese Corp. of America). *U. S. 2,820,046.* Mono- and dicarboxylic acids are obtained by the reaction of oxygen with a propanol solution of a C_{10} to C_{14} unsaturated fatty acid at a temperature between 25° and 150°. Specifically, azelaic and pelargonic acid are prepared by the oxidation of oleic acid in the presence of a small amount of 9,10-dihydroxystearic acid.

• Biology and Nutrition

Distribution of cholesterol and phospholipides in rat serum lipoprotein fractions separated by paper electrophoresis. M. Miettinen. *Ann. Med. Exptls. et Biol. Fenniae(Helsinki)* **35**, 168–72(1957). In rat serum, 60–70% of the cholesterol and phospholipides are bound to alpha$_1$-lipoprotein. About 21% of them are present in the alpha$_2$-fraction and 14% in the beta-fraction. In healthy persons about 28% of cholesterol and 49% of phospholipides are bound to alpha$_1$-fraction. In rabbit serum about 34% of cholesterol and 50% of phospholipides are bound to alpha$_1$-fraction. In humans and rabbits 2–8% of cholesterol and phospholipides are bound to alpha$_2$-fraction. (*C. A.* **52**, 528)

Serum lipides and lipoproteins in old age. E. A. Nikkilä and T. Niemi(Univ. Helsinki). *Scand. J. Clin. & Lab. Invest.* **9**, 109–15(1957). Older women had significantly higher serum lipide levels than men in the same age group. Serum lipide values in females rise with increasing age to the 80th year. In men, the rising trend ceases at 65. The distribution of serum lipide in lipoproteins is identical in both sexes and any changes are reflected in both the alpha- and beta-lipoproteins. The causes of these changes and the relation to atherosclerosis are discussed. (*C. A.* **52**, 526)

Distribution of cholesterol and phospholipides in rabbit serum lipoprotein fractions separated by electrophoresis. M. Miettinen. *Ann. Med. Exptls. et Biol. Fenniae(Helsinki)* **35**, 165–7 (1957). In the blood serum of the white rabbit, about 34% of the cholesterol and 50% of the phospholipide is bound to the alpha-lipoprotein fraction. (*C. A.* **52**, 470)

Lipoxidase oxidation of pork fat. L. A. Bushkova and I. P. Larionova. *Sbornik Moskov. Tekhnol. Inst. Myasnoi i Molochnoi Prom.* **1955**, No. 3, 69–72. A method for determination of the lipoxidase activity of muscle extracts is described. The kinetics of the effect of the lipoxidase on oleic acid and lard are elucidated. (*C. A.* **52**, 603)

Effect of physical activity on cholesterol atherosclerosis in rabbits. S. D. Kobernick, G. Niwayama and A. C. Zuchlewski (Wayne State Univ. Col. of Med.). *Proc. Soc. Exptl. Biol. & Med.* **96**, 623–628(1957). Thirty-six New Zealand white rabbits of 5 litters and one group of miscellaneous rabbits were fed 28 g. of cholesterol for 60 days. Half of the animals were exercised for 10 min. a day; half the animals remained sedentary. There was a significant diminution of atherosclerosis in the exercised animals as determined by visual grading and by chemical analysis of the lipid content of the aorta.

Non-transfer of trans fatty acids from mother to young. Patricia V. Johnston, O. C. Johnson, and F. Kummerow(Univ. Ill., Urbana, Ill.). *Proc. Soc. Exptl. Biol. & Med.* **96**, 760–2 (1957). Less than 0.5% of *trans* fatty acids were found in fat extracted from young born to mother rats which contained between 23.5 and 26.8% *trans* fatty acids in their carcass fats. The amount of *trans* fatty acids in the carcass fats of the young was markedly increased when they were allowed to suckle the maternal milk for 9 days.

Toxicity of autooxidized squalene and linoleic acid, and of simpler peroxides, in relation to toxicity of radiation. V. J. Horgan, J. St. L. Philpot, Barbara W. Porter and D. B. Roodyn (Radiobiological Res. Unit, A.E.R.E., Harwell, Didcot, Berks). *Biochem. J.* **67**, 551–58(1957). An anaerobic reagent is described, consisting of leuco-brilliant cresyl blue in butanol buffered with lutidine and lutidine acetate, with and without lithium cuprobromide. This shows two types of reaction with various organic peroxides, according to the effect of the cuprobromide, with further differentiation according to kinetics. Injected peroxides kill more quickly than radiation. The evidence is consistent with the view that radiation toxicity is due to initiation of chain autooxidation of essential fatty acids producing lethal doses of peroxides in sites not reached by vitamin E. The LD_{50} of autooxidized linoleic acid (0.26 μ-mole of peroxide/g.) compared to the mean increase of peroxide previously found in mice after 950 r. of X-ray (0.22 μ-mole/g.).

