The β-lipoproteins possibly represent an example of this latter phenomenon. Many individuals placed on a diet containing large amounts of saturated fatty acids have an increase in low-density or β-lipoproteins. The high cholesterol content of this type of lipoprotein accounts in large measure for the elevation of serum cholesterol observed in these people. However, the explanation of this phenomenon lies outside our present-day knowledge and within the province of future research.

From the foregoing it is evident that understanding of fat transport is far from complete. Little is known about the structure of the lipoprotein molecule, how the protein is affixed to the lipide, why different proportions of the various lipides occur with each type; nor do we completely understand the functions of the different kinds of lipoproteins, how they are released or removed from the circulation, or the factors which regulate their concentrations in plasma. Research is hampered not only by a methodology still inadequate to cope with the complexities of fat chemistry but also by the variations in fat metabolism present between different species of experimental animals. Enlightenment in these difficult areas is essential to a more complete understanding of the body's fat transport mechanism.

Summary

The body uses several different mechanisms for the transport of fat in the aqueous medium of the blood. Fat is absorbed from the intestine in the form of chylomicrons, which are discrete particles, visible under the microscope. They consist primarily of triglycerides of the longer fatty acids. The chylomicrons are absorbed *via* the lymphatic system, which ultimately empties into the blood stream. They are rapidly removed from the blood by several tissues, which either oxidize the fatty acids, store them, or return them to the circulation incorporated in lipoproteins or bound to serum albumin. This latter mechanism of transporting fatty acids by binding them to albumin has recently been shown to be of great physiologic significance. Although the quantity of lipide so bound represents only a small percentage of the total serum lipides, it has a rapid turnover. The bulk of the serum lipides are carried as large lipoprotein molecules, of which there is a wide spectrum. Although several methods are now available for characterizing and quantitating these lipoproteins, little is known of their physiologic significance.

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

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• Oils and Fats

Autoxidation (of oils), volatile products and the role of antioxidants. N. A. Khan (Pakistan Council Sci. Ind. Research, Tejan, Dacca). *Oléagineux* 13, 331-5 (1958). Moisture was the sole volatile product during the initial 125 hours of autoxidation of methyl oleate at 75°. After 150 hours volatile organic material was formed. The hydroperoxides of methyl oleate and methyl linoleate were decomposed under vacuum at 150° for one hour and the volatile products collected in a capillary at low temperature. Infrared spectra showed the disappearance of *trans* absorption in the residue of methyl oleate and the appearance of *trans* absorption in the products from methyl linoleate. (*C.A.* 52, 12424)

New method for extracting oils with acetone and neutralizing them within the mixture. C. Vaccarino. *Oléagineux* 13, 233-6 (1958). The process involves extraction of oil with acetone and neutralization with sodium hydroxide while still in the micella stage. (*C.A.* 52, 12424)

Fractionation with superheated steam in the laboratory, with particular emphasis on the conditions for the separation of fatty acids. I. H. Stage, R. Bünger, and A. Jonas (Fa. Distillationstech. Dr. Hermann Stage, Cologne-Niehl, Ger.). *Fette u. Seifen* 55, 513-16 (1953). The theory and apparatus used are described. (*C.A.* 52, 12423)

Ethanol number as a new constant for oils and fats. L. Rozental (Akad. Med., Warsaw). *Acta Polon. Pharm.* 14, 95-9 (1957). Differential solubility of various oils and fats in mixtures of ethyl ether and ethyl alcohol was applied to their evaluation. A sample (5 g.) of the oil or fat is dissolved in 25 ml. of anhydrous ethyl ether, and titrated at 20° with 95% ethyl alcohol to a stable turbidity. The amount of ethyl alcohol in ml. used is proposed as a new characteristic, ethanol number. The method is not applicable to crude fats containing many alcohol insoluble contaminations. (*C.A.* 52, 12423)

Constants of the fatty acids from animal or vegetable oils—their use for identifying some esterified oils. L. Martarese. *Oléagineux* 13, 157-63 (1958). (*C.A.* 52, 12423)

Fractional separation of fatty acids. A. Fichoux. *Oléagineux* 13, 127-9 (1958). The batch, continuous, and semicontinuous systems for rectifying fatty acids are critically compared. (*C.A.* 52, 12423)

Molecular association in fat mixtures. D. G. Dervichian. *Oléagineux* 13, 113-17 (1958). A study was made of the variation of X-ray diagrams as a function of the composition of lauric acid-myristic acid, lauric acid-stearic acid, and lauric acid-palmitic acid mixtures. A definite correlation exists between the variation in the position and intensity of the bands observed and the variation of the melting point curves of the fatty-acid binary mixtures. The existence of molecular associations between fats, phosphatides, and cholesterol was evident. These associations are in simple molecular proportions and mainly in the presence of water. Molecular spacings were also detected which either correspond to each of the pure constituents or to their association. (*C.A.* 52, 12423)

Comparison of the influence of continuous and discontinuous heating on the stability of animal fats. A. Uzzan and R. Lobry (ITERG, Paris). *Rev. franç. corps gras* 5, 233-6 (1958). The course of the peroxide value of lard and tallow during storage at 60° is compared with samples stored similarly but whose storage is interrupted by daily heating periods. The heating reduces the amount of peroxides present but accelerates their development in subsequent storage. (*C.A.* **52**, 12422)

Neutralization of fats by fatty-acid distillation. L. Baroni. *Oléagineux* **13**, 65–7(1958). (*C.A.* **52**, 12421)

Infrared spectroscopy of fats. I. J. Lecomte. *Fette u. Seifen* **56**, 23–8(1956). (*C. A.* **52**, 12421)

Some applications of the determination of oxidized acids by chromatography. M. Burnet and P. Desnuelle(Fac. sci. Marseille, France). *Rev. franç. corps gras* **5**, 194–201(1958). Chromatographic technique is used to study development of oxidation products in fat. The saponification step used in analysis is innocuous. Oxy acids and peroxides develop during storage even if the fat is protected against light. In bleaching with sodium hypochlorite more oxy acids develop with 0.2–0.4% sodium hypochlorite at 75° than with 1.2% sodium hypochlorite at 40°, although the bleaching effect is nearly the same. Bleaching earths remove some of the oxy compounds. The presence of these oxidized products in soap-making fats induces excessive losses because in their removal in soap making they occlude nonoxidized soap. (*C.A.* **52**, 12422)

Colorimetric determination of peroxides in fats by the ferric thiocyanate method. C. Pietrzyk(Zakład Towaroznawstwa, Czestochowa, Poland). *Roczniki Państwowego Zakładu Hig.* **9**, 75–84(1958). The peroxide content was determined by treating a sample of 0.02–0.5 g. with 10 ml. solution containing 25 ml. methyl alcohol, 25 ml. chloroform, and 5 ml. solution A (5 g. ferrous ammonium sulfate hexahydrate or ferrous sulfate heptahydrate in 50 ml. water, 5 g. ammonium thiosulfate in 50 ml. methyl alcohol, 5 g. mercuric chloride in 25 ml. methyl alcohol, 25 ml. water, and 5 g. stannous chloride) shaking to dissolve the fat, and determining the peroxide content colorimetrically. This method was found to be sensitive to 0.2 microgram active oxygen in 1 ml. solution, but carbon dioxide decreased the values of oxidized fats. (*C. A.* **52**, 12421)

Catalytic conjugation of vegetable oils. J. Celikovsky and F. Kunertová. *Chem. průmysl* **7**, 381–5(1957). The optimum conditions for the catalytic conjugation of linseed oil using a nickel catalyst containing 35% nickel and 6% sulfur were 180° and 2% of nickel based on the amount of oil. Under these conditions about 40% of the double bonds are conjugated within 45–60 minutes. The activity of the catalyst is impaired by the unsaponifiables in the oil and decreases on reuse. (*C. A.* **52**, 13288)

Polar lipids in wheat flour. D. G. H. Daniels(Research Assoc. of British Flour-Millers, Cereals Research Sta., Old London Rd., St. Albans). *Chem. & Ind.* **1958**, 653–4. The purified polar lipids extracted from wheat flour showed five bands when chromatographed on silicic acid columns. The first four bands suggested fractionation of glycolipids. The last band seemed to be a lecithin. There is no evidence yet that this lecithin has any relationship to the bread making quality of flour.

Development and evaluation of potato chip bars. R. H. Treadway, J. R. Wagner, C. F. Woodward, E. G. Heisler, and R. M. Hopkins(Eastern Regional Research Lab., Philadelphia 18, Pennsylvania). *Food Technology* **12**, 479–82(1958). Potato chips crushed to ⅛ to ¼ inch on a side and compressed at 500 to 3,000 p.s.i. give self supporting bars in which the characteristic crunchy texture of the original chips is preserved. The oil loss is slight or nil if the chips are fried in hydrogenated shortening and compressed in an automatic press under optimum conditions. Chips fried in a vegetable oil-shortening blend have a more attractive flavor.

Seed oil of Asclepias. C. G. Gómez, F. G. y Gómez, and A. Swiatopolk-Mirski(Inst. J. C. Mutis de Farmacognosia, Madrid). *Farmacognosia*(Madrid) **18**, 83–8(1958). The seed oil from *Asclepias syriaca*, a rubber, bast fiber, and floss source, can be produced in such quantity and of such quality from cultivations on the high central Spanish plateau near Madrid as to indicate it as a valuable by-product. An average yield of 853 kg. of seed/hectare was obtained, with an average yield of 19% (by weight) of oil. This oil had the following constants: d_{15} 0.9232; n_D^{25} 1.4720; saponification value 186.4; iodine value 126.8; acetyl index 11.9; Reichert-Meissl number 0.48; Polenske index 0.29; free acids 2.53%. (*C. A.* **52**, 14198)

Composition of the seed fat of Cucumis melo. D. K. Chowdhury and R. Bagchi(Calcutta Univ., India). *Naturwissenschaften* **43**, 350–1(1956)(in English). The seed of *Cucumis melo* contains 30.8% fat. The oil extracted from the seed gave n^{25} 1.4669, saponification value 176.4, saponification equivalent 318.6, iodine value (Wijs 30 min.) 117.6, unsaponifiable matter 1.2%, free fatty acids (as oleic) 1.1%. The mixed fatty acids contain linoleic acid 59.94, oleic acid 16.98, and saturated acids 23.08%. (*C. A.* **52**, 14196)

The oils of various blubbers of northern sea elephant(Mirounga angustirostris). H. Tsuzuki(Univ. Nippon, Tokyo). *Sci. Repts. Whales Research Inst.*(Japan) **12**, 235–40(1957)(in English). The oils had the following values and compositions: d_4^{15} 0.9170–0.9275, n_D^{30} 1.4597–1.4650, saponification number 175.6–188.6, iodine number (Wijs) 90.4–140.9, solid acids 25.11–33.19, liquid acids 68.49–74.95, unsaponified matter 0.52–1.46%. (*C. A.* **52**, 15098)

Fatty oils of aquatic invertebrates. XV. Fatty oils of Palaemon nipponensis and Cambarus clarkii. T. Takagi and Y. Toyama (Univ. Nagoya). *Mem. Fac. Eng., Nagoya Univ.* **8**, 164–8 (1958). The characteristics of fatty oils extracted from *Palaemon nipponensis* and *Cambarus clarkii* were determined. The polyethenoid acids of the oils are characterized by comparatively large proportions of di- and trienoic acids. Linoleic acid was indicated in both oils. C_{20}-dienoic acid was present in the oil of *Cambarus clarkii.* Sterols of both oils consist chiefly of cholesterol.

XVI. Fatty oils of Cynthia roretzi and Pinna pectinata japonica, with a particular reference to their sterol components. T. Takagi, T. Maeda, and Y. Toyama. *Ibid.* 169–76. The fatty oils extracted from the fleshy portion of *Cynthia roretzi* and from the viscera of *Pinna pectinata japonica* have a comparatively high iodine number. The polyethenoid acids from *Cynthia roretze* oil contained penta-, hexa-, tetra-, di-, and triethenoid. Sterols from *Cynthia roretzi* oil contained a $\Delta^{5,7}$-sterol identical with 7-dehydrostigmasterol together with poriferasaterol and clionasterol. Sterol from *Pinna pectinata japonica* contained a $\Delta^{5,7}$-sterol of melting point 122–3° (acetate derivative melts at 120–2°) and clionasterol.

