TABLE III

Rate of Hydrolysis[a] of Sulfonated Esters at 100°

	Acid Hydrolysis in N/3 H_2SO_4, k_1[b]	Alkaline Hydrolysis, k_2[c]
Disodium 1-methyl-2-sulfoethyl α-sulfostearate	....	0.13
Sodium methyl α-sulfopalmitate	0.0047	0.14
Disodium 2-sulfoethyl α-sulfopalmitate	0.0051	1.0
Sodium 2-sulfoethyl oleate[d]	Too rapid to measure accurately	4.3

[a] Rate constants shown are averages of 3 to 4 measurements made in the concentration range where x is 0 to 0.05.

[b] k_1 = first order rate constant = 1/t 1n a/a–x, in reciprocal minutes.

[c] k_2 = second order rate constant = $\frac{1}{t}\,\frac{x}{a(a-x)}$, in liters · moles^{-1} · minutes^{-1}.

[d] Isolated active ingredient from a commercial product.

stable to hydrolysis. The hydrolysis of sodium 2-sulfoethyl oleate was too rapid for accurate measurement under these conditions.

The rate of alkaline hydrolysis was measured by heating 0.01 mole of the ester in 100 ml. of 0.1 N sodium hydroxide at 100° and titrating 10 ml. samples at selected intervals. Alkaline hydrolysis was found to correspond to a second order reaction. Disodium 1-methyl-2-sulfoethyl α-sulfostearate, an ester of a secondary alcohol, was about as stable to hydrolysis as the simple methyl ester, which in turn was seven times as stable as disodium 2-sulfoethyl α-sulfopalmitate. The least stable ester, sodium 2-sulfoethyl oleate, was hydrolyzed about four times as fast as disodium 2-sulfoethyl α-sulfopalmitate. The isethionate esters of α-sulfo acids are therefore considerably more stable to hydrolysis, in acid and alkaline solutions, than isethionate esters of fat acids.

Summary

Disodium 2-sulfoethyl α-sulfopalmitate, disodium 2-sulfoethyl α-sulfostearate, and disodium 2-sulfoethyl α-sulfobehenate were prepared by esterification of the corresponding α-sulfonated acid with sodium isethionate. Disodium 1-methyl-2-sulfoethyl α-sulfostearate was made from sodium 2-hydroxypropanesulfonate. The esters were found to be readily soluble surface-active agents and detergents, very responsive to building with inorganic phosphates and sulfates.

Compared to sodium 2-sulfoethyl oleate the esters were readily prepared without the necessity of making the acid chloride; they were considerably more resistant to acid or alkaline hydrolysis; they were about equal in their excellent lime soap dispersing power, but inferior in foaming properties, producing a less permanent foam.

The esters were easily soluble because of the presence of two sulfo groups and were improved detergents in the presence of inorganic builders. Mixtures of the palmitic and stearic acid derivatives, such as might be obtained from the saturated acids of tallow, containing a total of 20% active ingredient, were effective detergents in hard water.

Disodium 1-methyl-2-sulfoethyl α-sulfostearate, an ester of a secondary alcohol, was even more resistant to alkaline hydrolysis than the esters from sodium isethionate.

Acknowledgment

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ABSTRACTS . . . . R. A. Reiners, Editor

• Oils and Fats

Ralph W. Planck, Abstractor
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Formation and structure of butter manufactured by Meleshin process. A. Zheltakov. *Molochnaya Prom.* **15**(6), 23–5(1954). The factors responsible for the emulsion reversal in Meleshin-made butter from fat-in-water to water-in-fat and the resulting structure of butter are discussed. (*C. A.* **49**, 529)

Spectrophotometric study of rancidity in oils. J. P. Wolff. *Parfumerie mod.* **46**, 53–61(1954). Spectrophotometry can be used to examine those oils whose rancidity causes formation of conjugated double bonds. This study is a review of such work done on linoleates, oleates, and olive, peanut, and almond oil. (*C. A.* **49**, 5004)

Production of high-quality melted butter (butter oil). F. Smorodin(Milk Combine, Kiev). *Molochnaya Prom.* **15**(6), 38(1954). A high-quality butter oil was produced by melting 2–3 kg. chunks of butter in 1000 l. of water at 50–60°, heating the oil to 90°, skimming the foam on the surface, lowering the oil temperature to 50°, and subsequently reheating to 75–80°. The clear oil is put in barrels at 65° and stored at 10–13°. (*C. A.* **49**, 529)

Neutralization of fats over aqueous salt solution. A. Smits. *Masloboĭno-Zhirovaya Prom.* **19**(8), 12–16(1954). S. discusses kinetics of disintegration of the emulsion formed between the layer of fat and aqueous settlings during alkali refining, the effect of concentration of free alkali and salt in the aqueous solution, and the temperature on settling of the refining solution. (*C. A.* **49**, 5003)

Determination of summary tocopherols (vitamin E) in plant products. B. G. Savinov and G. M. Lushchevskaya. *Ukrain. Khim Zhur.* **18**, 540–6(1952). A method based on the reaction of 2,2′-dipyridyl with $FeCl_3$ is described. (*C. A.* **48**, 5257)

Dehydration of castor oil and bodying of dehydrated oil. M. A. Sivasamban, S. A. Saletore, and S. H. Zaheer(Central Labs., Sci. Ind. Research, Hyderabad). *J. Sci. Ind. Research*(India) **13B**, 349–52(1954). In dehydrating castor oil, the optimum procedure involves preheating to 180° at 4–6 mm. Hg., adding 2% $NaHSO_4$ and 0.4% $NaHSO_3$, and heating to 220°. The vacuum is maintained throughout the operation, and efficient mechanical stirring is required to produce a light-colored oil. Immediately after dehydration, 2% $Ca(OH)_2$ or 1.3% ZnO is added to the oil. Bodied dehydrated castor oil is best prepared after the ZnO treatment, by heating 15–20 hrs. at 240–60° and 4–6 mm. Hg. (*C. A.* **49**, 645)

Effect of shortening consistency and added antioxidants on the keeping quality of biscuits. M. R. Sahasrabudhe, D. S. Bhatia, and V. Subrahmanyan (Central Food Technol. Research Inst., Mysore). *J. Sci. Ind. Research* (India) **13B**, 521–4 (1954). The keeping quality of biscuits can be improved by keeping down the free-oil content, by using a shortening of higher m.p., and by adding antioxidants.

Possible presence of vitamin E in olive oil. Tests with adult paired rats by feeding with a tocopherol-free diet. D. Ruccia (Univ. Bari, Italy). *Boll. soc. ital. biol. sper.* **29**, 1601–4 (1953). Low fertility of rats receiving olive oil was demonstrated.

Experiments with rats on a tocopherol-deficient diet paired with rats on a complete diet. *Ibid.* 1604–7. Olive oil contains essentially no vitamin E. (*C. A.* **48**, 5315)

Physiological suitability of ethyl gallate as an antioxidant. I. Acute toxicity dose. B. R. Roy (Univ. Coll. Sci. Technol., Calcutta). *Indian J. Medical Research* **41**, 201–5 (1953). The median lethal dose (fatal to 50% of the animals) of Et gallate was found to be 581.2 mg./100 g. body weight, administered orally to albino rats weighing 100–200 g. The high L.D.$_{50}$ value indicated that the small amounts used as an antioxidant are well within the margin of safety.

II. Determination of chronic toxicity. *Ibid.* 207–11. Growth reproduction, and lactation were studied in albino rats receiving a diet containing 1% Et gallate in oil, 100 times the dose necessary for antioxidant action. Results of growth studies begun at time of weaning and continuing for 9 weeks showed no statistical difference between rats receiving Et gallate and the controls. Comparable fertility was observed on both diets. Mean size and weight of litters at birth and lactation performance were unaffected by the presence of Et lactate in the diet. (*C. A.* **49**, 4874)

Removal of toxic alkaloids from argemone oil and oils adulterated with argemone oil. A. C. Roy (Provincial Ind. Research Lab., Patna). *J. Sci. Ind. Research* (India) **13B**, 376–7 (1954). Argemone oil was mixed with 1% MnO_2, aerated, and 1–5% H_3PO_4 was added in small amounts until a test sample gave negative tests for alkaloids. The treated oil was filtered, the excess H_3PO_4 neutralized with precipitated chalk, and the oil further refined with active C and fuller's earth. Adultered oils containing up to 20% argemone oil could be refined with only 0.5% MnO_2 and 0.5–1% H_3PO_4. (*C. A.* **49**, 645)

Separation of fatty acids of different molecular weight by means of addition of compounds with urea. Rolando Rigamonti and Virginio Riccio. *Ann. chim.* (Rome) **44**, 288–98 (1954). Treating solutions of mixed fatty acids in light benzene with solid urea in a saturated water solution yields addition products whose equilibrium constant of the reaction differs with the molecular weight of the acids. By using this complexing technique in a manner similar to fractional crystallization, fatty acids of 90% purity can be isolated. (*C.A.* **49**, 5003)

Cold-storage of butter. 1948-1952. E. Rahmn. *Svenska Mejeritidn.* **45**, 559–62, 564–6 (1953). A pH of 6.4–7.1 gave the best keeping qualities to cold-stored "special-salted" butter. (*C. A.* **48**, 5389)

Solvent extraction of oil cakes (peanut) by alcohol. Y. K. Raghunatha Rao (Central Food Technol. Research Inst., Mysore). *J. Sci. Ind. Research* (India) **12A**, 373–9 (1953). Alcohol extraction of oil from peanut cake at elevated temperatures is studied. Solubility of alcohol in peanut oil diminishes with free fatty acid content of the oil. Properties of extracted oil, steam, water and power requirements; capitol investment; and operating conditions are given for a commercial-sized plant. (*C. A.* **48**, 11087)

Miscibility of vegetable oils and alcohol. Y. K. Raghunatha Rao (Central Food Technol. Research Inst., Mysore). *Bull. Central Food Technol. Research Inst.* (Mysore) **3**, 221–4 (1954). R. presents miscibility curves plotted from temperatures of complete miscibility and cloud temperatures, obtained on heating and cooling, resp., of 30-g. portions of refined cottonseed, pressed peanut, and cold-pressed mustard oils to which increments of alcohol were successively added. (*C. A.* **49**, 5005)