Effects of dietary fat upon plasma polyunsaturated acids. R. T. Holman, H. Hayes, H. Malmros and G. Wigand(Hormel Inst., Austin, Minn.). *Proc. Soc. Exptl. Biol. & Med.* **96**, 705–9(1957). If the increase in trienoic acids may be taken as chemical evidence of EFA deficiency, the results of this preliminary investigation suggest that prolonged ingestion of high levels of saturated fat may lead to a relative deficiency of essential fatty acids.

Heated oils, factors involved in nutrition? A. Dangoumau, F. Berlureau, and H. Debruyne. *Rev. franc. corps gras* **4**, 541–545 (1957). The authors discussed the effect of heating oils from the viewpoint of possible changes in nutritive factors of the edible oils. Perhaps the major change is in oxidation of some of the oil to form various types of peroxides or oxides. It is believed that polyunsaturated conjugated compounds are among the more important products produced by heating oils in the presence of oxygen.

Cholesterol and phospholipide concentration in hepatic lymph and bile during phosphatide induced hypercholeseremia. S. O. Byers and M. Friedman(Harold Brunn Inst., Mount Zion Hosp., San Francisco, Calif.). *Proc. Soc. Exptl. & Med.* **96**, 702–5(1957). Rate of disappearance of intravenously injected phosphatide from plasma was markedly retarded in the liverless rat. When hypercholestermia was provoked in normal rats by constant infusion of phosphatide, the elevated blood cholesterol concentration was not reflected in any rise of cholesterol level in hepatic or intestinal lymph, or in bile. The elevated phospholipide level was not reflected in bile or intestinal lymph, but did cause a moderate rise in the phospholipide level of hepatic lymph.

Skin sterols XIII. Incorporation of acetate into various sterols by skin slices. S. C. Brooks and C. A. Baumann(Dept. Biochem., College of Ag., Univ. of Wis., Madison, Wis.). *J. Bio. Chem.* **229**, 329–336(1957). Skin slices from rats and mice were incubated with $CH_3C^{14}OONa$, and the sterols separated into Δ^5 and Δ^7 fractions. The specific activity of the Δ^7-cholestenol fraction from rat skin was 3 to 4 times that of the "cholesterol" fraction, whereas the specific activity of the Δ^7-sterol fraction from mouse skin was about 25 times that of the Δ^5 fraction. Unesterified Δ^7 sterols, although present in very small amounts, had the highest specific activity. Skin cholesterol purified via the dibromide showed only 50% of the radioactivity of the crude Δ^5-sterol fraction; this result indicates the presence of high counting companions in this fraction. Liver incubated in a similar manner yielded a Δ^7 fraction with a high specific activity and a Δ^5 fraction which contained high counting companions in addition to cholesterol.

A column chromatographic separation of classes of phospholipides. D. J. Hanahan, J. C. Dittmer and Emily Warashina (Department of Biochemistry, University of Washington, Seattle, Washington). *J. Biol. Chem.*, **228**, 685–700(1957). The chromatography of the mixed phospholipides from rat liver, beef liver, and yeast on a single silicic acid column is described. Through the use of various mixtures (v/v) of chloroform-methanol, namely 4:1, 3:2, and 1:4, a satisfactory separation of the phospholipides into five different fractions is possible. A phosphatidylethanolamine, phosphatidylserine fraction, the phosphoinositides, and lecithins comprise the major fraction of the lipides, although sphingolipides and an unidentified low nitrogen-containing phospholipide are present to a small extent. From 90 to 95 per cent of the inositol-containing phospholipides are eluted in a single fraction and thus introduce an improved procedure for the isolation of phosphoinositides.

Properties of the toxic factor in trichloroethylene-extracted soybean oil meal. T. A. Seto, M. O. Schultze, Victor Perman, F. W. Bates and J. H. Sautter(Institute of Agriculture, University of Minnesota, St. Paul 1, Minn.). *J. Agr. and Food Chem.* **6**, 49–53(1958). A bioassay with calves served as a guide in studies of the properties of the toxic factor in trichloroethylene-extracted soybean oil meal, which produces fatal aplastic anemia in cattle. The toxic factor is an organic compound, which is associated with the protein fraction of the soybean oil meal from which it can be liberated by pancreatic digestion in small water-soluble, dialyzable fragments. As it occurs in soybean oil meal, the toxic factor at 65° to 70° is stable at pH 1.5, but unstable at pH 12.0. No criterion, other than biological effects, has been found by which the toxic factor could be detected.