XVII. Fatty oils from echinoderms and mollusks with a particular reference to their sterol components. T. Takagi and Y. Toyama. *Ibid.* 177–82. The characteristics of fatty oils extracted from *Gorgonocephalus caryi, Luidia quinaria, Astropecten scoparius, Astropecten polyacanthus, Acanthochiton rubroilneatus, Cryptoplax japonica*, and *Liolophura japonica* were determined. Sterol components of *Gorgonocephalus caryi* were chiefly Δ^5-sterols, from which β-sitosterol was separated. Sterols of the other oils were chiefly of Δ^7-sterols. The $\Delta^{5,7}$-sterols are either absent or present in an extremely minor amount. The fatty acids of *Liolophura japonica* contain 27.4% of solid acids (iodine number 12.7). The polyethenoid acids of this oil ranged from diethenoid to hexaethenoid acids. The proportion of di- and triethenoid to tetra- and pentaethenoid acid was large as compared with the oils of common aquatic animals. (*C. A.* **52**, 15097)

Oleaginous seeds in Hungary. M. Jaky(Inst. Research on Vegetable Oils and Food Ind., Budapest). *Oléagineux* **13**, 149–51 (1958)(in German). The seeds of improved plant varieties are described. Sunflower seed is characterized by low hygroscopicity, good storage stability, 35–8% oil, 15–17% protein, and 60/40 kernel/shell ratio. The fatty acids comprise saturated 8–10, oleic 32–35, linolcic 56–60, and linolenic 1%. The oil contains 0.2–0.6% phosphatides, 0.7 unsaponifiable (mainly sitosterol), and 38–50 mg. % tocopherol. The new thornless castor seed has a 70/30 kernel/shell ratio and an oil content over 55%. The oil solidifies at −2 to −4° and is of good therapeutic quality; the oil cake, freed of toxin, is suitable as cattle feed. The linseed oil, similar to the La Plata variety, has an iodine number 170–190 and contains 40 mg. % tocopherol. The new pumpkin seed, almost free of shell, has over 50% oil, the oil is composed of 10% palmitic, 4 stearic, 42 oleic, and 44% linoleic acid, and contains 18 mg. % tocopherol and some chlorophyll. The tubers of *Cyperus esculentus*, air-dried, contains 20–24% oil. The oil is composed of 15 stearic, 70 oleic, and 15% linoleic acids. The new grape seed variety contains 11–12% oil (55% linoleic, 35% oleic, and 10% saturated acids). Other commercial products are tomato seeds (20–4% oil), rape seed, the soybean, and the perilla plant. Twenty-eight references. (*C. A.* **52**, 15096)

Composition of the oil from elecampane root. The unsaponifiable fraction. Cécile Collin-Asselineau and J. Asselineau(Inst. biol. physico-chim., Paris). *Bull. soc. chim. France* **1957**(11–12), 1356–64. The following compounds were isolated from the unsaponifiables of elecampane oil : a hydrocarbon, $C_{27}H_{56} \pm 2CH_2$, β-elemene, dammaradienol, stigmasterol, an alcohol, $C_{28}H_{48}O$. Phytomelane was shown to be in the soap solution during the saponification step. (*C. A.* **52**, 14197)

Properties of branched fatty acids. A. Metzger. *Fette, Seifen, Anstrichmittel* **60**, 178–84(1958). A lecture on surface tension, parachor, and molar refraction in relation to the structure of thirty C_{12}–C_{19} normal and iso fatty acids. (*C. A.* **52**, 14195)

Extraction of oil from oil seed with water. A. Dangoumau (Lab. Municipal, Bordeaux). *Rev. franç. corps gras* **5**, 245–51 (1958). Thoroughly crushing peanuts leads to a pulp from which consecutive extractions with water at ordinary temperature recovers up to 98% of the oil as a milky emulsion. Addition of surfactants to the water is not necessary since the emulsification of the oil is assured by the proteins and other substances present. However, breaking of the emulsion to recover clear oil is too difficult for industrial application of the process. (*C. A.* **52**, 14199)

New oil-refining technique with acetone. G. Cinquina. *Oléagineux* **13**, 99–100(1958). The oil is deacidified with sodium hydroxide, treated with 1.5-volume of acetone at 30°, filtered to remove residual soap, cooled to −5°, and the purified oil separated as the lower layer. The upper (acetone) layer contains oxyacids, lecithins, chlorophyll, and other impurities. The waxes are removed by filtration. (*C. A.* **52**, 15096)

Revalorization of the by-products of oil refining. II. Other by-products studied with the view of recovery of sterols. J. P. Sisley, A. Uzzan, and C. Trizis. *Rev. franç. corps gras* **5**, 307–15(1958). Modifications for the preparation of sterols from rapeseed oil gums were reported. (*C. A.* **52**, 15097)

Determination of antioxidants. V. I. Piul'skaya(All-Union Sci.-Research Meat Inst., Moscow). *Voprosy Pitaniya* **17**(1), 81–4 (1958). The literature is reviewed. Qualitative color tests and paper chromatographic determinations of butylated hydroxy anisole, nordihydroguaiaretic acid, α-tocopherol, and gallic acid and its derivatives (R_f values are given) are discussed. 12 references. (*C. A.* **52**, 14197)

Effect of various kinds of packaging on the durability of butter and lard. B. Sedláček, R. Rybín, and A. Tichá(Inst. Hyg., Prague). *Obaly* **3**, 132–4(1957). Samples of butter and lard, wrapped in parchment paper, either untreated or treated with quercetin, dihydroquercetin or quercetin and citric acid, were stored for five months at 5°. The treated parchment papers slowed down development of rancidity even in interior portions of the samples. Quercetin is recommended as being harmless to health. (*C. A.* **52**, 14885)

Changes in the oxidase activity in butter stored in wrappers impregnated with antioxidants. A. Hrabáková Zvoníčková(Packaging Research Inst., Prague) *Obaly* **3**, 144–6(1957). Quercetin, dihydroquercetin, quercetin and citric acid, and a whey extract were shown to inhibit the oxidases in soybean flour. Butter samples wrapped in untreated parchment, or with parchment treated with quercetin, with dihydroquercetin, or with quercetin and citric acid were stored at 20, 7, −7, or −20° for 7–168 days. The oxidase activity first decreased, then increased during storage, as the original butter oxidases declined and those from bacterial contamination rose. Antioxidants in the wrapping had no effect. (*C. A.* **52**, 14885)

L-Ascorbic acid as antioxidant of cocoa butter. G. Cerutti(Ist. Chemoterapico Ital., Milan). *Oléagineux* **13**, 95–7(1958). The peroxide number of cocoa butter remained unchanged after 18 months' storage at room temperature with 400 parts per million L-ascorbic acid. Lecithin (0.1%) and polyethylene glycol derivatives showed a limited antioxidant activity. The effectiveness of L-ascorbic acid is attributed to inhibition of the lecithinase. (*C. A.* **52**, 14888)

Colorimetry of fat products. I. Fatty acids. W. Weigel(II. Med. Univ. Klin. Charité, Berlin). *Pharmazie* **11**, 789–91 (1956). The colorimetric fatty-acid number indicates content of both free and combined acids and is, therefore, comparable with the saponification number; it is based on the extinction of 0.5 mg. fatty acid in a mixture of 6 ml. concentrated sulfuric acid and 0.5 ml. 10% aqueous formaldehyde (formaldehyde reaction) read in a layer 0.5 cm. thick with filter S43 (Pulfrich photometer). The formaldehyde reaction provides a quantitative fatty-acid determination and also a fairly precise characterization of small amounts of fatty acids; thus the necessity is avoided for conducting preliminary identification studies (as of splitting fats and isolating fatty acids).

II. Fat alcohols. *Ibid.* **12**, 357–63(1957). A colorimetric procedure is described by which can be determined the total alcohols and also the saturated, unsaturated, primary, secondary, tertiary, and iso-alcohols from propyl alcohol on up. The reagent used was *p*-dimethylaminobenzaldehyde as a 4% solution in 50% sulfuric acid. In the presence of glacial acetic acid, concentrated sulfuric acid acts on alcohols to produce unsaturated hydrocarbons through a dehydration process, the extent of reaction for various compounds depending on temperature and time. A color test was obtained by reaction of reagent used at the double bond of the hydrocarbon to produce orange to red compounds, which were measured colorimetrically with the Pulfrich photometer. Where there is a mixture of homologous alcohols, a colorimetric hydroxyl-number (colorimetric fatty alcohol number) determination can be used to determine average molecular weight, since chain length determines color characteristics. 17 references. (*C. A.* **52**, 14197)

Directed interesterification of menhaden oil(Brevoortia tyrannus). D. Martín, C. Boelhouwer, and R. I. Waterman. *Anales real soc. españ. fís. y quím.* (Madrid) **54B**, 147–50(1958). The structure of the oil is modified by a process of elaidinization, converting *cis*-ethylene radicals to the *trans* form which will have a higher melting point and which, subsequently during interesterification, will separate as a solid portion. Separation of this mixture shows widely different iodine values. Isomerization of the oil with liquid sulfur dioxide does not change the constants of oil, and there are no secondary transformations. Samples of both original oil and isomerized oil are interesterified directionally. The products are fractionally crystallized from four volumes of pentane. The constants and molecular weight of the fractions indicate that the liquid fractions have higher molecular weights and higher iodine values. The large differences in molecular weights is accounted for by the fact that the greater portion of monoethylenic acids present have a carbon chain of 18 or less. (*C. A.* **52**, 15097)

Paper chromatography of fatty acids. XXIV. H. P. Kaufmann and E. Mohr(Univ. Münster, Ger.). *Fette, Seifen, Anstrichmittel* **60**, 165–77(1958). The separation of fatty acid mixture by paper chromatography is standardized by impregnation of the paper with $C_{11}H_{24}$ in the presence of acetic acid, identification of the separated acids as copper salts by using potassium ferrocyanide as color intensifier. Ascending, descending, or horizontal development can be used. The latter is preferred. The most important single factor is the degree of impregnation, defined as the amount of nonpolar solvent in g./g. paper. Addition of acetone and acetyl cyanide reduces the time of development and permits the use of a higher temperature and increases R_f values and differences of the separation fatty acids. The system $C_{11}H_{24}$-acetone-propionic acid-water at low temperature (−30°) is best suited for separation of ''critical'' pairs of C_{14}–C_{20} fatty acids. (*C. A.* **52**, 14196)

Analysis of volatile acid mixtures by distillation. P. Jaulmes. *Parfums, cosmét., savons.* 1, 94–105(1958). Improvements of apparatus and graphic calculation for increasing the accuracy of the analysis of mixtures of fatty acids by distillation are reviewed. 30 references. (*C. A.* **52**, 14196)

Initiation reactions in the autoxidation of unsaturated fatty acids and esters. N. A. Khan(Council Sci. Ind. Research, Tejgaon, Dacca, E. Pakistan). *Oleagineux* **12**, 433–40(1957). Review and discussion of the mechanism of autoxidation and of the succeeding reactions. 30 references. (*C. A.* **52**, 14196)

Use of visible and ultraviolet spectrophotometry in industries concerned with fatty materials and their derivatives. J. P. Wolff. *Chem. anal.* **40**, 159–66(1958). Spectrophotometric methods for the determination of metals, antioxidants, oxidation products, and components in oils, fatty acids, and refined products are reviewed. (*C. A.* **52**, 14195)

Oil and fat technology. M. K. Schwitzer. *Chem. & Process Eng.* **39**, 153–6(1958). A review with 38 references. (*C. A.* **52**, 14195)

Removal of the odoriferous component of Helba oil and Helba seed. B. Flaschenträger and M. H. Aboul-Wafa(Univ. Alexandria, Egypt). *Fette, Seifen, Anstrichmittel* **60**, 184(1958). Extraction of a solution of Helba seed oil, 460 ml., in 1 liter of petroleum ether with 88% methyl alcohol, 990 ml., washing with water, drying and evaporating the petroleum ether gives 453 g. of an odorless, yellow-greenish oil, d_{19} 0.9175, acid number 3.0, saponification number 191.65, and unsaponifiable 3.5%, compared with 0.9416, 4.75, 190, and 3.1, respectively, for commercial Helba oil. (*C. A.* **52**, 14198)

Determination of the peroxide number. Kouroutzeff and Ouattara. *Rev. franç. corps gras* **5**, 226–9(1958). The methods of Lea, Sully, and Wheeler are investigated for certain deficiencies. Influence of size and sample, reaction time, and quantity of potassium iodide on the results is recorded with six different fats. The Wheeler method with slight modifications is recommended. (*C. A.* **52**, 14196)

Standards for technical cottonseed. Kh. Salimova and A. L. Markman. *Masloboĭno-Zhirovaya Prom.* **24**(3), 1–3(1958). Significant positive correlations were observed between the weight of 1,000 cottonseeds and their oil content, as influenced by the harvest and storage conditions, and between the weight of kernel/weight of hull ratio and the oil content. (*C. A.* **52**, 14198)

Fat determination in rape oil by the refractometric method versus the Soxhlet extraction method with ethyl ether. J. Janidki and Rutkowski (Univ. Poznan, Poland). *Przemysl Spożywczy* **6**, 451–5 (1952) (English summary). The main advantages of refractometric method with 1-chloronaphthalene are economy and rapidity (30 minutes) with an accuracy within 0.3–0.4%. A moisture content of 5–9% in the seed did not influence the accuracy of the determination. Extraction results with ethyl ether (Soxhlet) are 0.4% higher than that of the refractometric method. (*C. A.* **52**, 14198).