A comparison of the peroxide numbers of butters preserved at different temperatures. E. Piraux, P. Jamotte, F. Lheureux, and R. Lacrosse. *Bull. inst. agron. et stas. recherches Gembloux* **22**, 76–89 (1954). This study attempts to find in the development of peroxide an index of the keeping qualities of butters. The changes in the peroxide no. of more than 200 butters were determined during storage at 1–2° and at —10°. These changes appeared to predict the life in storage. (Hills-Thiel, *C. A.* **41**, 3878). When the peroxide no. remained below 0.8–1.0 during 70–75 days, the butter did not become fishy or tallowy during 5–6 months at —10°. (*C. A.* **49**, 528)

Selection of solvents. II. A new method. Gerson Pereira Pinto (Inst. agron. norte, Belém, Brazil). *Bol. téc. inst. agron. norte* (Belém, Brazil) No. 26, 43–59 (1953). Application has been made of physicochemical methods in deriving a hyperbolic equation which is used in finding the most suitable solvents for processing oil-bearing seeds and cakes. Some new data are given on the extraction of murúmurú. (*C. A.* **48**, 11087)

Enzyme splitting of fats. Hasan Nizamuddin and B. S. Kulkarni (Osmania Univ., Hyderabad). *J. Sci. Ind. Research* (India) **12B**, 390 (1953). The lipolytic enzyme activity of several species of castor beans was investigated on non-drying, semi-drying, and drying oils. Semi-drying and drying oils were more easily hydrolyzed than non-drying oils (*C. A.* **48**, 5523–4)

Infrared spectra of castor oil. K. Ananth Narayan and B. S. Kulkarni (Osmania Univ., Hyderabad-DN). *J. Indian Chem. Soc., Ind. & News Ed.* **17**, 87–9. Infrared absorption spectra of castor oil show strong absorption in the 2.9-μ region, which is considered characteristic of the OH group. Absorption curves for castor-oil solutions (in $CHCl_3$) indicate the possibility of application of Beer's law to the band at 2.9 μ. Several new bands in the region of 7 to 11 μ have become visible as a result of dilution. (*C. A.* **49**, 5005)

Advanced design spurs oil yield. R. R. Mickus (Rice Growers Assoc. of Calif., Sacramento, Calif.). *Food Eng.* **27**(3), 80–3, 191 (1955). Hexane is percolated through rice bran in batch-type extractors operating on a 6-hr. cycle. Oil, solvent, and defatted bran are recovered.

Polarographic investigation of hydrogenation processes. I. A. L. Markman (Mid-Asiatic Polytech. Inst., Tashkent). *Zhur. Obshcheĭ Khim.* **23**, 1622–8 (1953). Experiments with maleic-fumaric and with oleic-fumaric acid mixtures demonstrate the suitability of polarographic analysis for the investigation of the progress and degree of selectivity of hydrogenation mixtures. (*C. A.* **48**, 4944)

Development of aroma in butter starter. A. Maksimova. *Molochnaya Prom.* **15**(8), 30–2 (1954). The experimental observations have shown that the production and retention of diacetyl and acetoin aroma-bearing compounds in a butter starter are influenced not only by joint action of lactic acid and of diacetyl- and acetoin-producing strains of *streptococci*, but also by rH (log of the reciprocal of the pressure of the H gas in equilibrium with the system) of the medium and the reducing power of the bacterial cells. (*C. A.* **49**, 4899)

Simultaneous hydrogenation-dehydrogenation experiments with soy oil fatty acid ethyl esters, ethanol, and Raney nickel. Aarne Mahnala (Inst. Tech., Helsinki). *Suomen Kemistilehti* **26B**, 57–66 (1953). The K_p of the reaction, oleic acid + EtOH → stearic acid + AcH, was calculated from known ΔH_o, ΔS_o, and and C_p for EtOH, AcH, oleic acid, and stearic acid. The results were: 6.3×10^{12}, 2.0×10^{9}, 3.0×10^{8}, and 6.6×10^{7} at 25°, 150°, 200°, and 250°, resp. The fatty acid ethyl esters were hydrogenated with Raney-nickel catalyst and by introducing the alcohol slowly in a vapor state at temperatures ranging from 140 to 250° at a slight positive pressure. The speed of hydrogenation was greater at the higher temperatures, but decomposition of the AcH was greater also and led to early poisoning of the catalyst by CO. No acid having greater unsaturation than oleic acid was found in the product. The optimum temperature range was 180–200°. (*C. A.* **48**, 11087)

Factors affecting the Gerber weighing method of testing cream. J. Lyons and M. J. O'Shea (Univ. Coll., Cork, Ireland). *Eire Dept. Agr. J.* **49**, 56-81 (1952–3). A major source of error in the Gerber method is the use of too high a concentration of H_2SO_4, which acts on the fat to produce Am_2O. The d. of the acid-H_2O-serum mixture should not exceed 1.54. Heating the samples to temperatures above 160°F. for more than 10 min. gives increased fat readings even when the acid used is of normal strength, favoring the formation of Am_2O and increasing the amount of AmOH dissolving in the fat. Prolonged shaking of the samples gives a slight decrease in the fat reading. The use of a standard cream butyrometer and a standardized method of testing is desirable. (*C. A.* **48**, 10949)

L-glutamic acid content of some oilseed cakes. V. S. Krishnamachar and B. V. Ramachandran (Natl. Chem. Lab. India, Poona). *J. Sci. Ind. Research* (India) **13B**, 222–3 (1954). An enzyme from a strain of *Clostridium welchii*-SR12 specifically decarboxylates glutamic acid. The CO_2 liberated gives a measure of glutamic acid content. Based on availability, peanut cake appears to be the most suitable for the manufacture of L-glutamic acid of all the oil cakes examined. (*C. A.* **48**, 11087)

Melting-point comparisons between cacao butter and edible fats. J. Kleinert (Lab. Lindt. & Sprungli A.-G., Klichberg-Zurich, Switzerland). *Rev. intern. chocolat.* **9**, 329–43 (1954) (English summary); *Zucker- u. Süsswarenwirtsch.* **7**, 711–15, 772–80, 821–3 (1954) (in English). The need for a clear definition of the term "m.p." is pointed out. Three methods for the m.-p. determination are described, *i.e.*, the methods of Fincke, of A.O.A.C., and of Whymper. Comparative m.-p. determinations by use of the 3 methods were made on cacao butter, m. 32–4°, coconut oil hardened by fractionation, m. 29–30°, refined coconut oil, m. 22–4°, shortening m. 34–6°, and hydrogenated peanut oil, m. 36–8°. The influence of different procedures of cooling on the m.p. was examined. The most reliable results were obtained by Fincke's method, but this process was unsatisfactory for soft fats with indeterminate m.p. Data obtained by the A.O.A.C. and by Whymper's methods were too low. The m.p. of cacao butter was depressed when the material was previously cooled abruptly in ice water, but this effect was no longer recognizable after 24-hr. storage. (*C.A.* **49**, 4904)

Natural fats. XI. The restricted random distribution rule and glyceride structure of the more natural fats. A. R. S. Kartha (Maharaja's Coll., Ernakulam). *J. Sci. Ind. Research* (India) **13A**, 471–81 (1954). Methods of calculating glyceride structure of natural fats (vegetable and animal) from the amount of saturated glyceride (GS_3) and composition of the total acid according to the "restricted random rule" are described. According to this rule the glyceride structures of all natural fats are calculated in the same manner irrespective of biological source or fatty-acid composition. The proportions of the different glyceride types in a series of natural fats determined by the azelaoglyceride analysis methods agree closely with those calculated according to the above mentioned rule. The proportions of different individual glycerides determined by the crystallization in a series of natural fats containing higher than 40% saturated acids show good agreement with those calculated according to the present method. (*C. A.* **49**, 5001)

Dry melting of whale fat. M. A. Kamyshan (Margarine Factory, Ivanovo). *Masloboĭno-Zhirovaya Prom.* **19**(8), 34 (1954). Barrels of solid whale fat are continuously pushed through a water-filled trough which is maintained at 70° for melting the fat. (*C. A.* **49**, 5003)

Antioxidants in fats and oils. I. O. Högl and F. Wenger (Eidg. Gesundheitsamt, Berne, Switzerland). *Mitt. Lebensm. Hyg.* **45**, 335–63 (1954). A review. The mechanism of autoxidation, methods for the determination of the stability of fats and oils, and the action of antioxidants are discussed. A list and the calculated safety margins of the antioxidants permitted in various countries is presented.

II. III. F. Wenger. *Ibid.* 364–88. The Swift stability test is described, and a model analysis with lard and peanut oil is given. A reaction temperature of 115° instead of 97.7° with an O_2 rate of 2.33 cc./sec. is recommended. The following 3 reactions for the detection and identification of the most commonly used antioxidants are discussed: (1) the reaction of gallates, guiacum, and nordihydroguaiaretic acid with ferrithiocyanate, (2) the reaction of butylhydroxyanisol with 2,6-dichloroquinone chlorimide, and (3) the reaction of gallates with NH_3. (*C. A.* **49**, 5002)

Preparation of fatty alcohols by catalytic hydrogenation under high pressure. R. J. Haefeli (DeRoll S. A., Zurich). *Chimia* (Switzerland) **7**, 255–8 (1953). The catalyst is prepared by dissolving equimolar amounts of Cr and Cu as CrO_3, chromate, or dichromate, and $Cu(NO_3)_2$ or $CuSO_4$, adding dilute NH_4OH, at constant temperature to give a brown precipitate corresponding to $Cu(OH)NH_4CrO_4$, washing, drying, grinding, and calcining at 300–500°. The brick-red hygroscopic product corresponds to the formula $2CuO \cdot Cr_2O_3$. A good catalyst should have a dull appearance and a blue-black color. The reduction of fatty acids is very slow below 280° at H pressures between 240 and 260 atmospheres. Above 320° paraffins are formed. (*C. A.* **48**, 5525)

Detection of vegetable fats and oils by the phytosterol acetate test. H. Hadorn and Jungkunz (Lab. VSK, Basel, Switzerland). *Mitt. Lebensm. Hyg.* **45**, 389–96 (1954). A modification of the phytosterol test is described. The material to be tested is saponified, and the unsaponified material is isolated with Et ether. The sterols are precipitated with digitonin to yield crystalline sterol acetates. A m.p. of sterol acetates above 117° indicates the presence of vegetable fats or oils. (*C. A.* **49**, 5002)

A note on the structure of oleic acid and ricinoleic acid. F. D. Gunstone (The University, St. Andrews, England). *Chem. & Ind.* **1955** (10), 250. An historical discussion of the application of Baruch's procedure to the location of the ethylenic linkages in oleic and ricinoleic acids.