The component fatty acids of neurospora crassa lipides. D. Todd, D. Stone, O. Hechter, and A. Nussbaum(Worcester Foundation of Experimental Biology, Shrewsbury, Mass.). *J. Biol. Chem.* 229, 527–533(1957). The composition of *Neurospora crassa* lipide fatty acids is reported. The data were obtained by paper chromatography of the radioactive fatty acids isolated after the microorganism was raised in the presence of acetate-1-C^{14}. A technique for determining the composition of the mixture of acids running in any one zone in the above paper system is described.

Occurrence of plasmalogens in lipides of green peas. A. C. Wagenknecht(New York State Agricultural Exp. Station, Cornell University, Geneva, New York). *Science* 126, 1288(1957). The pea phosphatides (acetone insoluble lipides) were fractionated with glacial acetic acid and with 95% ethanol. The plasmalogen content of the phosphatide fractions (expressed as milligrams per gram of lipide) was as follows: alcohol soluble (lecithin), 3.9; alcohol insoluble (cephalin), 7.3; acetic acid insoluble (phosphatidyl inositol), 29.4.

Isolation and synthesis of a new sterol from rat feces. W. W. Wells and D. H. Neiderhiser(Biochem. Dept., Univ. of Pittsburgh, School of Medicine, Pittsburgh, Penn.). *J. Am. Chem. Soc.* 79, 6569(1957). Isolation and synthesis of a previously reported new sterol from rat feces, is described. It is suggested that the sterol arises in the intestinal mucosa and that it may be an intermediate in the biosynthesis of cholesterol.

Phospholipides containing amino acids other than serine. J. Westley, J. J. Wren, and H. K. Mitche(Kerckhoff Labs. of Biology, Calif. Institute of Tech., Pasadena, Calif.). *J. Bio. Chem.* 229, 131–136(1957). Evidence is presented which demonstrates the existence, in a variety of tissues, of amino acid derivatives of lipides. Amino acids found include several which do not contain hydroxyl groups. Among these are alanine, leucine, aspartic acid, glutamic acid, and cystine. Methods are presented that permit a clear distinction between bound amino acids and those rendered soluble by phospholipides. Paper electrophoresis is particularly satisfactory for this purpose. The substances under consideration appear to be peptide derivatives of phospholipides. γ-Aminobutyric acid and δ-aminovaleric acid have been identified as normal constituents in the fungus *Eremothecium ashbyii*, and the corresponding lactams appear as contaminants in phospholipide preparations obtained from it.

Cholesterol and companions. X. The diol fraction. L. F. Fieser, Wei-yuan Huang and B. K. Bhattacharyya(Chemical Lab., Harvard Univ.). *J. Organic Chem.* 22, 1380-1384 (1957). A technique of inverse chromatography facilitated isolation from various cholesterol samples of 25-hydroxycholesterol, cerebrostenediol (24-OH isomer), 7-ketocholesterol, and an alkane-1,2-diol mixture. 25-Hydroxycholesterol appears not to be a product of animal origin but to result from air-oxidation of crystalline cholesterol. Oxidation of cholesterol with a variety of reagents has afforded no less than twenty oxidation products in which the original 27 carbon atoms are retained.

Relative effectiveness of various antioxidants fed to lactating dairy cows, on incidence of copper-induced oxidized milk flavor and on apparent carotene and tocopherol utilization. A. P. De Luca, R. Teichman, J. E. Rousseau, Jr., M. E. Morgan, H. D. Eaton, Patricia MacLeod, Martha W. Dicks, and R. E. Johnson(Animal Industries Department, Connecticut Agricultural Experiment Station, Storrs). *J. Dairy Sci.* 40, 877–886(1957). Twenty-four cows were selected for producing milk which developed the oxidized flavor 72 hr. after adding five p.p.m. of copper. They were fed rations containing either no antioxidant, N, N′-diphenyl-para-phenylenediamine (DPPD), 2,6-di-tertiarybutyl-4-methyl phenol (BHT), 1,2-dihydro-2,2,4-trimethyl-6-ethoxyquinoline (Santoquin), D-α-tocopheryl acetate (Myvamix), or 2-methyl-1,4-naphtoquinone (Menadione). DPPD was the most effective antioxidant and inhibited the copper-induced flavor against five p.p.m. of copper in milk; whereas, Myvamix and Menadione gave only partial protection against one p.p.m. of copper.

