b. Markings. The color tubes are provided with two etched marks, one to indicate an oil column of 133.35 mm. (5.25 in.) and another to indicate an oil column of 25.4 mm. (1 in.).

5. *Filter Paper.* Filter paper, fine porosity such as Eaton and Dikeman No. 512, Whatman No. 12, Reeve-Angel No. 871, or S & S No. 596.

B. PROCEDURE

1. Crude, raw, and refined samples must be treated with 0.5 g. of official diatomaceous earth per 300 g. of oil. Add the diatomaceous earth to the oil and agitate for 2½ min. at 250 r.p.m. at room temperature, or at no more than 10° to 15°C. above the melting point of the fat, if necessary, and filter through an approved paper. Oils which have just been bleached in the laboratory, in accordance with A.O.C.S. Methods Cc 8a-52, Cc 8b-52, or Cc 8d-48, normally are sufficiently clear for the color determination. Suspended material, even if of colloidal size, will cause light scattering. If the sample is not absolutely clear, treat with official diatomaceous earth, as outlined previously, and filter before proceeding with the color determination.
2. Adjust the temperature to 25–35°C., and fill the color tube to the desired mark. If the sample is not completely liquid at 25–35°C., heat to a temperature of not more than 10°C. above the point of complete melting.
3. Place the tube containing the sample in the colorimeter, and put along side of it such red and yellow glasses (see paragraphs a, b, and c) as are necessary to match the color of the oil, observing the sample of the oil and the glasses through the eyepiece.

a. *Crude and Raw Oil Color.*

Crude oils of the coconut type: read the color, using proper ratio of yellow to red listed below:

Up to 3.9 red use 6 yellow to 1 red.
4.0 to 4.9 red use 25 yellow.
5.0 to 5.9 red use 30 yellow.
6.0 to 6.9 red use 35 yellow.
7.0 to 7.9 red use 40 yellow.
8.0 to 10.9 red use 50 yellow.
11.0 to 14.9 red use 70 yellow.
15.0 to 19.9 red use 100 yellow.
20.0 and above use 150 yellow.

If the above ratios fail to give a satisfactory match, this fact should be noted and a second reading made, using the amount of yellow color required for a good match. Report both readings.

Raw inedible oils: tallows, greases, fatty acids, etc.

10 yellow to 1 red, up to 3.5 red.
35 yellow for 3.5 red to 5.0 red inclusive
70 yellow for above 5.0 red.

Dark oils: if the color of the oil or fat sample exceeds 40.0 red, when using the regular 133.35-mm. column, fill another tube to the 25.4-mm. mark and read the color under the same conditions as described for the longer column. (It is assumed that any color result, in which the column height is not designated, has been read on a 133.35-mm. column.)

b. *Refined Oil Color.*

Use only 1 yellow glass, 35 yellow for refined cottonseed oil and refined peanut oil; 70 yellow for refined soybean oil. Use not more than 2 red glasses up to and including 13.0 red, and not more than 3 red glasses above 13.0 red.

c. *Refined and Bleached Oil Color.*

The ratio of yellow to red to be used in determining color is as follows, except where Trading Rules specify the yellow and/or red to be used in determining given grades:

Cottonseed, peanut, and corn oils—10 yellow to 1 red up to 3.5 red; 35 yellow for 3.5 red or above.

Coconut and palm kernel oils—6 yellow to 1 red up to 3.9 red; 10 yellow to 1 red for 3.9 red or above.

Soybean oil—10 yellow to 1 red up to 3.5 red; 70 yellow for 3.5 red or above.

Tallows, greases, fatty acids, etc.—10 yellow to 1 red up to 3.5 red; 35 yellow for 3.5 to 5.0 red inclusive; 70 yellow for above 5.0 red.