Chemical-bromatological study of boliche oil (Sapindus saponaria). Fernandez F. Yolanda (Univ. nacl. mayor de San Marcos, Lima, Peru) **3**, 122–4 (1952). An analysis of the solvent-extracted, non-drying oil of *S. saponaria* is given. The oil can be used for food purposes. (*C. A.* **48**, 5390)

Unsaponifiable parts of oils and fats. Determination of total hydrocarbons, of squalene and sterols. A. Fabris and M. Vitagliano. *Ricerca sci.* **24**, 2062–78 (1954) (English summary). The I no. of the unsaponifiable part of olive oil is relatively high. Absorption chromatographic determination of the unsaponifiable part and its components gave values for the amount of hydrocarbons, squalene no., and the sterols. These can be used to detect adulteration of seed oil with olive oil and vice-versa. (*C. A.* **49**, 5005)

Rancidification of fatty substances in biscuits. A. Eeckhaut. *Bull. école meunerie belge* **15**, 130–8 (1953). Review. 29 references. (*C. A.* **49**, 526)

Histochemical study of lipide peroxides appearing in the skin after the action of various physical agents. P. Dubouloz and J. Dumas (Inst. natl. hyg., Paris). *Compt. rend. soc. biol.* **148**, 551–3 (1954). Chemical tests for detecting lipide peroxides in or on skin are discussed. (*C. A.* **49**, 411)

The chemistry of fatty esters used in toiletry. P. Desnuelle (Fac. sci. Marseille, France). *Parfumerie mod.* **46**(39), 35–46 (1954). A review of the esters, especially the partial esters, of higher fatty acids with polyhydric alcohols. Their structure, effect of interfacial tensions, and the analysis of various random mixtures of polyhydric alcohols and their mono-, di-, and tri-esters are examined. Methods of increasing yield of monoglycerides are discussed. (*C. A.* **49**, 4946)

The oil from Pistacia lentiscus. G. Cordella (Univ. Sassari. Italy). *Chimica e industria* (Milan) **35**, 912–13 (1953). The properties of oil from *P. lentiscus* were reexamined to find a basis for distinguishing it from olive oil or to detect adulteration of olive oil. Crude and refined oils have, resp., titer 50, 50; sapon no. 185.7, 188.2; volatile acid no. 0.11, 0.10; I. no. 85.9, 84.6; acetyl no. 13.36, 10.73. Neither these properties nor the reactions of Heydenrich, Hauchecorne, Brullé, or Bellier permit distinction of this oil from olive oil. (*C. A.* **49**, 646)

Alkali-catalyzed ethanolysis of vegetable oils. IV. Dipti Kalyan Choudhury and B. K. Mukherji (Univ. Coll. Technol., Calcutta). *Science and Culture* (India) **20**, 200–1 (1954). Coconut, hohua, and mustard oils were ethanolyzed for 5 and 60 min., resp., under the same conditions as reported previously (*C. A.* **49**, 4307) and the products fractionated. The component mixed fatty acids of the oils, as determined by spectrophotometry and the percentage increase of acids interesterified by prolonging interesterification are tabulated. It is confirmed that saturated acids interesterify more rapidly than the unsaturated acids and that the rate of ethanolysis of the latter decreases with increase in unsaturation. Preliminary removal of allyl isothiocyanate by solvent extraction enhanced the rate of interesterification of mustard oil. (*C. A.* **49**, 5004)

Composition of Indian tea-seed oils. S. R. Chakrabarty and M. M. Chakrabarty (Presidency Coll., Calcutta). *Science and Culture* (India) **20**, 186–7 (1954). Assam tea seeds consisted of 32% shell and 68% kernel. Their oils, analyzed spectrophotometrically by the methods of Hilditch, gave compositions resembling Indian peanut oils. (*C. A.* **49**, 5006)

Solvent refining of peanut and Mowrah oils with ethyl alcohol. J. S. Cama, M. H. Domadia, and J. G. Kane (Univ. Bombay). *Current Sci.* (India) **23**, 221 (1954). In a study of the suitability of EtOH for deacidification of some vegetable oils a mutual solubility curve for the system peanut oil-fatty acids-EtOH was determined by the agitation and turbidity methods. The solubility curve by the 2 methods did not agree and the deviation was greater on the oil side; the curves indicated that

90% by weight of EtOH is nonselective at room temperature and at atmospheric pressure, as far as the mixed fatty acids are concerned. With the use of more dilute EtOH, the region of heterogeneity is increased, with a maximum at 80% EtOH; this indicates sudden decrease in the solubility of the oil and its fatty acids in EtOH. (*C. A.* 49, 645)

Methods for the chemical analysis of ice cream. Brit. Standards Inst., London, W. 1. *Brit. Standards* 2472: 1954, 19 pp. 3 s. Methods of preparing samples, of determination of total solids, of fat by Rose-Gottlieb and a modified Werner-Schmidt method of sugars, ash, N, Ca, and P are given (*C. A.* 48, 10949)

Methods of analysis of cocoa butter. M. Borghi and C. Casolari. *Rev. intern. chocolat.* 9, 97–8(1954). Following the principles of Kaufmann (*C. A.* 29, 6784), the I index is determined with MeOH solution saturated with NaBr and containing 5.2 ml. of Br/l. A solution of the fat in 10 ml. of CHCl$_3$ is treated with 25 ml. of the reagent, 15 ml. of a 10% solution of NaI and 50 ml. of water are added, and the mixture is back-titrated with Na$_2$S$_2$O$_3$. To determine the ''partial I index'' the reagent contains 2.55 ml. of Br and 12.96 g. of I/l. of MeOH saturated with NaBr. This reagent saturates only one double bond in fatty acids which have more than one double bond. (*C. A.* 48, 10949–50)

Separation of oleic and isoöleic acids from hydrogenated vegetable oil by adsorption chromatography. T. J. Boman(Public Health Lab., Poona). *J. Sci. Ind. Research*(India) 13B, 718–20(1954). With alumina (Brockman) as the adsorbant and C$_6$H$_6$-petroleum ether (40–60°) mixture (1:1) as the solvent, oleic and isoöleic acid (R$_f$, 0.81 and 0.93 resp.) were separated from hydrogenated vegetable oil. The identification and purity of the acids were determined by their m.ps. and I values. (*C. A.* 49, 5004)

Export policy on oils and oilseeds reviewed. Anon. *Oils & Oilseeds J.* 7(8), 12–13(1955). The export policy in India in regard to linseed oil, mustard oil, rapeseed oil, and nigerseed oil continues to be one of free licensing. Exports of kardiseed and nigerseed are restricted.

Soap and its future in Saurashtra (India). Anon. *Oils & Oilseeds J.* 7(8), 6(1955). A discussion of current practices, local raw materials, and opportunities for using modern methods.

Animal fats. 5. The component acids of chimpanzee fat. F. D. Gunstone(Chem. Dept., Univ. of Glasgow). *Biochem. J.* 59, 454–455(1955). Chimpanzee fat contains palmitic (30%) and oleic acid (45%) as major components with octadecadienoic (8%), stearic (7%), and hexadecenoic acid (5%) as the most important minor component acids. It is similar to fats of similar iodine value from other herbivorous animals.

Animal fats. 6. The component acids of tiger fat and of puma fat. F. D. Gunstone(Chem. Dept., Univ. of Glasgow). *Biochem. J.* 59, 455–458(1955). In general terms the two fats reported in this paper are very similar in composition. Both contained oleic (38–40%), palmitic (24–27%), and stearic acid (10–11 %) as major components. The minor components include octadecadienoic acid (6–9%), octadecatrienoic acid (4–7%), hexadecenoic (5–6%), myristic (3–4%), and acids higher than C$_{18}$ (2–3%). The values found were from animals kept in captivity and are more unsaturated than specimens previously reported from wild animals of the same species. These differences are probably related to differences in diet.

The synthesis of C^{14}-carboxyl-labelled ω-thioethyl fatty acids. Anne E. Almond, Anna M. Burditt, D. E. Douglas, and Jean Eccles(Montreal General Hosp. Res. Inst., Montreal, P. Q.). *Can. J. Chem.* 33, 679–682(1955). Syntheses on a semimicro scale of thioethyl acetic, ω-thioethyl propionic, and ω-thioethyl butyric acids labelled with carbon-14 in the carboxyl group are described. The compounds were chromatographed on filter paper with butanol-water-ammonia as the developing solvent, and the R$_F$ values determined.

The mustard oil of rape seed, allylcarbinyl isothiocyanate, and synthetic isomers. M. G. Ettlinger and J. E. Hodgkins(Chem. Lab., The Rice Institute, Houston, Texas). *J. Am. Chem. Soc.* 77, 1831–36(1955). The mustard oil of rape seed was proved to be allylcarbinyl isothiocyanate, which was synthesized with *cis*- and *trans*-crotyl isothiocyanates.

Plasticization of polyvinyl chloride with alkyl esters of pinic acid. R. F. Conyne and E. A. Yehle(Rohm and Haas Co., Philadelphia 37, Pa.). *Ind. Eng. Chem.* 47, 853–55(1955). The permanence, stability, and low temperature properties of the *n*-octyl, octyldecyl, and 2-ethylhexyl diesters of pinic acid made these esters useful secondary plasticizers for polyvinyl chloride. Pinic acid diesters derived from lower alcohols were excessively volatile while the di-*n*-decyl ester was for most applications inadequately compatible as a secondary plasticizer.