Vitamin E deficiency in the monkey. J. S. Dinning and P. L. Day(Dept. of Biochem., School of Medicine, Univ. of Arkansas, Little Rock, Ark.). *J. Nutrition* 63, 393–397 (1957). The concentrations of tissue nucleic acids and muscle creatine were determined on vitamin E-deficient, normal, and recovered monkeys. Vitamin E deficiency resulted in an elevated concentration of skeletal muscle desoxyribonucleic acid (DNA) and an elevated concentration of bone marrow DNA and ribonucleic acid (RNA). The bone marrow RNA/DNA ratio was elevated in vitamin E-deficient monkeys. All these changes were reversed with tocopherol therapy. Skeletal muscle creatine was reduced in vitamin E-deficient monkeys and only partially restored toward normal in recovered animals.

The effect of various fats upon experimental hypercholesteremia in the rat. D. M. Hegsted, Anna Gotsis and F. J. Stare (Dept. of Nutrition, Harvard School of Public Health, Boston, Mass.). *J, Nutrition* 63, 377–391(1957). A large number of oils and combinations of oils were tested for their effects upon the serum cholesterol values in an assay based upon the cholesterol-cholic acid-fed rat. It appears that the oils may act upon this experimental system in a manner somewhat similar to those reported on the serum cholesterol values of human subjects. The data show that the product obtained by multiplying the essential fatty acid content (linoleic and arachidonic acid) by the total saturated fatty acid content has a high degree of negative correlation with the serum cholesterol values produced. Thus, it is concluded that the "non-essential" unsaturated fatty acids (oleic, linolenic, eleostearic and perhaps clupadonic) promote hypercholesteremia while this action is counteracted by the essential and saturated fatty acids. Insofar as we have been able to test the hypothesis, the essential fatty acids and the saturated fatty acids are equally active in this regard and substitute for each other.

The fat-globule membrane of normal cow's milk. I. The isolation and characteristics of two membrane-protein fractions. C. T. Herald and J. R. Brunner(Department of Dairy, Michigan Agricultural Experiment Station, East Lansing). *J. Dairy Sci.* 40, 948–955(1957). Cold 35% ethanol-in-ether was used to break the fat globule lipoprotein complex. The protein(s) recovered consisted of a soluble and an insoluble fraction of about equal distribution, based on their solubility in 0.02 *M* sodium chloride. The soluble fraction contained 11.10% N, 0.7% S, 0.46% P, 7.06% ash; was Molisch-positive, reduced Fehlings solution, and was nitroprusside-negative after heating to 75°. The insoluble fraction contained 13.8% N, 0.94% S, 0.23% P, 2.08% ash, and was Molisch-negative and nitroprusside-positive after heating to 75°. Alkaline phosphatase was concentrated in the soluble, and xanthine oxidase in the insoluble, fraction. The insoluble fraction was tentatively classified as pseudokeratin.

Role of butterfat in nutrition and in atherosclerosis: A review. F. A. Kummerow(Department of Food Technology, University of Illinois, Urbana). *J. Dairy Sci.* 40, 1350–1359(1957). The role of butterfat in nutrition and in atherosclerosis is discussed in the light of its chemical and nutritional properties, its importance in health, and the transitory evidence for the dietary linkage of fat with heart disease. The triglyceride and fatty acid composition of butterfat is structurally different from other edible fats. This difference contributes to the superior nutritional value of thermally oxidized butterfat. It is emphasized that the total caloric intake and the ratio of dietary protein to dietary fat may be more important in determining serum cholesterol levels than the intake of the so-called soft and hard fats.

Some sources of variation in total plasma cholesterol levels in dairy cattle. H. D. Lennon, Jr., and J. P. Mixner(N. J. Agr. Experiment Station, Sussex, New Jersey). *J. Dairy Sci.* 40, 1424–1429(1957). Variations in plasma cholesterol levels among animals of varying physiological states and ages were investigated. Effects due to variation among animals were 97.07% of the total variance, while short-term variation in blood sampling was only 2.79%. Plasma cholesterol levels in 11 cows at parturition were significantly lower than either prepartum or postpartum levels. Age, pregnancy, and lactation also affected cholesterol levels.

Solubility of carbon dioxide in body fat. G. Nichols, Jr.(Dept. of Biochem. and Medicine, Harvard Univ. Medical School Boston, Mass.). *Science* 126, 1244(1957). These data indicate that, in an obese individual, a significant portion of the total body CO_2 may be in solution in the fat depots. This fact may be of considerable importance in the calculation of gas exchanges in short-term studies of respiratory function.

Effect of diphenyl-p-phenylenediamine on the utilization of carotene and vitamin A by the calf. F. Pirchner, R. S. Allen and N. L. Jacobson(Depts. of Animal Husbandry and Chem., Iowa State College, Ames, Iowa). *J. Dairy Sci.* 40, 1448–1456 (1957). The toxicity of diphenyl-*p*-phenylenediamine (DPPD) and its effect on the absorption of vitamin A and carotene from the gut of the dairy calf was investigated. Growth was depressed when DPPD was first fed, but thereafter it had little effect on the health of calves as indicated by weight, blood cell counts, hemoglobin levels, and general appearance. High levels of DPPD (3 to 10 g/100 lb. of body weight) impaired vitamin A absorption, whereas lower levels (250 p.p.m.) improved absorption of this vitamin and of carotene.