Extraction of neutral oil from soapstocks. M. Naudet and S. Bonjour (Fac. Sci., Marseille). *Rev. franç. corps gras* **5**, 252–3 (1958). Samples (100 g.) of peanut-oil soapstocks were dispersed in 1 : 1 aqueous ethyl alcohol, neutralized with sodium hydroxide, and repeatedly extracted with petroleum ether. The washed extract furnishes the neutral oil; the alcohol phase, after filtration of the impurities and acidification, the fatty acids. (*C. A.* **52**, 14199)

Configuration and properties of unsaturated acids and their derivatives. VIII. Reactivity of erucic and brassidic acids and their esters. A. K. Plisov and N. V. Bulatova (State Univ., Odessa). *Zhur. Obshcheĭ Khim.* **28**, 498–503 (1958). Erucic acid may be extracted conveniently from the hydrolyzate of rapeseed oil by treating the crude mixed acids with hot lead acetate in ethyl alcohol, separating the liquid portion of lead salts of saturated acids, which are not soluble in hot ethyl alcohol, and chilling the ethyl alcohol solution to 2–3°, yielding thereby a precipitate of lead erucate which on acidification yields the free erucic acid. Erucic acid and its esters are oxidized more rapidly by potassium dichromate than the corresponding derivatives of the brassidic acid family. Saponification of erucates proceeds more slowly than that of brassidates in alcoholic potassium hydroxide. Heating with hydrogen iodide to 110–15° for reduction experiments showed no isomerization of the acids and erucic acid is reduced more rapidly than brassidic acid. Erucic acid and its esters are hydrogenated over palladium more rapidly than the corresponding analogs in the brassidic acid family. The results indicate that erucic acid is the *cis* isomer and brassidic acid the *trans* isomer. (*C. A.* **52**, 14528)

Technology of edible oils and fats. Odor and taste removal (deodorization). E. Lipka (VEB Öl- und Hefewerk Velten, Berlin). *Nahrung* **1**, 179–87 (1957). (*C. A.* **52**, 14020)

Ozonization and decomposition of oleic acid and its methyl ester in glacial acetic acid. Gaku Izumi (Nagoya Kogyogijutsu Shikenjo). *Kgôyô Kagaku Zasshi* **59**, 1129–31 (1956). In the initial period of ozonization of oleic acid methyl ester, the amount of carboxyl is predominant, but it decreases sharply with the progress of oxidation which produces gradually more carbonyl radical. Ozonized oleic acid and oleic acid methyl ester were treated with hydrogen at 98 kg./sq. cm. and 150–69° for 2 hours in the presence of copper-chromium catalysts. The production of alcohols was indicated by infrared spectra. The reaction mechanism of ozonization was discussed. (*C. A.* **52**, 14530)

Rapid analysis of baking materials containing emulsified fats. F. Muntoni and A. Cesari. *Rend. ist. super. sanità* **20**, 979–86 (1957). A method for analysis of emulsified product containing fat and emulsifiers was given in detail. The method gave good results with lard emulsions prepared in the laboratory by using 2–4% of glyceryl monostearate as the emulsifier. (*C. A.* **52**, 14883)

The "volatile acidity ratio" of butter. C. Antoniani and A. Daghetta (Univ. Milan). *Oléagineux* **13**, 53–5 (1958). A new analytical method based upon the contents of volatile acids is reported as helpful in detecting adulterants in butter. (*C. A.* **52**, 14885)

The quality of oil extracted from sesame seeds and peanuts cultivated in Romania. H. Filipescu. *Analele inst. cercetări agron. Romăniei* **24**, 593–601 (1956). Oils extracted from sesame grown in certain provinces had satisfactory organoleptic properties and good resistance to autoxidation but a somewhat high free acidity. This shortcoming was circumvented by judicious storage of the seeds. Adequate peanut oil was obtained only when climatic conditions favored a good crop. (*C. A.* **52**, 14887)

The reaction of styrene with unsaturated fatty acid. E. Oelsner and K. Hamann (Forschungsinst. Pigmente and Lacke, Stuttgart, Ger.). *Fette, Seifen, Anstrichmittel* **60**, 189–97 (1958). The double bond of oleic acid was shown to have remained intact when it was heated with styrene in a nitrogen atmosphere for twenty-seven hours at 250°. (*C. A.* **52**, 15089)

Isolation of enanthaldehyde and undecylenic acid from castor oil fatty acids. E. Atanasova and M. Gardev. *Compt. rend. acad. bulgare sci.* **10**, 379–82 (1957). From pure castor oil, enanthaldehyde and undecylenic acid were obtained by passing its fatty acids through a copper tube, 25 mm. × 1 m., at 550°/360 mm. at 500 g./hour. 16–17% Enanthaldehyde and 26–27% undecylenic acid were obtained from castor oil. (*C. A.* **52**, 14529)

Miscibility of glycerol with different natural oils at different temperatures. R. Basu Roy Choudhury (Presidency Coll., Calcutta). *Sci. and Culture* **23**, 476–7 (1958). The miscibility of glycerol in oil depends upon temperature, molecular weight of the fats, and the unsaturation of the fat. Oils of comparable molecular weights yield similar results as shown by peanut and sesame oils. Coconut oil having lower molecular weight is more miscible with glycerol. The effect of unsaturation is not very marked. At higher temperature (in the range of 225°) solubility increases slightly with increase in unsaturation. (*C. A.* **52**, 15095)

Quantitative mass spectrometric analysis of mixtures of unsaturated and saturated fatty acids. B. Hallgren, E. Stenhagen, and R. Ryhage (Inst. Med. Chem. Univ., Uppsala, Swed.). *Acta Chem. Scand.* **11**, 1064–5 (1957). The mass spectrum of a mixture of the methyl esters of saturated and unsaturated fatty acids shows two series of peaks corresponding to the ionized hydrocarbon fragments and the acetaldehyde-containing fragments, with the latter dominating. The sensitivity coefficients of the parent peaks of the different esters are not the same and it is necessary to use empirical corrections or to run artificial mixtures. In a complex mixture it is not possible to distinguish between geometric and (or) positional isomers. (*C. A.* **52**, 15095)

Urea adducts of fatty acids. VII. Component fatty acids of peanut oil. T. N. Mehta, M. G. Kokatnur, and S. B. Dabhade (Univ. Nagpur). *J. Indian Univ. Soc. Ind. & News Ed.* **18**, 220–4 (1955). Fractionation of methyl esters of peanut-oil fatty acids by the decreasing solvent crystallization as previously described gives 5% lower linoleic acid than fractionation of the fatty acid-urea adducts by elution with ethyl alcohol. The loss may be due to oxidation on repeated heating. (*C. A.* **52**, 15096)

Ultraviolet spectrum of Greek olive oils. L. Ninnis and M. Barbili. *Prakt. Akad. Athēnōn* **31**, 97–108 (1956). Results are tabulated for ultraviolet spectra, index of refraction, and peroxide numbers on 47 samples of pure virgin olive oils, to detect adulteration by refined and rancid oils and vegetable products. Limits are defined in terms of specific absorption coefficient; at 270 millimicrons $E^{1\%}_{1\,\mathrm{cm.}} = 0.096\text{–}0.524$ and at 230 millimicrons $E^{1\%}_{1\,\mathrm{cm.}} = 2.0\text{–}5.0$ and n^{40} 1.4615–1.4630. (*C. A.* **52**, 15096)

Identification of paraffins by selective extraction. G. Koenig. *Fette u. Seifen Anstrichmittel* **60**, 269–72 (1958). The wax (20–3 g.) is extracted with methyl alcohol for 50 hours in a Soxhlet extractor, the residue dried and the extraction repeated with ethyl alcohol, petroleum ether boiling at 40–50°, n-C_6H_{14}, and n–C_7H_{16}. Thus, six fractions are obtained; their weight, index of refraction, solidification point, and molecular weights are determined. Characteristic curves are obtained by plotting molecular weight or solidification point against percentage composition, permitting identification of the type of wax. Examples of natural and synthetic waxes are given. (*C. A.* **52**, 15098)

The relation between the iodine number and refractive index of hydrogenated oil from Cololabis saira and Balaenoptera physalus. M. Takeda, Y. Amano, and Y. Toyama (Nagoya Ind. Sci. Research Inst.). *Nagoya Sangyô Kagaku Kenkyûjo Kenkyû Hôkoku* **10**, 68–9 (1957). The following experimental formula is suggested: *Coloabis saira:* $n^{50}_{D} = (1.4488 \pm 0.0002) + (0.000124 \pm 0.000002) \times$ iodine number; *Balaenoptera physalus:* $n^{50}_{D} = (1.4478 \pm 0.0001) + (0.000124 \pm 0.000002) \times$ iodine number. (*C. A.* **52**, 15098)

Carbonyl compounds in butter. I. Introduction and method. H. van Duin (Netherlands Inst. Dairy Research, Ede). *Neth. Milk Dairy J.* 12, 74–80 (1958). A logical procedure is pointed out for effective separation and identification of carbonyl compounds formed by lipide oxidation. The 2,4-dinitrophenylhydrazones are subjected first to partition chromatography for separation according to chain length. Fractions are then subjected to adsorption chromatography on zinc carbonate for further separation on the basis of difference in chemical characteristics. Carbonyl compounds were regenerated with oxalic acid-glyoxylic acid mixture and steam distillation.

II. Preliminary investigation into the autoxidation products of phosphatides from butter. *Ibid.* 81–9. 2,4-Dinitrophenylhydrazones of the volatile carbonyl compounds obtained from butter phosphatide oxidized at 13° and pH 4.6 were separated into 20 fractions in petroleum ether by partition chromatography with nitromethane on a silica column. About one-third of the compounds were of chain length 2–3 with a maximum amount at 3, one-half of 4–10 with a maximum at 6, and the rest of 10–18 with a maximum at 16 carbon atoms. Fractions were further separated by adsorption chromatography on zinc carbonate. Conjugated enals were mainly in the range 4–10 carbon atoms, some at 10–14 carbon atoms. Conjugated dienals were mainly at 5–6 carbon atoms, some at 13 carbon atoms. Small amounts of various ketones were distributed over all chain lengths. Aldehydes with 14–18 carbon atoms are probably formed from acetalphosphatides by hydrolysis.

III. Phosphatide-bound aldehydes. *Ibid.* 90–5. Butter phosphatide was hydrolyzed with 4% trichloroacetic acid in benzene at 70° in the presence of 2,4-dinitrophenylhydrazine. Ultraviolet absorption data of the dinitrophenylhydrazones indicated 0.4–0.8% of carbonyl compounds in the phosphatide, present as acetal phosphatides. Fractionation of the dinitrophenylhydrazones on a silica column with nitromethane as the stationary and petroleum ether as the mobile phase, showed aldehydes with 14–18 carbon atoms. Stearyl- and palmityl-aldehydes were identified. Indications were obtained for the presence of unsaturated and probably branched aldehydes. (*C. A.* **52**, 14884)

The separation of complex lipide mixtures by the use of silicic acid chromatography. J. Hirsch and E. H. Ahrens, Jr. (Rockefeller Inst., New York, N. Y.). *J. Biol. Chem.* 233, 311–320 (1958). A method is described for the separation of complex lipide mixtures into chemical classes by elution from a single column of silicic acid. The method has been tested by the separation of synthetic mixtures and the mixture of lipides found in human plasma. Some of the many possible applications are illustrated.

Cholesteryl esters of long-chain fatty acids. Infrared spectra and separation by paper chromatography. J. A. Labarrere, J. R. Chipault, and W. O. Lundberg (Univ. Minnesota, Austin, Minn.). *Anal. Chem.* 30, 1466–70 (1958). Certain cholesteryl esters are prepared and used to develop analytical procedures for separation and identification. Physical and spectral data are obtained for each ester. Separation of mixtures of saturated and unsaturated esters is by ascending reverse-phase paper chromatography using a two-solvent system.