The chemical nature of the fatty acids of a Group C streptococcus species. K. Hofmann and F. Tausig(Biochem. Dept., Univ. of Pitt., School of Med., Pittsburgh, Pa.). *J. Biol. Chem.* 213, 415–23(1955) . The fatty acid spectrum of a Group C *Streptococcus species,* strain H46A, has been qualitatively evaluated. The lipide content of the dry cells was 4.5 per cent. The major portion of these lipides was present in a ''bound'' form, and only a minor fraction was acetone-extractable (free lipides). The ''bound lipides'' were composed of small proportions of lauric and myristic acids and large proportions of C$_{16}$ and C$_{18}$ fatty acids. The C$_{16}$ fatty acid fraction contained palmitic, 9,10-hexadecenoic, and a small proportion of 11,12-hexadecenoic acids. In addition to stearic acid, the C$_{18}$ fraction consisted of a large proportion of *cis*-vaccenic acid and small proportions of oleic acid. A careful investigation of the highest boiling ester fractions derived from the ''bound lipides'' failed to reveal the presence of lactobacillic acid. The composition of the ''free lipides'' was similar to that of the ''bound lipides.''

On the identity of phytomonic and lactobacillic acids. A reinvestigation of the fatty acid spectrum of agrobacterium (phytomonas) tumefaciens. K. Hofmann and F. Tausig(Biochem. Dept., Univ. of Pittsburgh, School of Medicine, Pittsburgh, Pa.). *J. Biol. Chem.* 213, 425–32(1955). A reinvestigation of the chemical nature of the fatty acids of the plant pathogen *Agrobacterium tumefaciens* has led to results which differ significantly from those of previous workers. The lipides of this organism (7.5 per cent of dry weight of the cells) were found to contain palmitic acid (10 per cent), *cis*-vaccenic acid (68 per cent), lactobacillic acid (13 per cent), and unidentified high boiling materials (9 per cent). Presence of stearic acid could not be verified. The liquid-saturated fatty acid component previously called ''phytomonic acid'' was shown to be lactobacillic acid. The importance of *cis*-vaccenic acid as major constituent of bacterial lipides was stressed, and the possible role of intestinal bacteria as a source of the vaccenic acid of animal fats was discussed.

Statistical comparison of three methods for determining organic peroxides. C. Ricciuti, J. E. Coleman, and C. O. Willits (East. Util. Res. Branch, U. S. Dept. of Agriculture, Philadelphia 18, Pa.). *Anal. Chem.* 27, 405–07(1955). The polarographic method for determining hydroperoxides was compared with the more commonly used Wheeler iodide and stannous chloride chemical methods. The Latin square experimental design and statistical analyses were used to determine the relative accuracy and precision of the results obtained. The three methods gave results which were not significantly different for high purity tetralin hydroperoxide. For two hydroperoxide samples of lower purity and for three samples of autoxidized methyl oleate, the chemical methods gave values which were significantly higher than those by the polarographic method. With pure hydroperoxides the three methods apparently yielded identical results, but with impure products and polarographic method might give more reliable values because it was more specific than the chemical procedures.

Reichert-Meissl numbers of butterfat from commercial products produced in Kansas. W. D. Rutz, W. H. Martin, and C. H. Whitnah(Kansas Agricultural Experiment Station, Manhattan). *J. Dairy Sci.* 38, 387–90(1955). During August Reichert-Meissl numbers of butterfat from 169 samples of ice cream were determined. The arithmetical mean value was 29.19 and the range was 27.40 to 31.35. Reichert-Meissl numbers of 160 of the 169 samples (94.6%) were between 28.00 and 30.50. Over a one-year period, 105 samples of commercial butter from 10 butter-producing plants in Kansas were analyzed. Samples were collected monthly. The arithmetical mean Reichert-Meissl number was 28.40 and the range was 27.05 to 30.10.

The determination of total lipides in blood serum. W. M. Sperry and Florence C. Brand(Dept. of Biochem., New York Psychiatric Inst., and the College of Physicians and Surgeons, Columbia Univ., New York, N. Y.). *J. Biol. Chem.* 213, 69–76(1955). A method was described for the direct, gravimetric determination of the unmodified total lipides of blood serum or plasma. Oxidative degradation was avoided, and the lipides were freed of non-lipide contaminants. They might be used for the analysis of their constituents, and the method was therefore, economical of material. Evidence was presented for a high susceptibility of cholesterol to oxidative degradation.

Addition of hydrogen halides to α,β-unsaturated acids. W. R. Vaughan, R. L. Craven, R. Q. Little, Jr., and A. C. Schoenthaler (Dept. of Chem., Univ. of Michigan, Ann Arbor). *J. Am. Chem. Soc.* **77**, 1594–98 (1955). Evidence for the *trans* addition of hydrogen halides to α,β-unsaturated acids was reviewed and new evidence was presented to show that in general the addition occurred by a *trans* mechanism, which could not involve formation of a simple enolic intermediate or a classical carbonium ion.

Increase of the iodine number in semi-drying and drying oils by means of interesterification. R. Rigamonti and L. Carillo. *Olearia* **9**, 5–12 (1955). Eckey's method of interesterification at low temperature along with the crystallization of the saturated glycerides was applied to grape seed oils in order to increase their iodine numbers and consequently improve their drying qualities. Sodium methylate used by Eckey and alcoholic or 50% aqueous solutions of sodium hydroxide were all found to be satisfactory catalysts for the interesterification. After about 10 hours' reaction, interesterification ceased because an equilibrium in the statistical distribution of the several fatty acids was attained. The products with the highest iodine numbers and the best drying qualities were obtained by progressively lowering the temperature of the oil over a three-day period and adding a small quantity of catalyst daily during this time. By this procedure the iodine number of grape seed oil was raised from 138 to 159 while that of the linseed oil was increased from 168 to 184. Drying times were reduced by 15–18%.

A new procedure for fat splitting by percolation. G. B. Martinenghi. *Olearia* **9**, 9–20 (1955). A new industrial autoclave and subsidiary apparatus for hydrolytic fat splitting by percolation are described. Water vapor is bubbled through the immobile fat to initiate the splitting. Cleavage is completed by allowing finely subdivided water to percolate through the fat while the sweet water is continuously withdrawn without interrupting the process. With this equipment a charge of four tons of fat can be split in a single operation of only six hours' duration (including charging and discharging) without the aid of a catalyst. The degree of splitting is at least 95%, 96%, or 97% for pressures of 20, 25, or 30 atmospheres, respectively. The recovered aqueous glycerine is at least 3.5 Bé.

The reported lecithinase activity of egg yolk and dried egg. C. H. Lea and R. A. L. Wilson (Low Temp. Station for Res. in Biochem. & Biophys., Univ. Cambridge and Dept. Sci. and Indus. Res.). *J. Sci. Food Agr.* **6**, 153–7 (1955). Although previous workers have found considerable lecithinase activity in spray-dried whole egg and egg yolk, in the samples of fresh egg yolk or spray-dried whole egg of good quality examined by Lea and Wilson little lecithinase activity was found. The activity previously observed may have resulted from the action of microbial enzymes, possibly phospholipase C which hydrolyzes lecithin to phosphorylcholine and diglyceride.

The nature of bacterial lipides in the rumen of hay-fed sheep. G. A. Garton and A. E. Oxford (Rowett Res. Inst., Bucksburn, Aberdeenshire). *J. Sci. Food Agr.* **6**, 142–8 (1955). Lipides were isolated in yields of about 9% from rumen bacteria of two hay-fed sheep. These lipides consisted of 39.2% phospholipides, 38.2% neutral fat, 12.4% lower fatty acids (probably rumen fermentation products), 10.1% unsaponifiable matter, and 0.1% of a steam volatile, neutral solid. The saponification equivalent of the fatty acids from the neutral fat was 312.0. No linoleic or linolenic acid was found in the neutral fat or phospholipides. The phospholipides contained mono- and diaminoglycerylphosphatides. The unsaponifiable matter contained some pigments (probably xanthophylls) and a steroid-like material which was not identical with hydrated cholesterol although many of the properties were similar.

The component fatty acids and glycerides of coconut oils. Amy P. Dale and M. L. Meara (The University, Liverpool). *J. Sci. Food Agr.* **6**, 162–6 (1955). Coconut oils from Indonesia (I), Solomon Islands (II), and Ceylon (III) were analyzed by distillation of methyl esters and by fractional crystallization from acetone. Oils I, II, and III contained the following acids, respectively (as % by wt.): caproic, 0.2, 0.3, ...; caprylic, 7.7, 8.1, 7.3; capric, 9.7, 8.1, 7.5; lauric, 45.0, 46.3, 47.8; myristic, 18.0, 17.4, 18.9; palmitic, 8.4, 8.6, 7.6; stearic, 3.7, 2.0, 2.5; arachidic, ..., 1.5, 0.4; oleic, 5.8, 5.5, 6.3; linoleic, 1.5, 2.2, 1.7. The oils consist of 81.8% trisaturated and 18.2% disaturated-monounsaturated glycerides consisting of at least 21 molecular types. These include 15% myristodilaurin, 13% lauromyristopalmitin, 10% caprolauromyristin, 10% caprodilaurin, and smaller amounts of caprylocaprolaurin, caprylolauromyristin, and palmitolaurin. Results demonstrate that pure triglycerides cannot be isolated from coconut oil by fractional crystallization.

The component fatty acids and glycerides of palm kernel oil. Amy P. Daly and M. L. Meara (The University, Liverpool). *J. Sci. Food Agr.* **6**, 166–9 (1955). Palm kernel oil having saponification equivalent of 230.5, iodine value of 16.7, free acidity (as lauric) 8.1%, and containing 1.6% unsaponifiable matter was analyzed by distillation of the fatty acid methyl esters and by fractional crystallization of the oil from acetone. Fatty acid contents (as % by wt.) were: caprylic 2.4, capric 3.7, lauric 45.2, myristic 18.6, palmitic 8.5, stearic 2.5, arachidic 1.9, oleic 15.1, and linoleic 2.1. Crystallization revealed a complex mixture of glycerides consisting of 61.5% trisaturated glycerides, 37.3 disaturated-monounsaturated, and 1.2 diunsaturated-monosaturated. Major components (estimated at % by wt.) were: caprodilaurin 9.6, myristolaurin 27.1, palmitodilaurin 8.4, oleocaprolaurin 12.1, oleolauromyristin 10.6, and oleolauropalmitin 9.0.