C. NOTES

Off-Color (Hue) Oils. Some oils are at times subject to abnormalities in the composition of their pigment content. This results in the occurrence of hues which cannot be matched, even approximately, using the fixed yellow, or yellow to red, ratio designated above. In such cases, if a standard combination is specified, report whether the oil is lighter or darker than the standard. If a standard combination is not specified, report the yellow and red glasses which most nearly match the color of the sample.

ABSTRACTS . . . R. A. REINERS, Editor

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

• Oils and Fats

The separation of complex lipide mixtures by the use of silicic acid chromatography. T. Hirsch, E. H. Ahrens, Jr. (The Rockefeller Inst., N. Y. City). *J. Biol. Chem.* 233, 311–20 (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.

Some recent developments in phospholipide chemistry. G. Jacini. *Oléagineux* 13, 39–52 (1958). A discussion is given regarding glycerophosphatides (synthesis, chromatographic and countercurrent fractionations, C_{18}–C_{22} fatty acids, lecithinases, and lysophosphatides), plasmalogens, inositophospholipides, sphingomyelin, and sphingosine. (*C.A.* 52, 12123)

Presence of sitosterol in soft and hard wheat flour. G. Fabriani (Ist. nazl. nutriz. del Cons. nazl. ricerche, Rome) and A. Fratoni. *Quaderni nutriz.* 15, 130–41 (1955) (Pub. 1956). The sitosterol content (in mg.–%) of Italian soft and hard wheat varieties was given. For macaroni samples of hard and soft wheat seminola, contents of 0.86–2.08 and 8.53, respectively, were found. (*C.A.* 52, 12258)

Influence of rancidity in cereals. K. Karp. *Oléagineux* 13, 153–6 (1958). The fat content of cereal grains is physiologically important. The rye germ oil has the highest content of linoleic acid, the most important of the essential fatty acids. In breadmaking, it is essential from the quality standpoint, to prevent the labile germ oil from autoxidizing and becoming rancid. A fat-stable and undamaged grain should be used. Twelve references. (*C.A.* 52, 12257)

Human milk fat as ointment base. J. Schmid. *Pharm. Zentralhalle* 94, 1–3 (1955). Pooled human milk, unsuitable for infant feeding, is churned, separated, the butter layer extracted with ethyl ether, dehydrated with sodium sulfate, and the ethyl ether distilled off. The fat, with or without water, is nonirritant and readily absorbed by the skin. It is used in various ointments. (*C.A.* 52, 12316)

Infrared spectrophotometry of linseed oil. Comparative autoxidation of the cis and trans forms in the case of one double bond. J. P. Helme and J. Molines. *Oléagineux* 13, 141–8 (1958). A study was made of the infrared absorption spectra of linseed oil, both raw and treated (stand oil), and of the relative autoxidation of the *cis* and *trans* forms of the oil. The 10.35-micron band was found to correspond to the formation in the treated oil of the highly active *trans* form, which autoxidizes more slowly than the *cis* form. (*C. A.* 52, 12418)

Comparative study of some commercial antioxidants. C. Paquot and J. Mercier. *Oléagineux* 13, 243–8(1958). Comparative study was made of the effectiveness of the main antioxidants available on the French market with respect to linseed-oil ethyl esters. Nordihydroguaiaretic acid, hydroquinone, pyrogallol (at the rate of 0.01%), and Metophan (at the rates of 0.1% and 0.05%) proved to be excellent antioxidants. (*C.A.* **52**, 12418)

Refining by detergency. L. I. Gilles. *Oléagineux* 13, 137–40 (1958). Application of detergents in the alkaline refining of oils to reduce losses is discussed. (*C.A.* **52**, 12426)

Ultraviolet absorption spectra studies of vegetable oils. J. Hires and E. Tombácz(Tudományegyetem, Szeged, Hung.). *Magyar Kém. Folyóirat* **59**, 1–5(1953). The components of blends of vegetable oils (tung oil, linseed oil, and sunflower-seed oil) are determined on the basis of their ultraviolet absorption spectra. A new method is based on the degree of conjugation of the oils. (*C.A.* **52**, 12426)