Effect of feeding stabilized feed tallow on milk production and composition. J. W. Stull, F. G. Harland and R. N. Davis

(Dept. of Dairy Science, University of Arizona, Tucson). *J. Dairy Sci.* 40, 1233–1241(1957). Rendered beef tallow was fed to lactating cows and its effect on blood serum lipides, milk composition, and production was studied. Blood serum lipide was increased by feeding a concentrate mixture containing 7% beef tallow. Animals on the high-fat ration produced more milk than those on the control ration.

Effect of exercise on blood coagulation time and atherosclerosis of cholesterol-fed cockerels. Nelta H. Warnock, T. B. Clarkson and R. Stevenson(Dept. of Biology, East Tennessee State College, Johnson City, Tenn.). *Circulation Research* 5, 478–80 (1957). Evidence is presented that exercise arrests the progress of atherogenesis in cholesterol-fed cockerels. Blood coagulation times are significantly lengthened and body weight gains increased by exercising cholesterol-fed cockerels. Vascular and hepatic cholesterol concentrations were significantly smaller in exercised birds than in nonexercised controls. Biochemical data are presented indicating a greater susceptibility of the brachiocephalic arteries to atherosclerosis than the other arteries examined.

Determination of free and total gossypol in mixed feed containing cottonseed meals. W. A. Pons, Jr. and C. L. Hoffpauir (S. Regional Research Lab., New Orleans, La.). *J. Assoc. Official Agr. Chemists* 40, 1068–80(1957). In the analysis of mixed feeds containing cottonseed meals, free gossypol is extracted with a mixed isopropyl alcohol-hexane-water mixture containing 3-amino-1-propanol which prevents interference by other feed constituents and stabilizes gossypol during the extraction. The same complexing agent dissolved in dimethylformamide is utilized for rapid extraction of total gossypol. Gossypol contents of the extracts are estimated colorimetrically after reaction with aniline. Both free and total gossypol contents of typical mixed feeds were found to change slowly during storage of the feed in glass jars at room temperature. Changes occurring after pure gossypol was added to feed suggest that most of the loss of free gossypol during storage results from a binding with feed constituents with resultant loss of extractability. Some destruction by oxidation also occurs.

Mycological formation of fat. IV. The component fatty acids of the fat produced by Penicillium soppii Zal. J. Singh, Mrs. S. E. Philip and T. K. Walker(Manchester College of Science & Technol., Manchester 1). *J. Sci. Food Agr.* 8, 697–701 (1957). *Penicillium soppii* was grown in surface culture on a medium containing sucrose and mineral salts. Fat was isolated and analyzed by low temperature fractional crystallization of the fatty acids and distillation of the methyl esters. The fat had a low free fatty acid content (0.6% as oleic acid). Component acids were found to be: myristic, 0.3; palmitic, 22.0; stearic, 7.6; arachidic, 0.9; hexadecenoic, 3.3; oleic, 45.2; linoleic, 20.0; linolenic, 0.3; and eicosenoic, 0.4. These values are compared with those of fats produced by other types of microorganisms.

Soybean oil meal in livestock and poultry feeds. I. A World Traveler's Viewpoint. J. W. Hayward(Archer-Daniels-Midland Co.). *Soybean Digest* 18(3), 14–16(1958). The production of soybean oil meal and other protein concentrates, and the value of soybean oil meal for poultry feeds are reviewed briefly.

II. A researcher's viewpoint. L. E. Hanson(Univ. of Minnesota). *Ibid.* 17–19. The great increase in soybean oil meal production, particularly during the past 15 years, and its value as a protein feed of high biological value for livestock are discussed briefly. Typical feeding experiments with pigs are reviewed.

Therapeutic compositions. W. J. Hale(Verdurin Co.). *U. S. 2,815,314.* The active ingredients in the mixture include a water soluble form of chlorophyll, carotenoids, vitamins E and K, and rhodizonic acid.

Nutritional aid. R. H. Gross. *U. S. 2,816,854.* A nutritional aid to increase the immunity of warm blooded animals to non-specific diseases of the digestive tract is prepared from an astringent substance and at least 20,000 U.S.P. units of vitamin A per feeding.