The rate of evaporation of water through fatty acid monolayers. R. J. Archer and V. K. LaMar (Dept. Chem., Columbia Univ., New York, N. Y.). *J. Phys. Chem.* **59**, 200–8 (1955). The influence of fatty acid monolayers on the rate of evaporation of water was studied by measuring the rate of absorption of water vapor by anhydrous lithium chloride supported above the water surface. Data are reported as specific resistance of the monolayer to evaporation and show that contaminants (usually solvent) introduced during the formation of monolayers have caused serious errors in previous experiments of this type. The resistance of monolayers of C_{17}, C_{18}, C_{19}, and C_{20} saturated fatty acids was measured as a function of surface pressure, chain length, monolayer phase, subphase composition, and surface temperature. All monolayers decreased the rate of evaporation of water by a factor of about 10^4. In the liquid condensed phase, monolayer resistance is independent of surface pressure and subphase pH but the logarithm of the resistance is a linear function of chain length. In the solid phase on an alkaline subphase containing Ca^{++}, the logarithm of the resistance is a linear function of both the chain length and surface pressure. A theory is proposed for the source of the energy barrier.

The methods of examination of fats and fat products. Committee reports. Tomotaro Tsuchiya, *et al.* *J. Oil Chemists' Soc., Japan* **3**, 235–9, 298–301 (1954). The methods described include the following: moisture (distillation method) and crude protein of the raw materials of fats, residual lint of cottonseeds, reaction (of hot-water extract against phenolphthalein and methyl orange), moisture, ash, impurities, loss on purification, and phospholipide of fats and oils.

Plasticizers from fatty oils. II. Plasticizers from coconut-oil lower fatty alcohols, sperm alcohols, phthalic acid, and aliphatic dibasic acids. Koichi Murai, Giichi Akazome, Naraichi Tsujisaka, and Mahisa Sakurai (Nihon Yushi Co., Osaka). *J. Oil Chemists' Soc., Japan* **3**, 200–3 (1954). Phthalic acid esters were synthesized and examined as plasticizers for polyvinyl chloride. The esters synthesized included di-*n*-octyl phthalate (DOP), di-*n*-decyl phthalate, di-*n*-lauryl phthalate, butyl decyl phthalate, butyl lauryl phthalate, methyl oleyl phthalate, di-(2-ethylhexyl) phthalate, di-(*sec*-octyl) phthalate, di-(isooctyl) phthalate, di-(3,5,5-trimethylhexyl) phthalate, di-(diethyleneglycolmonoethylether) phthalate, butyl cetyl phthalate, and methyl cetyl phthalate. Among them the last 2 were essentially nonmiscible with polyvinyl chloride, but the others were all miscible. Most of them were comparable with DOP in mechanical properties of the film consisting of 2 parts of polyvinyl chloride and 1 part of plasticizers. They were superior also in stability in lower temperatures. Another group of plasticizers synthesized included di-(2-ethylhexyl) malonate, di-(2-ethylhexyl) succinate, di-(2-ethylhexyl) adipate, di-(2-ethylhexyl) azelaate, di-(2-ethylhexyl) sebacate, di-(2-ethylhexyl maleate, di-(sec-octyl) adipate, di-(3,5,5-trimethylhexyl) azelaate, and dibenzyl adipate. All were miscible with polyvinyl chloride except the last one. The azelaates were excellent plasticizers.

Soybean oil industry (of Japan). Mitsuo Nakamura. *J. Oil Chemists' Soc., Japan* **3**, 272–5 (1954). Domestic production of soybeans (429–521 thousand tons, varying with year) is insufficient for the consumption (878 thousand tons in 1953). Most imported soybeans come from U.S.A. The quality of imported soybeans has been improved. Makers of soybean oil are listed in groups according to the system of extraction used.

The uses of soybean cake (or flake and meal) consists of soy sauce (shôyu) 44%, fodder and fertilizer 25%, miso 17%, monosodium glutamate 9%, and adhesives and other industrial uses 3%. Soybean oil is used chiefly (87–89%) for edible purposes.

Fatty acid nitriles. IV. Catalytic hydrogenation with nickel kieselguhr. Saburo Komori, Eiichiro Asano, Yukio Harada, and Shoichi Nishimura(Osaka Univ.). *J. Oil Chemists' Soc., Japan* **3**, 261–2(1954). Lauro-, myristo-, palmito-, and stearonitriles and hydrogenated tallow acid nitriles were hydrogenated with the catalyst consisting of reduced Ni and kieselguhr (1:4) at 120–135° to obtain corresponding primary amines. The yield of primary amines was higher at sufficient partial pressure of NH_3 and from lower nitriles.

Separation of fatty acids by the formation of urea complexes. I. Recovery of urea. Hiroshi Sakurai(Osaka Univ.). *J. Oil Chemists' Soc., Japan* **3**, 263–5(1954). From the viewpoint of the recovery of urea the heterogeneous phase reaction in water was better than the homogeneous phase reaction in methyl alcohol. Experiments were made with distilled fatty acids from rice bran oil. The urea complexes were decomposed with nonreacted urea in water at 35–48°. The temperature of decomposition should be higher when less water is present. Aqueous urea could be repeatedly used in forming urea complexes by warm decomposition of urea complexes without filtration.

II. The formation of tight complexes and emulsive products by continuous use of urea. *Ibid.* 265–7(1954). When aqueous urea and fatty acid (in benzene) were reacted for a longer period (about 20 hrs. at 25°) or when the urea complex was allowed to stand for 20 hrs. at lower temperature (10°), tight complexes were formed which were decomposed only at higher temperature (46–8°). Myristyl alcohol did not form such tight complexes under the same conditions.

Fat processing industries (of Japan). Shin'ichi Tomiyama. *J. Japan Oil Chemists' Soc.* **4**, 32–5(1955). Statistics on the production, price, uses of hydrogenated oils, fatty acids, and glycerol.

Aquatic (animal) oil industry (of Japan). Hideo Higashi. *J. Oil Chemists' Soc., Japan* **3**, 278–80(1954). The yearly production of fish and whale oils was 19–23 thousand tons in 1950–53. Their importance in economics and nutrition is emphasized.

The lecithin and cephalin of the fat of sawa-millet (Panicum crus-galli) oil. Tetsujiro Obara and Mitsuo Kitamura(Tokyo Univ. Education). *J. Agr. Chem. Soc. Japan* **29**, 37–9(1955). This oil contained 0.31% phosphatide (acetone insoluble matter). This was purified and amounted to about 0.14% phosphatide, consisting of 23% lecithin and 76% cephalin. Both were hydrolyzed and the components were identified.

The margarine and shortening industries (of Japan). Hisato Murata. Statistics on the production of margarine and shortening in 1927–53, and on the raw materials for margarine in 1940–53 are given. Whale oil and recently coconut and soybean oils are used widely. Newer apparatus has been imported from the U.S.A.

Tall oils. I. Properties and fatty acid components of a sample of Japanese tall oil. Taro Matsumoto and Choichiro Hirai (Nihon Univ., Tokyo). *J. Oil Chemists' Soc., Japan* **3**, 270–2 (1954). This tall oil obtained from the wood of *Pinus densiflora* showed d_4^{30} 1.0020, n_D^{30} 1.4808, $[\alpha]_D^{20}$ −2.3 (3% solution in $CHCl_3$), neutralization no. 186.0, ester no. 2.4, iodine no. 124.4, and unsaponifiable matter 12.0%. This consisted of 40% fatty acids and 48% resin acids. The former consisted of 5.6% saturated, 56.4–58.4% oleic, 36–8% linoleic acids. The resin acids contained 31.1% abietic acid.

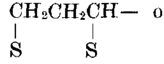
Some lesser known aquatic animal oils. Yoshiyuki Toyama and Hideko Takai(Nagoya Univ.). *J. Oil Chemists' Soc., Japan* **3**, 268–9(1954). The following oils were analyzed (mostly for the first time) for specific gravity, refractive index, acid no., saponification no., iodine no., unsaponifiable matter of the oil; neutralization no., iodine no., solid acid content, and ether-insoluble polybromide of mixed fatty acids. The name of the oil, *saponification no., and iodine no.* (*Wijs' method*), *resp.*, were: *Grampus orca* oil, 186.5, 112.3 (isovaleric acid, cetyl alc., and oleyl alc. were detected as constituents); blubber oil from *Balaena glacialis*, 186.6, 132.2; body oil of adult *Mugil cephalus*, 197.8, 159.0; that of young *M. cephalus*, 200.2, 163.1; viscera oil of young *M. cephalus*, 195.6, 151.7; body oil of *Trachurus japonicus* 192.4, 136.7; viscera oil of *T. japonicus*, 188.5, 135.8; body oil of *Hexagrammos otakii*, 184.7, 153.9; body oil of *Hexagrammos otakii*, 184.7, 153.9; body oil of *Ophiocephalus tadianus*, 173.3, 116.7; viscera oil of *O. tadianus*, 189.1, 124.2; liver oil of *Katsuwonus vagans*, 132.6, 239.4; and liver oil of *Spheroides pardalis*, 180.3, 171.9.

Method of manufacturing butter. H. A. Toulmin, Jr.(Commonwealth Engineering Co. of Ohio). *U. S. 2,505,654*; reissue *23,988*. Water is removed from the cream bearing liquid by freezing. The oily concentrate is thawed and then churned into butter.

Refining and bleaching fatty acid esters. G. Barsky(E. F. Drew and Co., Inc.). *U. S. 2,705,722*. Fatty acid esters of glycerol or polyglycol are simultaneously alkali refined and bleached by treatment with dry alkali metal carbonate and 0.5 to 2.5 per cent by weight of 30 per cent hydrogen peroxide at 80 to 110°C.

Separation of oleic acid from stearic and palmitic acids. C. W. Hoerr(Armour and Co.). *U. S. 2,705,773*. The mixture of oleic, stearic and palmitic acids is crystallized from acetonitrile containing 3 to 25 per cent water. The water increases the solubility of the oleic acid and increases the temperature range over which oleic acid is completely miscible with acetonitrile.