Reactions of conjugated fatty acids. VII. Catalytic Cyclization and aromatization of cis,trans-octadecadienoic acid with selenium. H. M. Teeter, E. W. Bell and M. J. Danzig (Agricultural Research Service, U. S. Dept. of Agriculture). *J. Organic Chem.* 23, 1156–58 (1958). When *cis-trans*-conjugated methyl linoleate was heated at 250° with selenium, the product consisted of a mixture of isomeric *cis-* and *trans*-octadecenoates and cyclized material that appeared to be a mixture of dialkylbenzene and dialkylcyclohexene and could be converted to *o*-phthalic acid in 54% yield. In the presence of hydrogen acceptors, the ratio of octadecenoate to cyclic product was decreased. Results of a kinetic study suggest that the first step in the reaction is a rapid isomerization of *cis,trans*-conjugated methyl linoleate to the *trans,trans* isomer and that it is the latter that cyclizes.

Markets for soybean oil in Spain and Turkey. E. M. James (Soybean Council of America, Inc.). *Soybean Digest* 18(11), 36–8 (1958). In Spain, soybean oil is used primarily for blending with olive oil. Potential markets include margarine and protective coatings. In Turkey, where blending of oils is limited, the largest potential markets for soybean oil are for the production of margarine and ghee.

The world fats and oils supply situation. G. A. Parks (Foreign Agr. Service). *Soybean Digest* 18(11), 58–9 (1958). Sizes of oilseeds crops in various countries, and the possible production and prices of fats and oils during 1959 are discussed briefly.

Manufacture of improved doughnut sugar. G. J. Rosner (The Griffith Labs., Inc.). *U. S. 2,846,311.* A dusting sugar is prepared from dextrose, 3.5 to 9% fat, 0.3 to 1.5% kaolin, and 16 to 0% starch.

Process for preparing fluid shortening. C. W. Lantz, W. M. Cochran, and R. E. Lutz (The Glidden Co.). *U. S. 2,846,312.* A process is described for the preparation of a moderately uniform dispersion of fine crystals of the normally-solid glycerides components of the shortening in the normally-liquid oils. The critical stages in the process are the rapid chilling of the oil to initiate crystallization, followed by stirring for at least 48 hrs. at room temperature.

Manufacture of doughnut sugar. G. J. Rosner (The Griffith Labs., Inc.). *U. S. 2,846,315.* In a process for compounding doughnut sugar, a normally solid edible fat is plasticized by working. The remaining ingredients, including dextrose crystals, are then mixed with the fat.

Process for preserving the fresh natural flavor of butterfat and products produced therefrom. G. D. Turnbow (Foremost Dairies, Inc.). *U. S. 2,847,310.* A process is described for production of a recombined milk product containing anhydrous milk fat which has been heat treated and contains not more than four parts per million of sulfur.

Separation of saturated and unsaturated fatty acids. J. L. Ohlson and C. S. Steiner (Swift & Co.). *U. S. 2,847,433.* A process is described for the separation of saturated fatty acids containing stearic acid having improved color and color stability. A mixture of saturated and unsaturated fatty acids is reacted with an oxidizing agent selected from the group consisting of chromic acid, nitric acid, $KMnO_4$, peracetic acid, perbenzoic acid, and monoperphthalic acid. The desired saturated acids are then extracted from the reaction mixture with a liquefied normally gaseous hydrocarbon.

Purification of dodecanedioic and undecanedioic acids. T. R. Steadman and J. O. H. Peterson, Jr. (National Research Corp.). *U. S. 2,847,467.* A mixture of dodecanedioic, undecanedioic and stearic acids is dissolved in aqueous acetic acid. The oily phase is separated from the hot solution. A high purity mixture of dodecanedioic and undecanedioic acids separates as the clear acetic acid solution cools.

Method and apparatus for neutralizing fatty oils. J. Wijnberg (Akt. Separator). *U. S. 2,848,468.* A continuous process is described for the alkali refining of oil.

Anhydrous extraction of volatile fatty acids. Lambiotte & Co. *Belg. 512,427.* An aqueous solution of lower fatty acids is extracted with a volatile liquid which is a solvent for the acids and a nonsolvent for water. The extract is refluxed and a mixture of water and acid containing little volatile solvent and having a lower concentration of acid than the original extract is eliminated from the still at a location where the temperature is above the boiling point of the volatile solvent and is greater than 100°. (*C. A.* **52**, 15101)

Epoxy derivatives of acetylated castor oil and esters of acetylated recinoleic acid as plasticizers for poly(vinyl chloride). A. Koebner (Lankro Chemicals Ltd.). *Brit. 790,314.* Castor oil or esters of ricinoleic acid are epoxidized after acetylation of the oil or ester. The new compounds are useful as plasticizers for vinyl chloride polymers. (*C. A.* **52**, 15134)

Saturated products from natural or treated oils and aromatic compounds. Compagnie française de raffinage. *Fr. 55,404.* Natural oils with their double bonds, saturated by attachment of aromatic ring compounds show an increase in viscosity. To increase the viscosity further, a mixture of arylated oil and arylaliphatic derivatives of biphenyl is prepared. (*C. A.* **52**, 14200)

Saponified or unsaponified fatty acids from saccharifiable cellulose compounds. P. Creuzé, P. J. Malvezin, and L. Rignault. *Fr. 55,550.* Lactic or butyric acids are heated under pressure with glycerol to give the glycerides lactin or butyrin, respectively. The diglyceride $C_{27}H_{46}O_{12}$ is obtained by mixing the individual glycerides or heating the acid mixture under pressure. $C_{27}H_{46}O_{12}$ is a good lubricant. The acids are prepared from C_6 sugars using lactobutyrate fermentation with *Bulgaricus alginis* or *Bacillus alginis* of marine algae of other sources of cellulose. (*C. A.* **52**, 14200)

Glycol esters from glycol or glycerol and lower fatty acids. J. P. Malvezin and A. F. Delemer. *Fr. 55,592.* Alginic acid is autoclaved under 2500-kg. pressure for at least one hour. The product is similar to that obtained by refluxing glycol 1 and alginic acid 1 mole or by heating under 4-kg. pressure for at least one hour. The product is probably formed by self-esterification of alginic acid. It is unctuous, water-insoluble, unsaponifiable, and is used for lubrication of mechanical parts. (*C. A.* **52**, 14200)

Waxes. E. Berthold, H. Hoyer, and G. von Rosenberg (Farbwerke Hoechst A.-G. vorm. Meister Lucius & Brüning). *Ger. 940,603.* Waxes suitable for shoe polishes and floor waxes are mixtures of esters, e.g. with 1,3-butanediol, and soaps of C_{12}–C_{22} acids obtained by the chromic acid bleaching of mineral waxes. Besides calcium soaps, they also contain zinc, magnesium and aluminum soaps. The mixtures also contain soaps of technical fatty acid, e.g. of coconut oil and palm oil fatty acids. (*C. A.* **52**, 15101)

Wax composition for treatment of leather and floors. H. Rusitzka. *Ger. 941,510.* Wax-paraffin-solvent mixtures are emulsified with water by addition of an emulsifier and then separation from the emulsion in the form of homogeneous, fine flaky particles by addition of more water. The emulsifier should be the type used for "oil-in-water" emulsions. The eliminated flaky particles are separated from the aqueous phase and dried. Disinfectant and bactericidal additions can be added, e.g. thymol mixed with camphor. (*C. A.* **52**, 15101)

Lead salts of fatty acids. L. M. Kebrich (National Lead Co.). *Ger. 946,136.* (*C. A.* **52**, 13779)

Separation of straight-chain fatty acids from branched-chain or cyclic compounds by urea-adduct formation. A. Marzin. *Ger.* (East) *10,295.* The mixture of fatty acids obtained by oxidation of paraffins is freed from the high-molecular compounds with methyl alcohol at −10°, dissolved in methyl alcohol, and treated with urea; the adduct is separated at 0°. By stepwise addition of urea, the fatty acids can be fractionated, the higher molecular acids being precipitated in the first fractions. The adducts are treated with a small amount of water. The concentrated solution obtained is crystallized at −12° and the mother liquor is recycled for decomposition of further quantities of adduct. (*C. A.* **52**, 15101)

Fatty acids. A. Marzin. *Ger.* (East) *10,767.* Paraffins are oxidized and saponified. Then an amount of acid (sulfuric acid) not sufficient for decomposition is added. The precipitated fatty acids are isolated. After addition of further amounts of acid, fatty acids of lower molecular weight and higher-valent acids are precipitated. These are then separated by fractional distillation. (*C. A.* **52**, 15101)

Refining oils. Lal Bahadur Mathur and Rajeshwar Sahai. *Indian 56,859.* Oils containing thiocyanates are refined by precipitating the fixed thiocyanates, such as myrosin and sulfur-containing albumins present in the oils, by boiling with alum and removing the volatile thiocyanates by deodorization with steam and citric acid at 120°. Examples of oils which are refined by the above process are tara-mira oil from *Eruca sativa* and oils from various other crucifers. (*C. A.* **52**, 15101)

Purification of lanolin. Ryonosuke Masuda and Yasutsugu Tomioka (Kotovuki Chemicals Co.). *Japan. 9885('56).* Raw wool grease (100 g.) and 5 g. 10% sodium hydroxide solution are suspended in 150 g. water, 1 g. Raney nickel is added, and hydrogen passed in at 20 atmospheres at 100 for four hours to give purified lanolin. (*C. A.* **52**, 14200)

Stabilization of oil cake. Z. K. Lebedeva. *U.S.S.R. 110,416.* To preserve cake before extraction, the antioxidant Ionol (2,6-di-*tert*-butylmethylphenol) is used in an amount of 0.01% of the weight of fat in the cake. It is preferably added during roasting before pressing. (*C. A.* **52**, 14200)

Soap-stock fatty acids. A. L. Markman and A. S. Magdamov. *U.S.S.R. 110,686.* Before treatment, fatty acids from soap stocks are divided into two fractions, a solid and a liquid, by partly neutralizing them with alkaline earths or heavy metal oxides. (*C. A.* **52**, 14200)

FATTY ACID DERIVATIVES

Preparation and properties of vinyl fatty acids. A. Seher. *Fette u. Seifen Anstrichmittel* **58**, 1077–80 (1956). Preparation and properties of vinyl fatty acids, $CH_2{:}CH(CH_2)_nCOOH$, are described. The acids were prepared by one of the following methods: introduction of the carboxyl groups in an unsaturated compound having the desired chain length; generation of a double bond in a corresponding saturated acid; partial hydrogenation of a corresponding acetylenic acid. Comparison of the melting points of the pure vinyl fatty acids indicated that the acid having an even carbon atom number melts at higher temperature than the next higher acid having an odd carbon atom number. The vinyl fatty acids prepared reacted normally with hydrogen and bromine, but did not add the theoretical amount of HSCN. Thus, vinylpropionic acid added only 40%, the others about 60–70% of the theoretical amount of HSCN. (*C. A.* **52**, 14528)

Fatty acid-resin adsorption products. E. L. Gustus (R. J. Strasenburch Co.). *U. S. 2,841,526.* A composition for treating moniliasis is prepared by the adsorption onto a polyamine anion exchange resin of a fatty acid selected from the group consisting of C_7 to C_9 saturated fatty acids and C_6 to C_{11} unsaturated fatty acids.

Oxidation of ethylenically unsaturated fatty acids. C. S. Morgan and J. W. Walker (Celanese Corp. of America). *U. S. 2,847,431.* An oleic acid-containing mixture is dissolved in acetic acid and partially oxidized by air in the presence of a metallic catalyst. Most of the acetic acid is removed. The residual mixture is further oxidized with aqueous nitric acid. Finally, pelargonic acid and azelaic acid are isolated.

Production of chemicals. T. R. Steadman and J. O. H. Peterson, Jr. (National Research Corp.). *U. S. 2,847,432.* An alkyl ester of 12-ketostearic acid is oxidized with nitric acid in the presence of a mixed catalyst containing a copper compound and a vanadium compound.

12-Carboxyamido-11 or 12-octadecenoic acids and their esters. T. R. Steadman and J. O. H. Peterson, Jr. (National Research Corp.). *U. S. 2,847,455.* A process for the preparation of this class of compounds is described.

Alkaline oxidation of monoketomonocarboxylic acids. T. R. Steadman and J. O. H. Peterson, Jr. (National Research Corp.). *U. S. 2,847,466.* A process is described for the preparation of dicarboxylic acids from monoketostearic acid. The acid is reacted with an alkali metal hydroxide in the presence of water and cadmium oxide or zinc oxide at 300° to 375°. Dicarboxylic acids are recovered from the reaction mixture.

Fatty acid derivative. J. Nichols and E. S. Schipper (Ethicon, Inc.). *U. S. 2,848,467.* The product is 12-keto-9-octadecynoic acid.