Stable injectable fat emulsions. J. Kalish(Schenley Labs., Inc.). *U. S. 2,819,199.* A stable, non-toxic, assimilable and injectable fat emulsion is prepared from 30 to 55% by wt. of fat, 5 to 10% of an assimilable monosaccharide, and a pair of emulsifiers. Preferred emulsifier combinations include (a) glyceryl monostearate and polyoxyethylene sorbitan monostearate, (b) the condensation product of ethylene oxide and polypropylene glycol and polyglycerol oleate, (c) the condensation product of ethylene oxide and polypropylene glycol and polyoxyethylene sorbitan monostearate, (d) polyethylene glycol monostearate and polyoxyethylene sorbitan monostearate, and (e) polyethylene glycol monostearate and the condensation product of ethylene oxide and polypropylene glycol. The average size of the particles in the emulsion is smaller than 2 microns. The emulsion is sterile and free from pyrogenic substances.

• Drying Oils and Paints

Use of fractionated tall oil fatty acids in isophthalic alkyd resins. E. F. Carlston(Calif. Res. Corp., Richmond). *Am. Paint J.* 42(1), 50–60(1957). Compared with phthalic acid, isophthalic acid alkyd resins show greater reactivity and thermal stability, less sublimation loss, faster drying, and more durable surface coatings. Compared with soybean fatty acids, tall oil fatty acids of low rosin content when used in alkyd vehicles have less drying capacity because of the absence of linolenic acid and lower amount of linoleic acid, although excellent drying properties are obtainable. (*C. A.* 52, 748)

Chromatographic identification of fatty acids produced in the analysis of lacquers. U. Lichthardt(Inst. Lacquer and Material Testing, Dr. Boller, Giessen, Ger.). *Farbe u. Lack* 63, 387–93(1957). Extensive tests showed the usefulness of paper chromatography for identification of the fatty acids obtained in lacquer analysis. A reversed phase technique was used. The paper was treated with glacial acetic acid saturated with undecane for 14–16 hours, whereupon the dried strips were immersed in an aqueous cuprous acetate solution. The copper salts formed were made visible with potassium ferrocyanide. Patterns of various saturated and unsaturated higher fatty acids and their mixtures are produced. (*C. A.* 52, 748)

Formation of hydroperoxides during the drying of oils and its effect upon the polymerization. W. Strubell(Forschungslab, VEB Dentalchem., Leipzig, Ger.). *Plaste u. Kautschuk* 4(3), 117(1957). To prove that hydroperoxides are formed during "drying" of oils, a mixture of methyl methacrylate, copper-propionylacetone and aerated linseed oil was kept at 40°. After 4 hours, η 1.7 was reached. Similar mixture without linseed oil had η 0.8. (*C. A.* 52, 748)

Fish oils in the paint industry. J. Huesa. *Grasas y Aceites* 8, 226–229(1957). The theoretical principles of the process for drying oils are given.

Detection of oiticica oil in coatings. G. G. Esposito and M. H. Swann(Coating and Chemical Laboratory, Aberdeen Proving Ground, Md.). *Anal. Chem.* 29, 1861(1957). Oiticica oil can be detected in coating materials by the red color developed with *m*-dinitrobenzene. The *m*-dinitrobenzene reacts with the characteristic carbonyl group of licanic acid, principal acid constituent of the oil.

Infrared analysis of emulsion polishes. J. E. Murphy and W. C. Schwemer(S. C. Johnson and Son, Inc., Racine, Wis.). *Anal. Chem.* 30, 116(1958). A rapid method for qualitative determination of wax, resin, polymer and emulsifier in emulsion polishes is made possible by techniques of infrared spectroscopy. Spectra of common components of emulsion polishes and of a group of amine emulsifiers as their hydrochloride derivatives are presented. Complete and definitive analyses can be obtained by separating product into its components.

Linoleum cement. A. K. Forsythe(Armstrong Cork Co.). *U. S. 2,815,295.* A linoleum cement is prepared by oxidizing with air a mixture of tall oil fatty acids esterified with a C_3 to C_5 polyhydric alcohol and rosin. The mixture has a rosin acid number of 35 to 48.

Baking enamels from alkyd resins and polymethylol derivatives of substituted guanamines. S. H. Rider, T. Anas and G. L. Fraser(Monsanto Chemical Co.). *U. S. 2,816,865.* An alcohol-free baking enamel is prepared from an alkyd resin having an oil length of 30 to 60% and an acid number of less than 15, a di-, tri- or tetramethylol derivative of an aryl or aralkyl guanamine, and an aromatic hydrocarbon solvent mixture.