Variations in the activity of absorbents. V. Jančík(Vyzk. ústav oleje a tuky, Ustí n. L., Czech.). *Oléagineux* **13**, 307–16(1958). The effect of 24 hours heating at temperatures of 50–900° on bleaching activity of montmorillonite clays is studied. Activity was greatest for samples dried at 100° as shown by titration with Sudan red. Above 100° decoloring activity decreased. The presence of small amounts of refined oils or the methyl esters of soybean fatty acids lowered the absorbing power. Triglycerides lowered the absorbing power more than did fatty acids. Extraction for 50 hours with petroleum ether failed to regenerate the absorbents. (*C.A.* **52**, 12426)

Influence of neutralization and bleaching methods on the removal of sterols from rape oil. H. Niewiadomski. *Oléagineux* 13, 175–7(1958). Various caustic refining techniques influence the degree of sterol passage into soapstocks. The bleaching transforms sterols into a form which does not react with digitonin, but has little effect on the sterol removal from the oil. (*C. A.* **52**, 12426)

Influence of partial glycerides on fat plasticity, with particular reference to palm oil. M. Loncin. *Oléagineux* 13, 33–7(1958). Plasticity measurements of fats indicated that the lower the acidity of the fats, the harder they were at 15° and 20°. This was due to eutectic formation between the triglycerides and the diglycerides. The melting point of raw palm oil was found to rise when its acidity decreased. With Belgian Congo fats, the presence of free fatty acid appeared to influence the plasticity; bleaching and alkaline refining had no appreciable effect on it. (*C.A.* **52**, 12425)

Effect of the interior lining of metal drums on the characteristics of stored oils. F. Blasi. *Oléagineux* 13, 89–91(1958). Olive oil in plastic-lined metal drums rancidifies more quickly than oil in wooden barrels or glass flasks. Chlorinated rubber and some phenolic linings imparted disagreeable flavors to the oil. Epikote linings appeared the most satisfactory, when the weld was protected with a Vitroval coating. (*C.A.* **52**, 12425)

Use of acetone in the olive oil industry. B. Foresti and A. Giuffrida. *Oléagineux* 13, 131–3(1958). Use of acetone for deacidifying of olive oil, extraction of the oil from undried olive cakes, and removal of parathion from olive oil is investigated. Suitable acetone-water mixtures are developed for the respective purposes. (*C.A.* **52**, 12425)

The refining of Spanish cttonseed oils. I. Their behavior during neutralization and decoloration. R. de Castro Ramos and J. M. R. de la Borbolla y Alcalá(Inst. grasa deriv., Seville). *Grasas y aceites* (Seville, Spain) 8, 250–7(1958). (*C.A.* **52**, 12425)

Solubility equilibriums between cottonseed oil, acetone, and water. R. Rigamonti and G. Botto. *Oléagineux* 13, 199–202 (1958). Data on solubility equilibriums, at 22 and 45°, of systems containing acetone, water, and cottonseed oil (neutral or containing 5% free fatty acids) are presented as basic information for extraction of cottonseed oil. Results obtained are tabulated, plotted, and discussed. A continuous operation such as the percolation of acetone through the seed, would likely give an almost complete extraction of the oil with a smaller amount of solvent than calculated. Twelve references. (*C.A.* **52**, 12425)

The preservation of some tropical oil seeds. Y. Bagot and M. Servant. *Oléagineux* 13, 57–61(1958). The effects of factors such as pulping, washing, dipping in hot water, variable humidity, and drying (natural and artificial) on the storability of shea-butter, castor, peanut, and copra seeds are determined. (*C.A.* **52**, 12424)

Cold percolation method for rapid gravimetric estimation of oil in small quantities of seed. A. R. S. Kartha and A. A. Sethi (Indian Agr. Research Inst., New Delhi). *Indian J. Agr. Sci.* **27**, Pt. 2, 211–17(1957). A new cold-percolated method of determining the yield and iodine value of oil in small quantities of seed is described. (*C.A.* **52**, 12424)