Process for recovering fats and oils. S. D. Chaloner and D. McNicoll(H. T. Noble and E. McNicoll). *U. S. 2,706,201*. Fats and oils are recovered from spent adsorbent earths by treatment with aqueous sodium hydroxide at 60°C. The soap which forms causes good separation of the earth from oils, fats and waxes when the mixture is subsequently heated to 100°C.

Stabilized edible fats and oils. N. E. Searle(E. I. duPont de Nemours and Co.). *U. S. 2,706,158*. The preservative is an organic sulfur compound having a molecular weight no greater than 500 and having the generic formula R—R′—COR″ wherein *R* has the structure  $\underset{\overset{|}{S}}{CH_2}CH_2\underset{\overset{|}{S}}{CH}-$ or $CH_2(SH)CH_2CH(SH)-$ or is the lower alkyl derivative of one of these radicals, *R′* is a divalent hydrocarbon radical of no more than eight carbon atoms, and *COR″* is carboxyl or a group hydrolyzable to carboxyl.

Antioxidant compositions. Barbara T. Lehmann and Betty M. Watts(Monsanto Chem. Co.). *U. S. 2,707,154*. The antioxidant mixture consists of the following compounds in proportions to make up 100% by wt.: 1 to 10% phenolic antioxidant, 10 to 80% of ascorbic acid or its alkali metal salts, and 10 to 80% of dehydrated sodium or potassium phosphates.

• Biology and Nutrition

F. A. Kummerow, Abstractor
Joseph McLaughlin, Jr., Abstractor

The fate of radioactive cholesterol in mice with modified thyroid activities. S. B. Weiss and W. Marx(Lab. Division, Los Angeles County Hospital, Los Angeles, Calif.). *J. Biol. Chem.* **213**, 349–53(1955). Hyper- and hypothyroid mice were injected with radioactive cholesterol. The distribution of isotope in the sterol and saponifiable fractions of carcass and excreta was determined after periods of 48 and 96 hours. It was observed that the thyroid hormone stimulated the degradation of cholesterol, in particular, its conversion to acidic products, and the excretion of the sterol itself and of some of the acidic products formed.

Studies of the in vitro lipid metabolism of the human skin. I. Biosyntheses in scalp skin. N. Nicolaides, O. K. Reiss, and R. G. Langdon(Depts. of Med. and Biochem., Univ. of Chicago, Chicago, Ill.). *J. Am. Chem. Soc.* **77**, 1535–38(1955). The incorporation of isotopic carbon from 1-C^{14} acetate into the lipids by human scalp skin slices was studied. Acetate was incorporated into the fatty acids, squalene, sterols and probably the wax alcohols. Of the total activity, 40% was incorporated into squalene while only 2.6% was found in the sterols. Squalene has been recently implicated as a sterol precursor. The high squalene content of human scalp skin made direct isolation of this hydrocarbon possible. Its specific activity was found to be 10 times higher than that of the sterols, an observation which supported the above implication.

Some salts of the phosphoric ester of vitamin D_3. N. A. Milas, P. Davis, and L. Chiang(Dept. of Chem., Massachusetts Institute of Technology, Cambridge). *J. Am. Chem. Soc.* **77**, 1640–43

(1955). A new phosphorylation method applicable to very sensitive substances like vitamins A and D has been developed. This method has been applied to vitamin D_3 and the sodium, calcium and barium salts of vitamin D_3 phosphate have been obtained in micro-crystalline form. While the sodium salt was completely soluble in water the others were insoluble, but dissolved readily in hydrocarbon solvents. From their physical properties these salts have been found to be polymeric (trimeric) and tentative structures have been suggested for each.

Infrared spectra and cis-trans configurations of some carotenoid pigments. K. Lunde and L. Zechmeister (Gates and Crellin Laboratories of Chemistry, California Inst. of Tech., Pasadena). *J. Am. Chem. Soc.* **77**, 1647–53 (1955). Infrared spectra in relationship to *cis-trans* configurations were reported for some representatives of the following stereoisomeric sets: β-carotene, zeaxanthin, lycopene, α-carotene, γ-carotene, dimethylcrocetin and methylbixin. The influence of the spatial configurations on these spectra was manifest in the regions $\sim$ 7.25, 10.0–10.6 $\sim$ 13 μ. Considering the new data, some configurations proposed earlier on the basis of spectral phenomena, observed in the visible and ultraviolet regions, have been confirmed while some others had to be revised.

Tocopherol content of Canadian butterfat and its use in detecting adulteration. Constance Anglin, J. H. Mahon, and R. A. Chapman (Dept. of National Health and Welfare, Food and Drug Labs., Ottawa, Ontario). *J. Dairy Sci.* **38**, 333–39 (1955). Tocopherol contents have been determined for 329 Canadian commercial butterfats in a 1-year survey. The monthly mean tocopherol contents in parts per million are: June, 34; July, 40; September, 42; October, 42; November, 31; December, 27; January, 21; February, 19; April, 21; and May, 26. The over-all tocopherol range was 10 to 50 with a mean content of 31. An example of the use of the tocopherol determination for the detection of butter adulteration was given.

The estimation of hydroxysteroids. B. Baggett, L. L. Engel, and Linda L. Fielding (Dept. of Biol. Chem., Harvard Med. School, Boston, Mass.). *J. Biol. Chem.* **213**, 87–97 (1955). A method was presented for the quantitative estimation of acylable hydroxyl groups in lipides. The urinary excretion of neutral acylable lipides has been found to correlate with the state of endocrine function, suggesting that the compounds measured were predominantly steroids.

Life span of mice fed a high fat diet at various ages. Ruth Silberberg and M. Silberberg (Snodgras Lab., St. Louis City Hospital Division, Washington Univ., School of Medicine, St. Louis, Missouri). *Can. J. Biochem. & Physiol.* **33**, 167–173 (1955). The effect of a high fat diet on life span depends on strain and sex of the animal tested and is specifically due to the fat content, and not to the high caloric value, of the diet. In male mice of strain C57BL, feeding of a high fat diet from the ages of 1, 6, or 12 months on through life shortened the life span. If the high fat diet was given for a limited period of time, the effect on life span depended on the age at which these mice were placed on the high fat ration.

Inhibition of cholesterol formation by rat liver homogenates. B. B. Migicovsky (Chemistry Division, Science Service, Dept. Agriculture, Ottawa, Canada). *Can. J. Biochem. & Physiol.* **33**, 135–138 (1955). The inability of liver homogenates, from starved and vitamin A deficient rats, to synthesize cholesterol is illustrated. A possible reason for this phenomenon is that these preparations inhibit cholesterol syntheses when added to a liver homogenate from a normal rat. The inhibitory factor or factors are present in both the supernate and residue portions of the homogenate, although the residue matter is more inhibitory.

On the gastric lipolysis of fat. D. C. Herting and S. R. Ames (Research Labs., DPI, Division of Eastman Kodak Co., Rochester, N. Y.). *Arch. Biochem. & Biophys.* **55**, 295–297 (1955). Adult rats of the Sprague-Dawley strain were fed diets which included cottonseed oil (I.V. about 110) and prime steam-rendered lard (I.V. about 55) and fully hydrogenated lard (I.V. 0). The results obtained appeared to indicate that the amount of fatty acid in the stomach was dependent upon the saturation or unsaturation of the fatty acids.

Studies on the metabolic interplay of fatty acids, succinate and electrolytes. R. P. Geyer, Ethel J. Bowie, Mary S. Gongaware and Marion A. Ryan (Harvard School of Public Health, Dept. of Nutrition, Boston, Mass.). *Arch. Biochem. & Biophys.* **55**, 104–112 (1955). Data are given on the metabolism of radiofatty acids and radiosuccinate by heart, kidney, spleen, and liver. The effects of succinate, malonate, and electrolytes on fatty acid metabolism are shown and discussed.

Embryonic and postembryonic changes in the lipids of Ascaris lumbricoides eggs. D. Fairbairn (McGill Univ., Macdonald College, Quebec). *Can. J. Biochem. & Physiol.* **33**, 122–129 (1955). Unembryonated ascaris eggs contained amounts of saponifiable and unsaponifiable lipids estimated to exceed 50% of the protoplasmic solids. The saponifiables (75–80% of the total lipids) consisted of triglycerides and much smaller quantities of phospholipids. Volatile acids comprised a significant part of the total triglyceride fatty acids. The unsaponifiables (>20% of the total lipids) contained ascaryl alcohol as the major component. Unesterified sterols were also present. During embryonation and postembryonic survival of the eggs, the saponifiables decreased to 25% of the initial amount present, whereas unsaponifiables remained constant. Death of the embryos coincided with failure to utilize the remaining saponifiables.

The lipid components in the vitelline membrane of Ascaris lumbricoides eggs. D. Fairbairn and Beverley I. Passey (McGill Univ., Macdonald College, Quebec). *Can. J. Biochem. & Physiol.* **33**, 130–134 (1955). The preparation of embryonated ascaris eggs enclosed only by the vitelline membrane is described. No impairment of membrane structure or function was observed. Membrane and larval fractions were separated, and their lipids analyzed. The membrane lipids were nearly all unsaponifiables, and consisted mainly of ascaryl alcohol. Larval lipids were primarily saponifiable, but also contained significant amounts of ascaryl alcohol, and nearly all of the sterols. Because the vitelline membrane dissolved in chloroform and similar solvents, ascaryl alcohol was judged to be a major component. The results are compared with previous observations and hypotheses concerning the vitelline membrane of nematode eggs.

An assay method for lipoxidase in animal tissue. D. H. J. Boyd and G. A. Adams (National Res. Labs., Ottawa, Canada). *Can. J. Biochem. and Physiol.* **33**, 191–198 (1955). An assay for lipoxidase in animal tissues has been developed which eliminates the interference of heme compounds. Catalytic oxidation of linoleate emulsions at pH 9.0 by heme pigments was inhibited by potassium cyanide while lipoxidase activity was relatively unaffected. The assay method was capable of detecting extremely low levels of lipoxidase activity in animal tissue. Application of the method to beef and pork adipose tissue, uncured bacon, cured unsmoked bacon, and rabbit liver, kidney, spleen, heart, brain, and lung strongly suggested that lipoxidase was not present in these tissues and the linoleate oxidation was catalyzed by the heme pigments in the extracts.