Oxidation of castor oil. J. Nichols (Ethicon, Inc.). *U. S. 2,851,471.* A process is described for the oxidation of castor oil. A solution of castor oil in an inert organic solvent and a low molecular weight aliphatic or acyclic ketone is reacted with a low molecular weight aluminum secondary or tertiary alkoxide at temperatures below 115°. The predominant products are the glycerides of 12-keto-oleic acid.

Lead-catalyzed conversion of ricinoleic compounds. F. C. Naughton and P. C. Daidone (The Baker Castor Oil Co.). *U. S. 2,851,491.* Cleavage of ricinoleic compounds is achieved by heating a mixture of the ricinoleate, strong alkali and water in the presence of a catalyst selected from the group consisting of inorganic lead compounds and lead salts of organic acids.

Lead-catalyzed sebacic acid production in the presence of barium compounds. F. C. Naughton and P. C. Daidone (The Baker Castor Oil Co.). *U. S. 2,851,492.* In the preparation of a salt of sebacic acid, ricinoleate compounds are heated with water and a fluid alkali metal hydroxide containing a barium compound and an inorganic or organic lead salt.

Nickel-catalyzed sebacic acid production in the presence of barium compounds. F. C. Naughton (The Baker Castor Oil Co.). *U. S. 2,851,493.* Similar to U. S. 2,851,492. The preferred catalyst is nickel, an inorganic nickel compound or nickel salts of organic acids.

Higher fatty acid amides. É. Bauer (Établissements P. Barnier & Cie.). *Fr. 1,029,054.* Amides of fatty acids containing at least ten carbon atoms are prepared in high yield by heating the acid between 130–200° in the presence of ammonia, generated *in situ* from urea. (*C. A.* **52**, 13781)

Separation of synthetic fatty acid mixtures. W. Stein, H. Hartmann, and S. Knieschek (Henkel & Cie. G.m.b.H.). *Ger. 893,391.* Mixtures of synthetic fatty acids of higher molecular weight are separated into a mainly straight-chain and mainly branched-chain part by addition of organic compounds with at least five carbon atoms and subsequently squeezing out the liquid phase. A synthetic fatty acid mixture (C_{16}–C_{24}) (170 g.) is melted and mixed with 30 g. of mixed dibutyl ketone-butyl amyl ketone. The mixture is allowed to solidify overnight. The liquid portion is squeezed out at 21–23°/40 atmospheres to yield 59% solid residue, freezing point 58° after removal of ketone traces by steam. The salve-like product is suitable for making soap. (*C. A.* **52**, 14657)

Nitriles of aromatic fatty acids. F. Dengel (Knoll A.-G., Chemische Fabriken). *Ger. 903,931.* Nitriles are prepared by reaction of side-chain halogenated hydrocarbons with alkali cyanides in the presence of soluble alkali bromide. (*C. A.* **52**, 13775)

Long-chain carboxylic acids. H. Stetter and W. Dierichs. *Ger. 915,085.* Carboxylic acids with at least seven carbon atoms were prepared from dihydroresorcinol by substitution in the 2-position. These compounds gave α-oxocarboxylic acids by acid cleavage in 70–80% yield. Then the carbonyl was reduced to a CH_2 group by common methods. The whole preparation could be done in one stage if the C-alkylated dihydroresorcinol was reduced by the Wolff-Kishner method. In this case the acid cleavage was carried out in the presence of hydrazine. (*C. A.* **52**, 14689)

Freezing point-depressing agents for waxy hydrocarbons. Zenzaburo Sakurai (Nippon Fats and Oils Co.). *Japan 9985('56).* Aluminum stearate of technical grade (melts at 100–8° and chiefly distearate) (20 g.) is mixed with 6 g. technical lecithin and 100 cc. light oil. To a waxy hydrocarbon of freezing point 26–9.5° 1% of the above mixture is added and mixed at 60°. A depression of the freezing point of 17.5°–31.5° is observed. The addition of octadecylamine also gives good results. (*C. A.* **52**, 14200)

• Biology and Nutrition

Toxic effects of oil peroxides formed during fermentation. I. Horváth, K. Magyar, I. Gadó, J. Szántó and T. Vadkerty (Research Inst. of the Pharm. Ind., Budapest, Hungary). *Chem. & Ind.* **1958**, 916–7. In the course of the preparation of the special culture medium needed for the fermentation of oxytetracycline by *Streptomyces rimosus*, a toxic effect was observed. Present data indicated that peroxide formation in unsaturated oils as being connected with this toxic effect attributed to the presence of iron and other heavy metals, such as cobalt, in fermentation broth.

Effect of a fat diet on the efficiency of work. II. Effect of vegetable oil. S. Nagamine, T. Kuga, S. Kawada, K. Yamakawa, S. Oshima, and S. Suzuki. *Ann. Rept. Natl. Inst. Nutrition* (Tokyo) **1957**, 3–5. In experiments with three subjects on a treadmill, a high carbohydrate diet (calories: 80% carbohydrate, and 7% fat) was compared with a high fat diet (calories: 34% fat), where the fat was supplied by soybean oil. There was no difference in oxygen consumption per work performed. During the five days on the soybean diet, there was an increase in acetone bodies in the urine. (*C. A.* **52**, 14774)

Total lipides, conjugated unsaturated lipides, and lipoperoxides of human serum. I. Determination of total lipide and conjugated unsaturated lipides. E. Schauenstein, F. Wennig, and K. Kronegger(Univ. Graz, Austria). *Klin Wochschr.* **35**, 832–9 (1957). In normal subjects the diene and triene contents in total serum lipides were 5.67 and 1.43 mg. %, respectively, and these values were relatively constant despite large variations in total lipide content. In patients with carcinoma the values were essentially normal, while in liver disease the levels of conjugated lipide were elevated. (*C. A.* **52**, 13846)

The determination of serum cholesterol. Use of Liebermann-Burchard reagent in Zak procedure. L. G. Robinson and E. R. Pugh. *U. S. Armed Forces Med. J.* **9**, 510–16(1958). The Liebermann-Burchard reagent is applied to the Zak, *et al.* (*C. A.* **49**, 2034) procedure for determination of cholesterol. (*C. A.* **52**, 13838)

Total lipide, cholesterol, and phospholipide content of non-irradiated and irradiated skin of rabbits. H. P. Schwarz, L. Dreisbach, and A. Kleschick(Philadelphia Gen. Hosp., Philadelphia, Pa.). *Proc. Soc. Exptl. Biol. Med.* **97**, 581–3(1958). X-irradiation of rabbits with 4000–8000 r. had no significant effect on the skin lipides. Quantitative data on the different lipide fractions are given. (*C. A.* **52**, 13819)

Fat metabolism in experimental obesity. VIII. Blood total lipides and ketones in four kinds of obese mice. J. Mayer and D. J. Silides(Harvard Med. School, Boston, Mass.). *Experientia* **14**, 96–8(1958). While there are nonspecific results of hyperphagia and obesity such as elevated serum lipides, there are also profound differences between regulatory obesity, with its near normal metabolic pattern, and metabolic obesities with their abnormalities primary to the various syndromes, e.g. blood glucose picture, enzymic activities, hormonal patterns, cholesterol metabolism, and the increase in blood ketones after periods of fasting. (*C. A.* **52**, 13914)

Cortisone and lipide metabolism. Effects on serum lipoproteins of rabbits. U. Costa(Univ. Genoa, Italy), G. Ghigliotti, F. Astengo, and D. Azzena. *Arch. "E. Maragliano" patol. e clin.* **14**, 75–91(1958). By means of ultracentrifugation and paper electrophoresis, the lipoprotein changes in rabbit blood, as caused by cortisone, were studied. This treatment resulted in a significant increase of total lipoproteins, of low-density lipoprotein, and in the appearance of lipoprotein with very low density. No change was observed in lipoproteins with high density. (*C. A.* **52**, 13943)

Blood clotting after ingestion of vegetable fats. G. A. Cappelletti(Univ. Pavia, Italy) and A. Boatto. *Gazz. intern med. e chir.* **63**, 171–82(1958). The various blood clotting tests 3–6 hours after the ingestion of 100 g. vegetable fats (margarine) by normal individuals showed no considerable signs of hypercoagulability. (*C. A.* **52**, 13906)

Nutritive importance of fat in animal nutrition. R. Schreiber (Justus-Leibig-Univ., Geissen, Ger.). *Tierärztl. Umschau* **13**, 103–8(1958). A brief review on composition and importance of fats in animal nutrition. (*C. A.* **52**, 13904)

The effects of fats in sheep rations. J. R. Brethour, R. J. Sirny, and A. D. Tillman(Oklahoma Agr. Expt. Sta., Stillwater). *J. Animal Sci.* **17**, 170–9(1958). Five trials were conducted in which a total of 80 sheep were used to study the effects of dietary fats on growth, digestion, blood and urine ketone bodies, and intraruminal pH. Animal fat at a level of 15% of the ration significantly reduced digestibilities and weight gains. Additional mineral supplements depressed appetites and gains. Corn oil at 10% reduced gains and increased blood and urine ketone bodies. It did not seem to affect diurnal ruminal pH values. The addition of corn oil caused frothy foam in the rumen. (*C. A.* **52**, 13900)

Determination of total cholesterol in blood. Direct method. P. Kesselman. *Rev. asoc. bioquím. arg.* **22**, 107–9(1957). A colorimetric procedure is described by using aspirin, sulfuric acid, and acetic anhydride. Results compare well with alcoholic ethyl ether, alcohol or acetone extraction procedures. (*C. A.* **52**, 14734)

Preparation and properties of serum lipoproteins. K. Heidi, R. Schmidtberger, and G. Schwick(Behringwerke, Marburg a.d. Lahn, Ger.). *Behringwerk-Mitt.* **33**, 96–110(1957). Human serum lipoprotein was fractionated using density gradients adjusted with potassium bromide, α_2-, β-, and α_1-lipoproteins were isolated with a preparative ultracentrifuge at density = 1.019, 1.019–1.063, and 1.063–1.20, respectively. Peptide and lipide analyses showed differences between the three lipoproteins and incomplete carbohydrate analysis showed differences between β- and α_1-lipoproteins. Purity of the fractions was established by ultracentrifugal analysis, free and paper-supported electrophoresis, and agar diffusion tests. A close antigen relation exists between α_2 and β-lipoproteins. There is slight thrombokinase activity in the order β-$>$$\alpha_2$-$>$$\alpha_1$-lipoproteins. None of the proteins have any antithrombokinase, antithrombin, or heparin activity, and no effects as a heparin cofactor. α_1-Lipoprotein may have a slight antiheparin effect. (*C. A.* **52**, 14729)

Preparation in crystalline form from liver lipides of a substance active in growth. E. Tria and O. Barnabei(Univ. Ferrara, Italy). *Minerva med.* **1958**, 1763–5. A substance increasing growth of *Saccharomyces cervisiae* and of rats was found in liver lipides. It was isolated by hydrolysis with alcoholic barium hydroxide and adsorption on cellulose. The compound is shown to be a lipopeptide. (*C. A.* **52**, 14726)

Chemical changes in lipides in the aging human brain. M. Burger(Univ. Leipzig, Ger.). *Fette Seifen, Anstrichmittel* **60**, 253–9(1958). A lecture. (*C. A.* **52**, 14793)

The effect of lecithin on the organism. B. I. Yanovkaya and L. Ya. Solov'eva. *Voprosy Pitaniya* **17**(1), 46–9(1958). Feeding of lecithin in lard to white rats increased the body weight and decreased the ascorbic acid content in the brain and cardiac tissues; a small decrease of the ascorbic acid in other internal organs was also observed. (*C. A.* **52**, 14787)

Effects of different dietary fats and of choline on hepatic and serum lipides of rats. C. H. Best, C. C. Lucas, J. M. Patterson, and J. H. Ridout(Univ. Toronto). *Can. J. Biochem. and Physiol.* **36**, 613–23(1958). The effects in young male rats of ten edible oils and fats on total hepatic lipides and serum cholesterol were compared in the presence of various amounts of dietary choline. There was a negligible difference in the tendency for different fats to cause deposition of total hepatic lipides, although sunflower seed oil produced less accumulation at lower dosages of choline than did the others. No significant differences were found in the total cholesterol of serum of rats fed the different fats. The decrease in serum cholesterol that occurs in the absence of dietary choline did not appear to be influenced by the nature of the dietary fat. (*C. A.* **52**, 14785)

Dietary fat, serum-cholesterol levels, and incidence of atherosclerosis and hypertension in Delhi. S. Padmavati, S. Gupta, and G. V. A. Pantulu(Lady Hardinge Med. Coll., New Delhi). *Indian J. Med. Research* **46**, 245–60 (1958). In a survey of 566 rural and 486 industrial workers in Delhi, there was no correlation between serum cholesterol levels and dietary fat or dietary cholesterol intake. Serum cholesterol levels increased with age, but the rise was gradual. (*C. A.* **52**, 14783)