Resinous composition comprising acid adducts and certain aminoplast resins dissolved in glycols. A. F. Schmutzler(American Cyanamid Co.). *U. S. 2,816,874.* The mixture contains the reaction product of an α,β-unsaturated carboxylic acid with (a) an ethylenic unsaturated C_{12} to C_{20} fatty acid or (b) unsaturated fatty acid pitch, a formaldehyde condensation product of dicyandiamide, aminobiguanide or guanylurea, and a solvent such as ethylene glycol, diethylene glycol, propylene glycol and dipropylene glycol.

Paint compositions. S. J. Buckman (Buckman Labs., Inc.). *U. S. 2,818,344.* A paint is prepared from barium borate, a pigment, and a vehicle such as film-forming drying oils, oil varnishes, or oil-modified alkyd resins.

Dextran and drying oil fatty acids-modified polyesters. E. P. Wenzelberger (The Commonwealth Engineering Co.). *U. S. 2,818,396.* The following materials are mixed: 30 to 65% by wt. of unsaturated polycarboxylic acids or anhydrides, 15 to 50% of a polyhydric alcohol, 5 to 20% of dextran, and 5 to 20% of a drying oil polyunsaturated fatty acid. The mixture is heated at a temperature between 50° and 300° until a fluid resinous product is obtained.

Copolymers of aryl olefins and alpha beta ethylenically unsaturated carboxylic acid esters of oxidized tall oil esters. L. H. Dunlop and R. H. Reiff (Armstrong Cork Co.). *U. S. 2,819,234.* An oxidized polyhydric alcohol ester of tall oil having a viscosity of 450 to 1500 seconds Gardner-Holdt at 25° is esterified with an α,β-unsaturated carboxylic acid. The resulting ester is copolymerized with a vinyl aromatic compound containing a single vinyl group at temperatures between 60° and 150°.

• Detergents

Separation of nonionic surface-active agents from mixtures with anionics by batch ion exchange. M. J. Rosen (Brooklyn College, Brooklyn, N. Y.). *Anal. Chem.* **29**, 1675–6 (1957). Nonionic surface-active agents can be separated from mixtures with anionics by a batch ion exchange method in which a solution of the surfactant mixture is stirred with a relatively small amount of a strong anionic exchange resin. The anionic material is adsorbed firmly by the resin, and is removed together with it by filtration; it is then washed free of nonionic material with methanol. The nonionic material is recovered in substantially quantitative yield from the filtrate and washings. Results with 14 binary nonionic-cationic mixtures are discussed.

Improving soap with nonionics. H. E. Tschakert (Chem. Werke Huels A. G.). *Seifen-Oele-Fette Wachse* **83**, 610–12, 651–4 (1957). The addition of certain nonionics to soap improves texture and homogeneity, reduces the tendency to crack and flake, increases brilliance and foaming properties, especially in cold water. Fragance retention is improved. The soap becomes more economical and more efficient in hard water use owing to the lime dispersing power of the syndets. The high detergency of fatty alcohol oxethylates and fatty amine polyoxethylates adds further to the washing power of such formulated soaps. The latter appear to be the most effective against rancidity in soap. The presence of ethylene oxide condensates in soap facilitates incorporation of other additives such as complexing agents, antioxidants, CMC, superfatting agents, germicides and deodorants.

Germicidal detergent compositions containing ''tamed'' iodine. Anon. *Am. Perfumer* **70**(6), 37–8 (1957). Iodine may be solubilized with nonionic detergents to form a sanitizer useful in shampoos and ointments having many applications.

New resins for detergent bars. Anon. *Soap & Chem. Specialties* **33**(12), 269–70 (1957). A new class of high molecular weight water soluble resins has been introduced by Union Carbide Chemicals for use in detergents, soaps and cosmetics. These ''Polyox'' resins are made by a new process which permits the coupling of as many as 100,000 ethylene oxide molecular units. They are suggested for incorporation in synthetic detergent bars and shampoos in which they are said to improve creaminess of lather, lubricity, and feel. Concentrations of two per cent by weight of the bar are recommended. They should be suitable for formulating with detergents and extruding as a film for use as a completely soluble non-residual soap or detergent leaf or sheet.

Surfactant-iodine complexes as germicides. P. G. Bartlett and W. Schmidt. *Appl. Microbiol.* **5**, 355–9 (1957). In the preparation of nonionic surfactant-iodine complexes, part of the iodine is lost due to iodination of the surfactant and formation of an acid (believed HI). The amount of iodine lost in the reaction is dependent on the surfactant used. While the major part of the iodine remains free and titratable, its properties have been modified by the surfactant, that is, increased stability in dilute aqueous solutions, elimination of staining, and reduction of skin and eye irritation; thereby increasing its applications in the field of sanitation. The combination of surfactant and iodine provides efficient antimicrobial action against a wide variety of test organisms using test methods of primary importance for evaluating disinfectants, sanitizers, and detergent-sanitizers.