The relationship between nutrients and metabolism of body fat. I. The effect of the dietary fat and protein on the activities of liver choline oxidase and lipase. Akira Yoshida and Kiyoshi Ashida (Nagoya Univ., Anjo, Aichi-ken). *J. Agr. Chem. Soc. Japan* **29**, 135–8 (1955). There seemed to be little interrelationship between the level of fat in the diet and activities of choline oxidase and lipase in both the *ad libitum* feeding and paired feeding experiments. When the protein level was changed, the activity of choline oxidase increased in proportion to the increase of protein level from 0 to 30%, but the lipase activity dropped only at 0% protein level. When based on the growth data, the rate of gain in body weight was higher on the fat-containing diet, if protein, vitamins, salts, and calorie intake were equal. This difference could not be seen when large amounts of thiamine and riboflavin were added.

Nutritive value of safflowerseed cake. M. Narayana Rao, M. Swaminathan, and V. Subrahmanyan (Central Food Technol. Research Inst., Mysore). *Bull. Central Food Technol. Research Inst.* **3**, 158–9 (1954). By using methods of A.O.A.C., the following composition of seed cake flour was determined: moisture 7.6, ash 4.1, protein 32.1, fat (ether extract) 12.0, Ca 0.075, P 0.62, thiamine (mg./100 g.) 0.63%. When safflower seed cake was added at a 10% level to poor rice diet of rats, significant growth rates were noted. The proteins of safflower seed are of fairly high biological value, though inferior to casein. (*C. A.* **49**, 535)

Influence of the products of oxidation of lipides on the action of pancreatic lipase. Armand Hérisset. *Compt. rend.* **239**, 1438–9 (1954). Pancreatic lipase was incubated at 37° with normal and autoxidized olive and peanut oils and the extent of hydrolysis was then determined. Use of autoxidized oils retarded the rate of enzymic hydrolysis. (*C. A.* **49**, 4742)

Rapeseed-oil meal in broiler rations with observations on the nature and control of its metabolic inhibitors. Dorothy S. Dow and C. E. Allen (Can. Dept. of Agr., Ottawa). *Can. J. Agr. Sci.* **34**, 607–13 (1954). The substitution of 17% rapeseed-oil meal in a broiler ration gave equally good growth and quality as a known high quality ration. The inclusion of iodide at a level of 3 p.p.m., calculated as I, controlled the goitrogenic and antithyroid effects of rapeseed oil. It is suggested, therefore, that the goitrogenic principle is a thiocyanate. (*C. A.* **49**, 4905)

Newer concepts of the role of fats and of the essential fatty acids in the diet. H. J. Deuel, Jr. (Univ. Southern Calif., Los Angeles). *Food Research* 20(1), 81–91(1955). Much evidence has accumulalted to support the hypothesis that fats are essential components of the diet. Whether or not the essentiality of fats is based entirely on their being sources of the so-called essential fatty acids is a moot question. However, the pronounced advantageous effect of fats on growth, pregnancy, lactation, nitrogen-sparing action, work capacity, and period of survival indicates their importance. Fats also show specific effects in preventing x-irradiation injury and capillary permeability and in regulating cholesterol deposition and metabolism.

Animal fats in livestock feeds. W. C. Ault and R. W. Riemenschneider (Eastern Reg. Research Lab.). *Chemurgic Digest* **13** (11), 4–5, 19(1954). The large-scale use of fats, especially inedible grades of animal fats, has begun. Advantages claimed are increases in feed efficiency, vitamin stability, appearance, ease of pelleting and decreases in wear on handling equipment. The nutritional value of these surplus animal fats is high in relation to their cost. The addition of approved antioxidants is recommended to retard oxidation of the fats and rancidification of the fat-containing feeds.

Nutritive value of safflowerseed cake proteins. B. R. Baliga, R. Rajagopalan, and K. Shivaramaiah (Indian Inst. Sci., Bangalore). *Indian J. Med. Sci.* **8**, 704–8(1954). The amino-acid composition and biological value of safflower-seed cake compare favorably with those of casein. (*C. A.* **49**, 4905)

Influence of α-tocopherol on basal metabolism. W. Baroni and G. Casa (Univ. Bologna, Italy). *Minerva med.* **1953**, II, 440–3. α-Tocopherol lowers the basal metabolism rate of man as determined by 0 uptake. (*C. A.* **48**, 5308)

• Waxes

R. L. Broadhead, Abstractor

Alcoholysis of oils, fats, and waxes. Societe Belge de l'Azote et des Produits Chimiques du Marly Soc. Anon. *Belg. 527,076.* Liquid and solid fats and waxes are treated with lower fatty alcohols ($\leqq$ 12 C atoms) and transesterified to esters of fatty acids with lower alcohols, with liberation of higher fatty alcohols. The reaction mixture is passed over a Zn silicate catalyst. After reaction, the mixture of Me ester, glycerol, unreacted oil, and excess MeOH is cooled and injected into a washing tower containing Raschig rings. A countercurrent stream of water takes up the glycerol and the excess alcohol, which are separated by distillation and evaporation. The esters and oil, insoluble in water, are evacuated at the top of the tower. (*C. A.* **49**, 3559)

Retention of amines in wax polish and amine soap films. Helen E. Wassell (Carbide & Carbon Chemicals Co., New York, New York). *Proc. Chem. Specialties Mfrs. Assoc.* Dec., 1952, 158–61. Studies with typical formulations showed that no monoethanolamine (I), morpholine (II), or dimethylethanolamine (III), and only 27% of the triethanolamine (IV) and 22% of the aminomethylpropanol (V), used in making a polish, remained in the oven-dried film to be considered as part of the total solids. These proportions of amines remaining in oven-dried films did not represent those left in air-dried films, since about 15% II, 57% I, 90% V, and 98% IV was retained in films after drying 6 days. The loss in weight of the carnauba or other wax and the oleic acid should be considered when calculating the amounts to use in a polish in order to obtain the desired total solids in an oven-dried film. The increase in the H_2O-resistant properties of a rubless-polish film can be attributed to a gradual conversion of triethanolamine oleate to a H_2O insoluble ester. II or III should be used to produce a polish whose film is resistant to scrubbing with detergent and H_2O, while some nonvolatile amine, e.g., IV, should be used with II or III, where the film is to be resistant to H_2O-spotting, but not to scrubbing with H_2O and detergent (*C. A.* **49**, 4309)

Compatibility studies of silicone oils with natural synthetic waxes and waxlike substances. Joy Bickmore Plein and E. M. Plein (Univ. of Washington, Seattle). *Drug Standards* **22**, 228–43(1954). A procedure for determining the comparative compatibility of a series of 42 waxes and waxlike substances with silicone oils is described. Of these substances, 17 were found to have varying degrees of compatibility with silicone oils. Synthetic Japan wax, Alrowax 75, No. 44 wax, and spermaceti were the most compatible. In general, the milling of wax-silicone oil mixtures increased the compatibility of the constituents; silicone oil of 1000 centipoises shows better compatibility with the above substances than does the oil of 50 centipoises. (*C. A.* **49**, 4230)

Discussion of carnauba wax. Jose Bettencourt Machado (Brazilian Govt. Trade Bureau, New York, N. Y.). *Chem. Specialties Mfrs. Assoc., Proc.* **1952**, 147–8. A discussion is presented of the possible causes of differences in ease of emulsification of various grades and the nonuniformity of carnauba wax. (*C. A.* **49**, 3557)

Special process shellacs for emulsion floor waxes. I. Lipman (Acme Shellac Products Co., Newark, N. J.). *Chem. Specialties Mfrs. Assoc., Proc.* **1952**, 138–9. Cold-Pro Grade 60 produced by a new cold process of bleaching shellac and rapid drying with moisture-controlled air can be formulated into floor waxes of outstanding gloss. (*C. A.* **49**, 3557)

The relation between laboratory testing and field-performance testing (of floor waxes). J. J. Crawford (General Services Admin., New York, N. Y.). *Proc. Chem. Specialties Mfrs. Assoc.,* **May, 1953**, 153–3, discussion 153–4. The qualitative relation between laboratory and field tests in reference to gloss, leveling, slipperiness, soiling resistance, abrasive wear, and H_2O resistance and the factors which adversely affect the degree of correlation are discussed. Suggestions are given for improving laboratory tests. (*C. A.* **49**, 4310)

• Drying Oils

Raymond Paschke, Abstractor

Copolymerization of styrene and drying oils. S. E. Bradshaw and E. M. Evans (British Resin Products, Ltd.). *U. S. 2,698,839.* This patent covers a process which comprises copolymerizing, by the action of heat, a styrene compound with a vegetable drying oil in the presence of a transfer agent selected from the group consisting of carbon tetrachloride, ethylene dichloride and tetrabromethylene.

Process of producing conjugated fatty acids. R. T. Arnold (General Mills, Inc.). *U. S. 2,698,857.* This patent covers a process of producing conjugated fatty acids from monoolefinic fatty acids which comprises preparing a solution of an alkali metal salt of the fatty acid and an alkali metal hypochlorite, passing carbon dioxide through said solution to liberate hypochlorous acid, reacting the hypochlorous acid with the fatty salt to form the chlorohydrin, reacting the chlorohydrin with a mixture of an alkali metal acetate, acetic anhydride and acetic acid to form the diacetate of the fatty acid and pyrolyzing the diacetate.