Nutritional efficiency of used fat and oil. Tani Hashimoto. *Ann. Rept. Natl. Inst. Nutrition*(Tokyo) **1957**, 95–7. Soybean oil and lard heated to 180° for six hours, and used cooking oils when fed to rats showed similar weight gains over 30 and 140 days, and no differences in absorption of the fat. (*C. A.* **52**, 14776)

On the absorption rate of rice bran oil in human subjects. E. Tamura, N. Matsuno, and K. Morimoto. *Ann. Rept. Natl. Inst. Nutrition*(Tokyo) **1957**, 45. Four subjects were fed a control diet supplemented with 55 g. of rice bran oil. An average of 97.0% of the rice bran oil was absorbed. (*C. A.* **52**, 14775)

Abnormal fat transport. W. S. Hartroft(Washington Univ. School of Med., St. Louis, Mo.). *Diabetes* **7**, 221–7(1958). The pathological basis of acute or chronic fat embolism is abnormal fat transport although clarification does not exist in certain degenerative vascular diseases such as atheroma, mycocardial infarction, diabetic retinopathy. (*C. A.* **52**, 13960)

Serum triglycerides in health and diabetes. Margaret L. Albrink and Evelyn B. Man(Yale Univ.). *Diabetes* **7**, 194–200 (1958). Lipides in serums of controlled diabetic patients are normal. With lack of control, the elevation and concentration of triglycerides (neutral fat or the differences between total fatty acids and the sum of fatty acids esterified with cholesterol or combined in phospholipide molecules) is of greater magnitude than are the increases of cholesterol or phospholipide; with triglycerides influencing the concentration and physical state of other lipide components. An interrelation between triglycerides concentration and carbohydrate metabolism is demonstrable. (*C. A.* **52**, 13960)

Possible connections between lipides and proteins of serum. D. G. Dervichian. *Koninkl. Vlaam. Acad. Wetenschap., Letter, en Schone Kunsten Belg., Kl. Wetenschap., Intern. Colloq. Biochem. Problem. Lipiden, 3, Brussels,* **1956**, 21–34. (*C. A.* **52**, 13931)

Colloidal aspects of blood lipides. H. L. Davis. *Ibid.* 81–93. (*C. A.* **52**, 13932)

Occurrence of tri-, di-, and monoglycerides in human serum. L. A. Carlson and L. B. Wadström. *Ibid.* 123–35. (*C. A.* **52**, 13932)

Albumin-fatty acid complexes. P. May. *Ibid.* 168–72. (*C.A.* **52**, 13931)

Action of the clearing factor upon a lipemic plasma. Displacement of fatty acids. C. Frayssinet and P. May. *Ibid.* 180–4. (*C. A.* **52**, 13932)

Antilipemic activity of heparin degraded in alkaline medium. J. Chaveau and Ch. Frayssinef. *Ibid.* 185–9. (*C. A.* **52**, 13932)

Effects of large fat intake on the physical state of the blood. R. L. Swank. *Ibid.* 216–23. (*C. A.* **52**, 13904)

The physical chemistry of lipoprotein transformation. F. T. Lindgren, N. K. Freeman, A. V. Nichols, and J. W. Gofman. *Ibid.* 224–42. (*C. A.* **52**, 13932)

Heparin and lipide transport. J. J. Spitzer *Ibid.* 243–54. (*C. A.* **52**, 13933)

Evidence for the participation of lipoprotein lipase in the transport of chylomicrons. R. J. Havel *Ibid.* **265–73.** (*C.A.* **52**, 13933)

Electrophoresis study of the chylomicron and the clearing factor. C. B. Weld. *Ibid.* 274–7. (*C. A.* **52**, 13934)

Ultracentrifugal, electrophoretic, and chemical changes produced in serum and artificial lipide emulsions by human clearing factor. A. Fasoli, F. Salteri, G. Spina, and G. Ratti. *Ibid.* 278–90. (*C. A.* **52**, 13934)

The interaction of chyle, cholesterol, and plasma. D. S. Robinson, J. E. French, and P. M. Harris. *Ibid.* 298–310. (*C. A.* **52**, 13935)

Some effects of carbohydrate feeding on lipide transport in the rat. J. H. Bragdon. *Ibid.* 338–46. (*C. A.* **52**, 13936)

Circulating human endogenous lipoprotein lipase(heparin lipemia-clearing factor). H. Engelberg *Ibid.* 367–38. (*C. A.* **52**, 13936)

The clearing reaction and blood coagulation. J. C. F. Poole. *Ibid.* 379–91. (*C. A.* **52**, 13936)

Cholesterol and other lipide synthesis in the perfused calf aorta. N. T. Werthessen, J. W. Hahn, and M. A. Nyman. *Ibid.* 401–8. (*C. A.* **52**, 13936)

Relations between blood lipides and blood picture. F. Leupold. *Ibid.* 409–15. (*C. A.* **52**, 13937)

Effect of phosphatides on toad heart. III. The action of phosphatides in calcium-low Ringer solution. T. H. Chu, K. S. Chao, and C. W. Meng(Peking Med. Coll., Peking). *Shêng Li Hsueh Pao* **19**, 155–61(1954). By continuous perfusion with calcium-free Ringer solution, the activity of the hypodynamic toad heart may be augmented with certain phosphatides or soaps e.g. crude soybean phosphatides, crude egg yolk phosphatides, and sodium or ammonium oleates.

IV. The action of phosphatides in potassium and acetylcholine inhibition. T. H. Chu and K. S. Chao. *Ibid.* 163–72. Soybean phosphatides, sodium oleate and rabbit serum are capable of reviving the contractility of toad heart inhibited by high potassium ion concentration and acetylcholine.

V. The effect of phosphatides and glucose on the hypodynamic toad heart at higher temperatures(22–30°C.). *Ibid.* 305–10 (1955). Soybean phosphatide strengthened the contraction of toad heart during first 2–3 hours of perfusion, but not after 5–10 hours when the contraction of the heart was exhausted. The contractility of the heart recovered when glucose was added and was best at 27–30°. (*C. A.* **52**, 13911)

Fate of triglycerides and phospholipides of lymph and artificial fat emulsions: disappearance from circulation. Esther L. McCandless and D. B. Zilvermit(Univ. of Tennessee, Memphis). *Am. J. Physiol.*, **193**, 294–300(1958). Artificial fat emulsions labeled in either triglyceride or phospholipide component were administered to unanesthetized normal dogs to determine the disappearance rates of the two lipides from the circulation. Similar experiments were carried out with lymph from donor dogs fed I^{131}-triolein or P^{32}-phosphate with unlabeled triglyceride. Triglycerides were rapidly removed from the circulation whether administered as an artificial fat emulsion or as a physiological emulsion, lymph. The emulsifying agents, liver lecithin or lymph phospholipide, required several hours for removal from the circulation. Evidence is presented that the slow disappearance rate of chylomicron phospholipides cannot be accounted for by exchange with plasma lipoproteins and indicates a slow removal of chylomicra phospholipide from the circulating blood. (*C. A.* **52**, 13038)

Volatile fatty acid growth factor for cellulolytic cocci of bovine rumen. M. J. Allison, M. P. Bryant, R. N. Doetsch(Dairy Cattle Res. Branch, U. S. Agr. Res. Serv., Beltsville, Md., and Dept. of Microbiol., Univ. Md., College Park, Md.). *Science* **128**, 474–5(1958). It has been shown that certain volatile fatty acids present in rumen fluid are required by a rumen bacterium. A mixture of acetate, propionate, *n*-butyrate, isobutyrate, *n*-valerate, isovalerate, DL-α-methyl-*n*-butyrate, and *n*-caproate in proportions similar to those found in rumen fluid supported growth of strain C-94 when it was added to the basal medium. Deletion of acetate from the mixture resulted in a marked increase in the incubation time required to reach maximum growth.

Performance data and flavor evaluation of broilers fed diets containing varying amounts of animal fat. G. H. Arscott(Dept. of Poultry Husbandry, Oregon State College, Corvallis) and Lois A. Sather. *Poultry Sci.* **37**, 844–850(1958). A significant improvement in growth was evident from the addition of 3 and 6 per cent fat to the all-corn ration. With 9 per cent fat, growth was adversely affected. A consistent but non-significant improvement in feed conversion was noted when 3, 6 or 9 per cent fat was added to the all-corn ration. When barley replaced one-half the corn, feed consumption was markedly increased. A significant improvement in feed conversion and growth was noted when 6 per cent fat was added to the ½ corn-½ barley ration with this treatment comparing favorably to the all-corn control. Adverse feathering was consistently observed when 9 per cent animal fat was used with the all-corn ration.

Cholesterol metabolism in scorbutic guinea pigs. S. Banerjee and H. D. Singh(Dept. Physiol., Presidency College, Calcutta, India). *J. Biol. Chem.* **233**, 336–339(1958). Total body cholesterol content increased in scorbutic guinea pigs in comparison with normal controls. Prolonged treatment of the scorbutic animals with insulin lowered the cholesterol content to the normal level. Although both total and ester cholesterol content of adrenal and spleen diminished in scorbutic guinea pigs, cholesterol content of intestine increased and there was no change in that of blood, liver, and kidney. Insulin treatment of the scorbutic animals had no effect on the cholesterol content of tissues studied, except that of the intestine, which was lowered to the normal level.

Effects of the esterification of supplemental cholesterol and sitosterol in the diet. M. M. Best and C. H. Duncan(Univ. of Louisville School of Medicine, Louisville, Kentucky). *J. Nutrition* **65**, 169–181(1958). Serum and liver cholesterol levels of rats were determined at the end of 14 days' maintenance on the following diets: low cholesterol, 1% cholesterol, and equivalent amounts of cholesteryl acetate, benzoate, palmitate, stearate and oleate. The liver cholesterol in the animals fed free cholesterol, cholesteryl acetate and cholesteryl oleate was significantly elevated as compared to the other groups. The cholesteryl benzoate, palmitate and stearate resulted in only minimal elevation of liver cholesterol as compared to low cholesterol diet. The increment in liver cholesterol was almost entirely in the ester fraction, without regard to whether the cholesterol add to the diet was free or esterified.

The absorption of fats studied in a patient with chyluria. II. Palmitic and oleic acids. R. Blomstrand and E. H. Ahrens, Jr. (Rockefeller Inst., New York, N. Y.). *J. Biol. Chem.* **233**, 321–327(1958). Carboxyl labeled oleic and palmitic acids were fed as free acids and as triglyceride esters to a patient with chyluria, and the incorporation of these acids into the various lipide classes of the lymph was followed. Oleic acid was transported via the lymphatic pathway and incorporated into triglycerides, phospholipides, and nonesterified fatty acids to the same extent as palmitic acid. Chyle triglycerides constituted the main transport form of both oleic and palmitic acids (about 90 per cent of the total amount of isotope in the lymph). About 3 to 9 per cent of the isotope was incorporated into the phospholipides and 1 to 7 per cent in the nonesterified fatty acids.

Absorption of fats studied in a patient with chyluria. III. Cholesterol. R. Blomstrand and E. H. Ahrens, Jr.(Rockefeller Inst., New York, N. Y.). *J. Biol. Chem.* 233, 327–330(1958). The absorption of dietary cholesterol-4-C^{14} has been tested in a patient with chyluria who shunted 40 per cent of absorbed dietary fat into her urine. Whether given with or without fat, about 20 per cent of the administered cholesterol was absorbed in 15 hours. The peak of labeled cholesterol absorption occurred at 9 hours, that of fat absorption 3 hours earlier; 60 to 80 per cent of the cholesterol in the chyle was in the esterified form. Cholesterol absorption was reduced about 50 per cent by the simultaneous administration of β-sitosterol. Under various conditions of fat intake, 1 to 3 gm. of cholesterol were transported each day from the intestine to the blood stream via the chyle: the greater the fat intake, the larger the pool of recirculated cholesterol.

The retention of fluoride by the skeleton, liver, heart and kidney as a function of dietary fat intake in the rat. W. Buttner and J. C. Muhler(Dept. of Chemistry and School of Dentistry, Indiana Univ., Bloomington, Indiana). *J. Nutrition* 65, 259–266(1958). The effect of feeding different dietary fats at a 5 and 20% level in the presence or absence of fluoride has been studied in order to determine if either the amount or type of fat is associated with increased retention of fluoride in the skeleton, liver, heart and kidney in the rat. Increasing the dietary fat from 5 to 20% results in more fluoride retention in the whole carcass, femur and soft tissues when 2 mg. of fluoride is fed daily. Neither the dietary fats nor the presence of the fluoride at the levels used in these studies was associated with a decrease in body weight gain.