Analysis of alkylbenzene sulfonates. E. W. Blank (Colgate-Palmolive Co., Jersey City, N. J.). *Soap & Chem. Specialties* **35**(1), 41–4, 107 (1958). A detailed scheme of analysis is presented for alkylbenzene sulfonates. It includes determination of alcohol soluble material, determination by cationic titration, determination of neutral oil, and determination of water.

Fundamentals of spray-drying detergents. J. H. Chaloud, J. B. Martin and J. S. Baker (Procter & Gamble Co., Cincinnati, Ohio). *Chem. Eng. Progress* **53**, 593–6 (1957). A logical study and the application of basic principles to the existing information on spray drying are presented. The variables in the operation are discussed.

The effectiveness of different alkylolamides as foam stabilizers. K. R. Dutton and W. B. Reinisch (Dutton & Reinisch Ltd., London, Engl.). *Soap, Perfumery, Cosmetics* **31**, 44–50 (1958). Two test methods for measuring foam which attempt to duplicate actual washing conditions are described. In the first, the foam once produced is submitted to further agitation as is the case in actual washing. In the second test, the foam is produced by passing a stream of air through a glass bubbler into the detergent solutions and the foam thus formed is then impinged upon a web of nylon thread. The tests were performed using commercially available sodium dodecyl benzene sulfonate, and monoethanolamides prepared from commercial coconut oil and purified lauric acid and were carried out in the presence of sodium tripolyphosphate. The foam stabilizers prepared from pure lauric acid were much more effective than those of coconut oil.

Spray dried perfumes. R. T. Maleeny (Dodge & Olcott, Inc., New York). *Soap & Chem. Specialties* **35**(1), 135, 137, 139, 141, 145 (1958). Perfuming of powdered soaps and synthetic detergent may be simplified and made more effective by a new method of producing spray dried, non-volatile perfumes in powder form. Spray drying in a mixed flow dryer featuring centrifugal atomization is the preferred method for the manufacture of such sealed-in perfumes. They have indefinite shelf life, are easy to handle, economical and representative of the liquid perfume used in their manufacture.

Corrosion of aluminum by alkaline sequestering solutions. H. W. McCune (Procter & Gamble Co., Cincinnati, Ohio). *Ind. Eng. Chem.* **50**, 67–70 (1958). Alkaline solutions of the sequestering agents sodium pyrophosphate, triphosphate, and ethylenedinitrilotetraacetate corrode aluminum more rapidly than nonsequestering solutions at the same pH, although above a pH of about 10 the effect of the sequestering agents becomes increasingly less important. Hydroxide is used up in alkaline corrosion, while in alkaline sequestering corrosion within a certain range of pH values there is a net increase in hydroxide from the reaction of the sequestrant with hydroxoaluminum species to form soluble aluminum complexes. Effects on corrosion by triphosphate of time, concentration, pH, buffers, temperature, volume, and complexable cations are described.

The new sugar esters. L. Osipow and F. D. Snell (Foster D. Snell, Inc., New York, N. Y.). *Intern. Sugar J.* **59**, 38–9 (1957). A discussion of the properties and uses of the nonionic sugar-ester surfactants. (*C. A.* **51**, 15158)

New germicide for soap. D. P. Roman, E. H. Barnett and R. J. Balski (Monsanto Chem. Co., St. Louis, Mo.). *Soap & Chem. Specialties* **35**(1), 35–6, 107 (1958). The antimicrobial activity of 3,4,4′-trichlorocarbanilide has been demonstrated to be high both *in vitro* and *in vivo* by accepted test procedures. Activity against gram positive cocci is in the range of 1:30 million. Skin degerming activity of 2 per cent TCC is better than that of equal amounts of bithionol or hexachlorophene. The color stability of TCC enables it to be incorporated into skin care products with no discoloration. TCC's almost complete lack of toxicity furnishes ready assurance of safety when used in topically applied preparations.

Determination of oxyalkylene groups in glycols and glycol and polyglycol ethers and esters. S. Siggia, A. C. Starke, Jr., J. J. Garis, Jr., and C. R. Stahl (General Aniline & Film Corp., Easton, Pa.). *Anal. Chem.* **30**, 115–6 (1958). A procedure has been developed for determining the oxyalkylene groups in glycols, and in glycol or polyglycol ethers and esters. The procedure involves the use of hydriodic acid to react with the oxyalkylene group, thus forming one mole of 1,2-diiodoalkane for each group. These diiodo compounds are unstable and split off a mole of iodine to form the corresponding alkylene. The iodine liberated in the reaction is titrated with standard thiosulfate.