Dehydrated castor oil. Satoshi Nakajima and Kiichi Kosuge (Soken Chemical Co.). *Japan 2837 (1954).* Castor oil with 0.2% H_2NSO_3H and 3% kaolin is heated under vacuum (5 mm. Hg) for 1.5 hours at 250° and filtered to give a dehydrated castor oil with a hydroxyl number of 10.6 (*C. A.* **49**, 5001)

• Detergents

Lenore Petschaft Africk, Abstractor

New active agents for and bacterologic tests of bactericidal soaps. H. Zilski. *Seifen-Ole-Fette-Wachse* **80**, 467–8, 491–4 (1954). Tests using *Micrococcus Pyogenes* var. *aureus* and *Escherichia coli* were carried out with 4–8% solutions of bactericidal soaps containing Raluben P (I), chlorophyllin, 2–3% Ferment System (FS) 88 which inhibits protein-decomposing enzymes and activates synthesizing enzymes (II), Jaudas (III), 4% T 153 (biochemical agent containing CH_2O derivative), FS 64 (CH_2O derivative containing biochemical agent), Hexachlorophene (IV), and 0.5% Penetrane (organic Hg compound). Soaps containing I or IV are light-sensitive; in soaps containing I, darkening can be prevented by the addition of a small amount of Sudan orange. New biochemical agents such as II and III are suitable for the preparation of deodorizing soaps. (*C. A.* **49**, 2759)

Are synthetic detergents injurious to the skin? H. Stupel (Seifenfabrik Hochdorf, Hochdorf, Switzerland). *Soap, Perfumery, Cosmetics* **28**, 58–62, 300–4, 306(1955). The structure.

properties and functions of the skin are reviewed. The concept of buffer-defence replaces the older idea of a "physiological acid mantle." The following actions of detergents are discussed: alkalinity, swelling, irritation, protein reaction and degreasing. Alkalinity, swelling and irritation are rather more strongly pronounced with soap products than with detergents. In the case of alkalinity it does not depend as much on pH as upon the titratable alkali content. Toilet soaps are no milder than household cleaners provided the latter contain no added alkali. Swelling depends on pH, the molecular weight and also the type and presence of builders. Irritation is specifically connected with low molecular fatty acid soaps which are not present in detergents. Protein adsorption and defatting cannot be easily distinguished. Individual raw materials possess varying effects upon the skin. The straighter and longer the chief valency chain, or the more closely related to lipoids the molecule, the better for the skin. Cleansing agents which are mild on the skin are based on synthetics with a straight chain of great length and less polar hydrophilic groups than the electrolytically dissociated sulfonates. Synthetic detergents generally are not harmful to the skin and in certain cases are very mild on the skin. 243 references.

Concentration dependence of the electrophoretic mobility of soap micelles. D. Stigter(van't Hoff Lab., Utrecht, Neth.). *Rec. Trav. chim.* **73**, 771–82(1954). The dependence on the soap concentration of the micellar mobility is attributed primarily to a solvent backflow. The observed limiting slope is corrected for the change of the true micelle mobility, which is due to the variation in effective ionic strength with soap concentration. The corrected slope is interpreted in terms of a volume of solvent entrained by 1 g. of micellar soap. An approximate calculation confirms the experimental finding that the amount of entrained solvent became larger when the ionic strength of the solution decreased. (*C. A.* **49**, 2819)

Surface-active agents from petroleum. History and statistics. J. R. Skeen and F. D. Snell(F. D. Snell, Inc., New York). *World Petroleum Congr., Proc. 3rd Congr.*, Hague, 1951, Sect. V. 119–26. The increase in the production of surfactants derived from petroleum is shown by statistics. Data are compiled in a table for the years 1943–50. The history of the appearance on the market of each major type is reviewed including the green sulfonates and mahogany sulfonates. (*C. A.* **49**, 2759)

Comparative cleaning by diphase cleaners and alkaline salts. L. Osipow, H. Pine, Cornelia Snell, and F. D. Snell(F. D. Snell, Inc., New York). *Ind. Eng. Chem.* **47**, 845–7(1955). Selection of the proper metal cleaner for a given operation requires knowledge of the performance characteristics of the cleaner relative to the soil and washing conditions. Comparison was made between efficiencies of a diphase cleaner and alkaline salts in cleaning steel surfaces soiled with petrolatum, mineral oil, carbon black, and these materials plus stearic, oleic, or lauric acid. The alkaline cleaners did not differ in performance, even though pH values ranged from 9.1 to 11.7. Performance with the alkaline cleaners improved with an increase in wash temperature. The diphase cleaner gave substantially more soil removal at all temperatures. The soil most difficult to remove was that containing no fatty acids; the easiest to remove was that containing oleic acid.

Surface-active agents and antiseptics. Some observations concerning a soap ampholyte, N-2-(2-dodecylaminoethylamino)-ethyl glycine. M. T. Lhoest and A. Mirimanoff(Univ. Geneva, Switz.). *Schweiz. Apoth.-Ztg.* **92**, 713–19(1954). This new agent is compared with the anionic and cationic wetting agents from bacteriostatic, fungistatic, and enzymic viewpoints. (*C. A.* **49**, 3558)

Preparation and properties of perlauric acid. F. P. Greenspan, R. J. Gall, and D. G. MacKellar(Becco Chem., Buffalo, N. Y.). *J. Org. Chem.* **20**, 215–17(1955). Perlauric acid has been prepared in good yield by reaction of 90% hydrogen peroxide with molten lauric acid in the presence of a strong acid catalyst. The product was a white waxy solid, possessing good stability after recrystallization. On solution in alkali, the perlauric acid formed a germicidal soap with considerably enhanced bactericidal-fungicidal activity over the comparable sodium laurate, although somewhat less active than sodium peracetate. Methyl epoxystearate was formed in good yield on reacting perlauric acid with methyl oleate in chloroform solution, indicating the general applicability of perlauric acid to epoxidation-hydroxylation reaction, associated with peracetic acid.

Silicates as corrosion inhibitors in synthetic detergent mixtures. R. Getty, N. W. McCready and W. Stericker(Philadelphia Quartz Co., Philadelphia, Pa.). *ASTM Bull.* No. 205, TP 76–85 (1955). The object of the tests was to determine the degree of corrosion with some detergent solutions, and the degree of protection obtained by the addition of various amounts of various silicates. Tests were made with aluminum, zinc, copper, brass, nickel-silver, and several enamels. Results show that although most heavy-duty detergents now contain sufficient silicate to prevent the corrosion of aluminum, an increase would be desirable to reduce the corrosion of zinc and its alloys. Increased silicate content would also reduce the staining of brass and nickel-silver. Copper is unaffected by detergent solutions under normal washing conditions, but it may cause electrolytic corrosion when used with less resistant metals. Properly chosen enamels are very resistant to detergent solutions under operating conditions. The silicated detergents lessen any attack and loss of gloss.

Khakan fat (pilu oil) as a substitute for coconut oil in soap. J. S. Aggarwal(Natl. Chem. Lab., Poona, India). *Oils & Oilseeds J.* (India) **7**(4), 5–6(1954). The oil obtained from the seeds of *Salvadora oleoides* and *S. Persica*, both of which are native to India, contains large quantities of lauric and myristic acdis and could replace coconut oil in soap manufacture. (*C. A.* **49**, 4311)

Japanese industry of surface-active agents. Tsuneharu Chiba. *J. Oil Chemists' Soc., Japan* **3**, 222–5(1954). This industry continues to grow in Japan. The production in 1953 amounted to the following (in tons): anion agents—Turkey red oil 3,489, emulsifying oils 4,704, textile fats 3,004, scouring oil 586, detergents from higher alcohols 7,312, detergents from mineral oil 3,521, emulsifying oils from higher alcohols 5,039; cationic agents 597; nonionic agents 2,514; miscellaneous 1,642; making the total of 32,409 tons. A list of 29 makers of surfactants and textile soaps is included.

Soap industry in Japan. Masao Nonaka. *J. Oil Chemists' Soc., Japan* **3**, 220–2(1954). Statistics on the production, import, export, and consumption of soaps are given for 1934–35, 1951–53. Per capita consumption of soaps is only 2.2 kg. or about ⅕ of that of U.S.A. The raw materials for soaps are similar with those of U.S.A., consisting of 73–76% tallow (imported from U.S.A.), 15% coconut oil, and 9–15% other oils (including hydrogenated fish oils and palm oil).

Free-flowing surface-active agent in discrete-particle form. L. H. Jaquay(American Cyanamid Co.). *U. S. 2,702,818.* A dialkyl sulfosuccinate surface active agent is prepared in free-flowing, discrete particle form by coating pellets of dialkyl sulfosuccinates of aliphatic alcohols of five or more carbon atoms with a thin layer of a fine, dry powder of a dialkyl sulfosuccinate of an aliphatic alcohol of less than five carbon atoms.

Preparation of sulfonated alkyl aryl detergent slurries. J. J. Morrisroe(Purex Corp. Ltd.). *U. S. 2,703,788.* A sulfonated detergent slurry is produced by reacting a petroleum-derived aryl substituted alkane material having alkyl radicals containing from 8 to 18 carbon atoms with an anhydrous solution in sulfur dioxide of sulfuric acid containing between about 60 to 75% free sulfur trioxide (the mol ratio of free sulfur trioxide to the alkane material being between about 1.0 and 1.3 mols of sulfur trioxide to 1.0 mol of alkane), separating sulfur dioxide from the resulting substantially anhydrous sulfonic acid stock, and neutralizing the anhydrous stock so formed to produce a concentrated slurry.

Surface-active compositions. H. L. Sanders(General Aniline & Film Corp.). *U. S. 2,703,797.* An effective surface-active agent is prepared by condensing dehydroabietinyl primary amine with 4 to 10 moles of ethylene oxide by heating at a temperature from 120–180° in the presence of an alkaline-reacting catalyst.

Detergents from N-monoalkylglucamines. A. M. Schwartz(Commercial Solvents Corp.). *U. S. 2,703,798.* A detergent composition consists of the reaction products obtained by reacting an aliphatic ester of a fatty acid having from 6 to 30 carbon atoms with an N-monoalkylglucamine containing from 1 to 8 carbon atoms in its alkyl group in about equimolecular proportions at temperatures between about 140° to 230°.

Toilet soap and process of preparing same. R. F. Heald(Colgate-Palmolive Co.). *U. S. 2,704,279.* An improved and unbuilt milled toilet soap in bar or cake form useful in dispersing lime soaps consists of at least 60% of anhydrous water-soluble metallic salts of higher fatty acids with about 4 to 30% of water-soluble higher fatty acid monoglyceride monosulfate detergent uniformly dispersed throughout.