Effect of diethylstilbesterol pelleting, dietary fat level and C/P ratio on growth, feed requirements and quality of turkey fryers. G. F. Combs, N. V. Helbacka and G. L. Romoser(Dept. of Poultry Husbandry, Univ. of Maryland, College Park). *Poultry Sci.* 37, 855–862(1958). The implantation of turkey fryers with 15 mg. of diethylstilbesterol in pellet form significantly increased the rate of gain and total fat deposition over their respective controls. Quality observations on fryers receiving rations containing 10% added fat did not reveal any significant differences over their respective controls which were fed rations containing 2% added fat, although growth rate was improved and feed requirement was decreased when 10% fat was included in their rations.

The relation of serum xanthophyll in chickens to the pigmentation of their shanks. P. N. Davis and F. H. Kratzer(Dept. of Poultry Husbandry, Univ. of California, Davis). *Poultry Sci.* 37, 851–854(1958). The level of serum xanthophyll of chicks fed a low pigment ration for 1 week and a test ration for one week is highly correlated with the degree of pigmentation of the shank after 3 or 4 weeks of feeding.

The uptake of lipoproteins by ascites tumor cells. The fatty acid-albumin complex. Dorothy L. Fillerup, J. C. Migliore and J. F. Mead(School of Medicine, Univ. of California, Los Angeles). *J. Biol. Chem.* 233, 98–101(1958). The absorption of palmitic acid-1-C^{14} by ascites tumor cells was studied *in vitro*. Palmitate was metabolized more rapidly from its albumin complex than from buffer alone, but the albumin carrier was not absorbed or metabolized. Cyanide-inhibited cells absorbed palmitate from the medium but did not metabolize it. The process of absorption was thus revealed as a distribution of fatty acid between the medium and the inert cell surface probably followed by an active transfer of the fatty acid into the cell for oxidation.

Regulation of hepatic lipogenesis: The influence of dietary fats. R. Hill, J. M. Linazasoro, F. Chevallier, and I. L. Chaikoff (Dept. Physiol., Univ. California School of Med., Berkeley, Calif.). *J. Biol. Chem.* 233, 305–310(1958). Rats were fed, for 3 days, synthetic diets containing 0, 1, 2.5, 5, 10, and 15 per cent fat. The fats tested included lard, corn oil, vegetable oil, and hydrogenated vegetable oil. The glucose content of each diet, regardless of its fat content, was kept constant, namely, at 50 per cent. The livers of rats fed the diet devoid of fat had the highest capacity for converting acetate carbon to fatty acids. A measurable depression in lipogenesis was observed when as little as 2.5 per cent was added to the diet. When the fat content of the diet was increased to 15 per cent, the liver had lost about 90 per cent of its ability to convert acetate carbon to fatty acids. All fats tested were effective in reducing hepatic lipogenesis. Similar effects were observed when labeled glucose served as substrate. These effects of ingested fat upon hepatic lipogenesis occurred in the absence of changes in (a) the glycogen and fat content of the liver and (b) the glucose and lipide content of plasma. The administration of insulin failed to increase the depressed hepatic lipogenesis induced by fat feeding.

Association of vitamin A ester and vitamin A alcohol with proteins in rat liver. S. Krishnamurthy, S. Mahadevan and J. Ganguly(Dept. of Biochemistry, Indian Institute of Science, Bangalore 3, India). *J. Biol. Chem.* 233, 32–36(1958). Normal stock male rats were bled to death and the residual blood in the liver was removed by perfusion with physiological saline. The livers were homogenized in 0.25 *M* sucrose solution, and the supernatant fluids obtained therefrom, when treated with various protein precipitants, yielded all the vitamin A in the precipitate. Treatment with various protein denaturing agents made all the vitamin extractable with diethyl ether but there were differences in the relative extractabilities of vitamin A ester and vitamin A alcohol after treatment with sodium salicylate or ethanol at room temperature.

The turnover of squalene in relation to the biosynthesis of cholesterol. A. V. Loud and Nancy L. R. Bucher(Massachusetts General Hospital, Boston, Massachusetts). *J. Biol. Chem.* 233, 37–41(1958). The dynamic relations between squalene and cholesterol in rat liver have been investigated both *in vivo* and *in vitro* during the biosynthesis of cholesterol from acetate-1-C^{14} and from tritum-labeled water. Turnover rates in hepatic squalene indicate a metabolic separation of this compound into relatively active and inert components. The active component has been demonstrated to become labeled prior to cholesterol, to possess a rate of turnover sufficiently rapid to function as a precursor of cholesterol, and to constitute no more than a small fraction of the total hepatic squalene.

Kidney changes in vitamin E-deficient rats. T. Moore, I. M. Sharman and K. R. Symonds(Dunn Nutritional Lab., Univ. of Cambridge and Medical Research Council, Cambridge, England). *J. Nutrition* 65, 183–198(1958). Rats were kept on diets deficient in vitamin E, with or without supplements of tocopherol and containing various fats, for prolonged periods. They were then killed, and histological sections were made from their kidneys. By comparison of sections from kidneys in which fixation had been prompt or delayed the role of autolysis in producing the typical histolysis in the cortical tubules, indicative of vitamin E deficiency, was confirmed. Post-mortem renal histolysis was prevented by the administration of adequate weekly supplements of *dl*-α-tocopherol acetate, irrespective of the nature of the dietary fat. The addition of methylene blue to the diet also prevented histolysis.

Effect of increased protein level in the hen diet on the transfer of gossypol-cephalin to the egg. R. Narain, C. M. Lyman and J. R. Couch(Dept. of Poultry Science and Biochemistry and Nutrition, Texas Agricultural Experiment Station, College Station, Texas). *Poultry Sci.* 37, 893–896(1958). A study was made to determine the effects of increased protein levels in the diet of White Leghorn hens on the transfer of gossypol-cephalin to the eggs. The protein level was increased from 17.5% to 35%. Free gossypol was incorporated in the diets at 0.0025%, 0.005% and 0.01% levels in the form of pigment glands. In one experiment in which fish meal was used to raise the protein level, a reduction in gossypol-cephalin transfer to eggs was evident at all levels of free gossypol. In the second experiment in which soybean oil meal was used to raise the protein level, no difference was found in amounts of gossypol-cephalin between the groups fed the two different protein levels at the same level of gossypol.

Mechanism of cholesterol absorption. II. Changes in free and esterified cholesterol pools of mucosa after feeding cholesterol-4-C^{14}. L. Swell, E. C. Trout, Jr., J. R. Hopper, H, Field, Jr. and C. R. Treadwell(School of Medicine, The George Washington Univ., Washington, D. C.). *J. Biol. Chem.* 233, 49–53 (1958). Lymph fistula rats were given a test meal containing 40 to 44 mg. of cholesterol-4-C^{14}. Lymph, the whole intestine, or segments of the intestine were analyzed at various times for free and esterified cholesterol chemically and by C^{14}-measurements. There was considerable endogenous dilution of the fed cholesterol-4-C^{14} in its transfer from the lumen to the lymph; this dilution occurred in the intestinal wall. The present study has provided evidence that a metabolic pool of free cholesterol exists in the intestinal mucosa. The existence and turnover of this pool has made it possible to explain certain aspects of cholesterol absorption and also to postulate a mechanism of absorption.

Diet and atherosclerotic disease. III. Epidemilogic findings. J. Stamler (Cardiovascular Dept., Medical Research Institute, Michael Reese Hospital, Chicago). *J. Am. Dietet. Assoc.* 34, 929–34(1958). Data are reviewed which indicate that significant atherosclerosis is rare in nations whose diet over the life span of individuals is predominantly vegetarian and low in total calories, total lipids, saturated fats and cholesterol. There seems to be a correlation between diet, plasma cholesterol-lipid-lipoprotein levels and atherogenesis.

Methods of using fatty acids to remove nematodes from livestock. A. C. Tarjan, V. J. Yates and J. L. Holmes (Mallinckrodt Chemical Works). *U. S. 2,846,351.* Nematode infected livestock are treated by administration of a nematoxic dose of C_7 to C_{11} aliphatic acids.

Process for recovering carotene. H. M. Barnett, M. L. Hartmann, R. C. Mosher and H. M. Espoy. *U. S. 2,848,508.* Carotenoids are precipitated from vegetable juice in the presence of an inert carrier, and are recovered by extraction with a cold, water-immiscible solvent.

Animal feed emulsion. R. H. Bedford. *U. S. 2,851,357.* A process is described for the preparation of an emulsion of an aqueous fish concentrate and a fatty material stabilized with a calcium compound dispersing agent.

• Drying Oils and Paints

Effect of chemically polluted atmosphere on drying of paints. O. Vaníček, V. Civín, and V. Tâborsky. *Chem. průmysl* 7, 273–6 (1957). Several normally employed priming paints for chemical plant structures have been exposed to the influence of ammonia, hydrogen chloride, sulfur dioxide, and hydrogen sulfide gases, and the drying speed was studied. The highest inhibition of drying was noted on linseed oil with minium as pigment by sulfur dioxide, hydrogen sulfide and ammonia. The hydrogen sulfide medium was very markedly drying-retarding on linseed oil-modified alkyd film and on tung oil modified by cumarone resin. The linseed oil pigmented with minium dried hardly at all in the hydrogen sulfide atmosphere. The concentrations by volume of gases in the test atmospheres were as follows: sulfur dioxide 0.1%, hydrogen chloride 0.001–0.002%, hydrogen sulfide 0.01%, and ammonia 0.5%. (*C. A.* 52, 14189)

Composition and drying properties of Bulgarian poppyseed oil. G. Rankov and G. Georgiev (Chem. Inst. Bulgarische Akad. Wissenschaften, Sofia). *Compt. rend. acad. bulgare sci.* 9, 55–8 (1956). Oil from Bulgarian *Papaver sominferum* had *n* 1.4733; acid number 2.10; saponification number 193.0; iodine number 139.4; thiocyanogen number 83.7; Reichert-Meisl number 0.2; and nonsaponifiable 0.7. The value of poppyseed oil as a drying oil is compared with sunflower seed, walnut, linseed, and soybean oils. (*C. A.* 52, 14198)

Preparation of alkyd resins solely on the basis of fats. G. Rankov, A. Popov, and D. Chobanov (Chem. Inst. Bulgarische Aked. Wissenschaften, Sofia). *Compt. rend. acad. bulgare sci.* 9, 43–6(1956). Sunflower oil was oxidized by the method of Hilditch and Lea. The product was heated with glycerol under carbon dioxide at 195–200° for about 90 minutes to give an alkyd resinlike mass. Triolein gave a similar result; the free fatty acids of sunflower oil needed heating for 130 minutes for gelation. (*C. A.* 52, 14198)

Change of constants of linseed-oil films as a function of aging. A. V. Pamfilov and E. G. Ivancheva. *J. Appl. Chem. U.S.S.R.* 30, 315–18(1958) (English translation). (*C. A.* 52, 14190)

Film-forming properties of oil-modified alkyds based on △-4-endomethylenetetrahydrophthalic acid. J. Tomš. *Chem. průmysl* 7, 276–9(1957). In the drying-oil alkyds the phthalic anhydride cannot be all replaced by the anhydride of △-4-*endo*-methylenetetrahydrophthalic acid because of brittleness and high hardness of resulting film. Replacement up to 50% is permissible. In the nondrying alkyds, on the other hand, a 100% replacement of the phthalic anhydride was not harmful. (*C. A.* 52, 14190)

The action of x-rays on drying oil and related products. D. F. Rushman (Paint Research Sta., Teddington, England). *Fette, Seifen, Anstrichmittel* 60, 185–9(1958). α-Irradiation of straight-chain hydrocarbons as in $C_{36}H_{74}$ produces polymerization as seen by increase in molecular weight, only slight increase in iodine number, and no depolymerization to $C_{18}H_{38}$ or lower fragments. The molecular weight of *cis*-2-octadecene doubles, the iodine number remains unchanged, and a gel is produced at higher radiation levels. Fatty acid esters are essentially di- and trimerized, the saturated members increase and the unsaturated decrease in unsaturation. Flaxseed, soybean, and sardine oils readily polymerize, without change in unsaturation, have lighter color, shorter drying time, but show more turbidity and stronger odor than comparison samples prepared by heat polymerizing the same glycerides in glass at 305° in a carbon dioxide atmosphere. (*C. A.* 52, 14190)

Process for bodying vegetable drying oils with polymer oil. D. F. Koenecke (Esso Research & Engineering Co.). *U. S. 2,846,329.* A drying or semi-drying vegetable oil is mixed with 2 to 25% by wt. of a non-volatile copolymer of a C_4 to C_6 conjugated diolefin with styrene. The mixture is bodied at 230 to 330°.

Film-forming compositions from oiticica oil modified and styrenated alkyds. K. B. Niles (Northrop Aircrapt, Inc.). *U. S. 2,851,430.* A fast air-drying film-forming composition is prepared from an oil-modified phthalate alkyd resin, an oil-modified styrenated phthalate alkyd resin, a drier, and a volatile aromatic hydrocarbon solvent. The resins are modified with oils such as oiticica, linseed, tung, dehydrated castor, or a fish oil fraction having a high iodine value.

Styrenated oil modified alkyd resins and the process of preparing the same containing an alkylidene bis-benzoic acid. J. C. Petropoulos (American Cyanamid Co.). *U. S. 2,851,431.* An oil modified alkyd resin is prepared by the reaction of glyceride oils, fatty acids or monoglycerides with a polyhydric alcohol and a polycarboxylic aromatic acid. The alkyd is then reacted with styrene, alkyl styrene or halo styrene in the presence of a peroxide catalyst at 110° to 215°.

Resinous products. J. C. Petropoulos (American Cyanamid Co.). *U. S. 2,851,432.* A process is described for the preparation of an oil modified alkyd resin by the reaction of drying or semi-drying glyceride oils or fatty acids with a polyhydric alcohol having at least 3 hydroxyl groups and a polycarboxylic aromatic acid.

Drying oils. H. P. Kaufmann. *Ger. 870,312.* Improved drying oils are obtained by addition of 0.005% carotin or carotinoids. Linseed oil containing 0.01% vitamin A palmitate dries several times faster than the oil without the additive. (*C. A.* 52, 14193)

• Detergents

Use of radioactive tracers in the study of soil removal and detergency. E. B. Ashcraft (Westinghouse Research Labs., Pittsburgh, Pa.). *Am. Soc. Testing Materials Spec. Tech. Publ.* 215, 30–41(1958). Applications of radioisotopes as tracers are described for studies in soil retention, soil removal, soil deposition, and the mechanism of detergent action. The tracer technique is compared with the conventional reflectivity technique. (*C. A.* 52, 15100)

Hydrolytic degradation of phosphates in liquid-detergent formulation. W. B. Bennet and R. L. Liss. *Chim. Chronika* (Athens, Greece) 23, 125–30(1958). Some of the properties of the various commercial polyphosphates with respect to hydrolytic degradation in typical liquid all-purpose detergent formulations are demonstrated. The importance of pH as a controlling factor in the degradation process has been demonstrated. (*C. A.* 52, 15099)

Statistical experimental design for studying detergency. R. C. Ferris, M. Patapoff, and J. F. Pietz (Purex Corp. Ltd., South Gate, Calif.). *Chem. Specialties Mfrs. Assoc., Proc.* 1957 (Dec.), 130–4. A design for studying the effect of 5 varieties on the performance of a detergent is presented by using the box method of experimentation. A 2nd order equation is used to relate soil removal to detergent concentration, H_2O hardness, soil load, and washing time and temperature. A measure of reliability and methods of interpretation are shown and some of the limitations discussed. (*C. A.* 52, 15099)

Nonionic surfactants in paints. G. M. Gantz and W. G. Sumner (Antara Chemicals Div., General Aniline & Film Corp., New York). *Official Digest* 30, 890–7(1958). Nonionic surfactants as a class are described with particular emphasis on alkyl phenol-ethylene oxide condensates. The preparation and properties of nonionics are reviewed. The application of nonionic surfactants as emulsifiers is discussed with reference to emulsion polymerization, latex stabilization, and latex paint formulations. The use of nonionics in pigment systems covers grinding, flushing, dispersing, and universal tint formulations.

Sulfonation with sulfur trioxide-high boiling alkylated benzene. E. E. Gilbert and B. Veldhuis (General Chemical Div., Allied Chemical & Dye Corp., Morristown, N. J.). *Ind. Eng. Chem.* 50, 997–1000(1958). Commercial production of oil-soluble sulfonates from high boiling alkylated benzenes, by-product in the manufacture of dodecylbenzene detergent alkylate has expanded rapidly. An exploratory study has been made of the sulfonation of samples from five American producers using 20% oleum and sulfur trioxide on a comparative basis. Comparison shows that sulfur trioxide vapor appears preferable in yield, odor, and inorganic sulfate content of the product, throughput time, lack of formation of spent acid, and equipment requirements, equivalent in average molecular weight of sulfonate, and less favorable in darker product color and greater heat of reaction. Chemical composition is discussed with reference to relative ease of sulfonation of its constituents.

Factors controlling micelle formation in surfactant solutions. J. C. Harris (Monsanto Chemical Co., Dayton, O.). *Soap & Chem. Specialties* **34**(6), 50–3, 180–1; (7), 47–9, 91–2(1958). The measurement of micelle formation, micellar structure, and the practical importance of critical micelle concentration values are discussed. Provided is a comparison of cmc values as obtained by a variety of methods, and gives bench marks for readily available surfactants. 66 references.

Synthetic detergents in bars. A. Hiller, *Parfums, cosmet., savons.* **1958**(4), 146–9. Two combinations are possible: (a) 60–70% synthetic detergent and 30–40% filler, (b) 35–65% water-free soap, 25–50% synthetic detergent, and 10–15% filler. Conditions under which the automatic soap press can be used are given as well as physical and dermatological tests for evaluating the product. (*C. A.* **52**, 13291)

Changes in soap particles by ultrasonics. H. Mahl (Carl Zeiss, Oberkochen, Ger.). *Kolloid-Z.* **156**, 113–16(1958). Ultrasonic waves cause tearing of particles in colloidal soap solutions and changes of shape by fibrillating the interior of platelets while maintaining their outer appearance. The position of the fibrils seems to be connected with certain crystalline reorientations. (*C. A.* **52**, 10614)

The defoaming of synthetic detergent solutions by soaps and fatty acids. H. Peper (Harris Research Labs., Washington, D. C.). *J. Colloid Sci.* **13**, 199–207(1958). The foam of sodium dodecylbenzenesulfonate solutions is rendered extremely unstable by small amounts of sodium palmitate or stearate and calcium ion except in strongly acid solutions. In the presence of sodium laurate or oleate under the same conditions the foam is more stable. Detergents having a straight hydrocarbon chain containing 14 or more carbon atoms give a stable foam in the presence of small amounts of calcium palmitate. A study of the penetration by detergents of monolayers of stearic acid spread on dilute solutions of calcium chloride shows that those detergents the foam of which is stable in the presence of calcium soap penetrate strongly the stearate film, converting it to a mixed, viscous, liquid film.

Hydrolysis of sodium tripolyphosphate in spray drying of washing agents. O. Pfrengle (Chem. Fabrik Budenheim A.-g., Mainz, Ger.). *Fette, Seifen, Anstrichmittel* **58**, 1029–38(1956). Studies were made of the decomposition of tripolyphosphates during spray drying under simulated practice conditions. By control of temperature and spray conditions it is possible either to minimize the decomposition of the tripolyphosphate or to cause it to decompose preferentially to the pyrophosphate. (*C. A.* **52**, 10615)

Is soap outdated? A. K. Prince and W. R. Merriman (Dow Chem. Co., Midland, Mich.). *Soap & Chem. Specialties* **34**(7), 39–42, 87–91(1958). The deficiency of soap in hard water can be overcome by combining the tetrasodium salt of ethylenediaminetetraacetic acid with soap to soften the water. At the new low prices for this type of chelating agent, it is also economically possible to achieve a satisfactory formulation based on soap which will compete with the present commercial heavy-duty synthetic detergents in water up to seven-grain hard.

Paper chromatography in the soap field. K. Roth (Feinseifenwerk Walter Rau & Co., Stuttgart-Mohringen, Ger.). *Fette, Seifen, Anstrichmittel* **59**, 418(1957). The paper chromatography of the fatty acids from soap by using a paper with a crosssectioned barrier permits a separation of the major components. The eluant mixture was 74 parts glacial AcOH, 15 parts MeOH, and 11 parts H_2O, the sample was added in toluene solution, and the development was made with malachite green. (*C. A.* **52**, 11447)

Fifty years of detergent progress. F. D. Snell and Cornelia T. Snell (Foster D. Snell, Inc., New York, N. Y.). *Ind. Eng. Chem.* **50**(8), 48A–51A(1958). The history of the development of the soap and detergent industry in the United States is reviewed. Important developments and the men responsible for them are described. The future of the industry is discussed.

Specific heats of aqueous solutions of some soaps. V. I. Solnyshkin. *Colloid J. U.S.S.R.*, **19**, 629–32(1957). The specific heats of aqueous solutions of sodium oleate and ricinoleate have been determined. The presence of a flattened-out section (Davis plateau) in the concentration range 0.25–0.65 *M* for sodium oleate and 2.25–2.85 *M* for sodium ricinoleate solution is attributed to the formation of laminated soaps. A mechanism for the aggregation of non-ionic soap molecules is suggested on the basis of autoflocculation to spherical micelles with subsequent transition to the plate form and the formation of a colloidal solution from which hydrates of the soap crystallizes as the concentration is increased.

Laundering textiles made of chemical fibers. O. Viertel. *Reyon, Zellwolle u. Chemiefasern* **7**, 494–50(1957). Dirt adheres less to rayon and acetate than to cotton because of their smoother fiber surface; because of their high degree of swelling in water they are easier to wash, but neutral or weakly alkaline washing agent must be used. Luke-warm water and a detergent should be used; yellowing can be prevented by addition of an optical brightener. When perborate-containing washing agents are used, polyamides show a strength loss, polyesters and polyacrylonitriles do not. In the light of present knowledge there should be no difficulty in the laundering of these fibers. (*C. A.* **52**, 15100)

Production of surface active materials. S. L. Norwood and T. W. Sauls (Tennessee Corp.). *U. S. 2,838,564.* Surface active materials are prepared by an improved alkylation-sulfonation process in which no separation or purification of reacting materials is necessary. Olefins are treated with 95–96% sulfuric acid as an alkylation catalyst at a temperature of 0–10°, but instead of separating the sulfuric acid layer after alkylation, the total mixture is sulfonated by adding a sulfonating agent consisting of sulfur trioxide dissolved in liquid sulfur dioxide.

Iodine-surface active carrier germicidal preparations. A. Katz and M. V. Shelanski (West Laboratories, Inc.). *U. S. 2,840,510.* A germicidal composition which is non-irritating and non-staining consists of a complex of iodine with a surface active carrier selected from the group consisting of condensates of ethylene oxide with castor oil and condensates of ethylene oxide with a C_{12} to C_{18} alkyl fatty acid, said complex containing about 0.5% to 15% of iodine based on the weight of the carrier.

Synthetic detergent compositions. R. D. Stayner (California Research Corp.). *U. S. 2,843,550.* Improved synthetic detergent compositions containing as the active organic detergent component water-soluble sulfated alkylolamides of straight-chain saturated C_8 to C_{18} fatty acids, such as are derived from coconut oil and containing, in addition, a straight-chain saturated C_{10} to C_{18} aliphatic alcohol as a foam-improving agent, upon dissolution in water in dilute concentrations will produce copious, stable and persistent foam in laundry use.

Polymerizable esters of alpha-sulfonated fatty acids. R. G. Bistline, Jr., W. S. Port, A. J. Stirton and J. K. Weil (Secretary of Agriculture). *U. S. 2,844,606.* Monomeric and polymeric olefinic esters of α-sulfonated long-chain fatty acids are prepared and found to have improved surface-active emulsifying and detergent properties.

Synthetic detergent bar. D. F. Searle (California Research Corp.). *U. S. 2,845,391.* A synthetic detergent bar which is non-frosting and does not leave a sticky sensation consists of an alkyl aryl sulfonate as the active ingredient, a non-frosting salt of an inorganic acid, an aluminum salt of a saturated C_{14}–C_{20} fatty acid which prevents the sticky feeling, a starch binder and sodium bicarbonate or tetrasodium pyrophosphate as anti-erosion ingredients.

Improvements relating to detergent compositions. Thomas Hedley & Co., Ltd. *Brit. 791,415.* A synthetic bar with improved soap curd dispersion and mildness to the skin consists of an anionic synthetic detergent component in the form of one or more sodium or potassium salts of non-hydrolyzing anionic organic sulfuric reaction products, primarily alkyl glyceryl ether sulfonate, a soluble soap of a fatty acid of from 10 to 18 carbon atoms in chain length and a binder filler such as starch or a wax.

Detergent compositions. W. Weiss. *Brit. 793,255.* Washing, cleansing, softening and rinsing agents of low bulk weight, consisting of a mechanical mixture of an alkali polyphosphate or polymetaphosphate present in a voluminous form are obtained by a direct or indirect spray drying process from an aqueous solution, together with other cleaning agent constituents.