Unsaponifiable matters of echinoderms. II. Properties of hitodesterol. T. Matsumoto and T. Wainai(Nippon Univ., Tokyo). *Nippon Kagaku Zasshi* **75**, 1147–9(1954). Hitodesterol isolated from *Asterias amurensis* gave a Δ^7-stenol on partial hydrogenation and stigmastenol on complete hydrogenation. The infrared spectrum of hitodesterol and melting point of various derivatives (acetate, benzoate, and 3,5-dinitrobenzoate) are identical with α-spinasterol. (*C.A.* **52**, 11881)

Polarographic study of the autoxidation of linoleic acid esters. J. Mercier. *Oléagineux* 13, 165–7(1958). Polaragraphic data from ethyl linoleate autoxidized at 40° are tabulated, plotted, and discussed. The proportionality between the chemical peroxide index and the height of the hydroperoxide reducing curve could be verified. An unsaturated aldehyde-type product appeared as an impurity in the ethyl linoleate prepared by crystallization and fractional distillation. (*C.A.* **52**, 12423)

Effect of vanillin on stability of vegetable shortening. K. M. Narayanan, N. S. Kapur, G. S. Bains, and D. S. Bhatia(Central Food Technol. Research. Inst., Mysore, India). *Food Sci.* (Mysore) 6, 245–8(1957). The effect of vanillin as a stabilizer for vegetable shortening (melting at 37°) was studied under accelerated storage conditions (100 ± 2°) by chemical and organoleptic tests. Vanillin shows antioxidant properties when incorporated into the shortening. (*C.A.* **52**, 13132)

Refractometric method for the determination of fat in butter and margarine. L. C. Gasanova and G. A. Kocharyan(Trust Bread Baking Ind., Baku). *Khlebopekar. i Konditer. Prom.* 2(3), 36–7(1958). A refractometric method for determining fat in butter and margarine is simple, rapid (3–5 minutes), and has an accuracy of ± 0.2% as compared with a standard method. (*C.A.* **52**, 13130)

Determination of component fatty acids of butterfat by low-temperature crystallization and urea complexes. S. Tawde and N. G. Magar(Inst. Sci., Bombay). *Indian J. Dairy Sci.* **10**, 137–46(1957). The mixed fatty acids from a typical sample of ghee was fractionated. The sample had 63.41% saturated and 36.59% unsaturated acids, of which the dominant acids were palmitic and oleic, respectively. (*C.A.* **52**, 13130)

Lipide oxidation in dry whole milk. C. M. Stine(Univ. of Minnesota, Minneapolis). *Univ. Microfilms* (Ann Arbor, Mich.), *L. C. Card* No. **Mic 58-1142**, 140 pp.; *Dissertation Abstr.* 18, 1391(1958). (*C.A.* **52**, 13129)

Separation of antioxidants by reversed-phase paper chromatography. S. Yasuhara and S. Masuyama(Osaka City Ind. Research Inst.). *Kagaku to Kôgyô* (Osaka) 31, 399–401(1957). By reversed-phase paper chromatography, with liquid paraffin as the fixed phase, butylhydroxyanisole, nordihydroguariaretic acid, and ethyl, propyl, and isoamyl gallates (five antioxidants legally permitted to be added to table oils and fatty foods as preservatives) were successfully separated after developing in 5% methyl acetate or ethyl acetate. (*C.A.* **52**, 13125)

The C_{18}- and C_{22}-polyenoic acids of herring oil. E. Klenk and H. Brockerhoff(Univ. Cologne, Ger.). *Z. physiol. Chem.* **310**, 153–70(1958). The following C_{18}- and C_{22}-polyenoic acids were isolated from a mixture of unsaturated acids of herring oil by fractional vacuum distillation of their esters and countercurrent distribution: linoleic, linolenic, 7,10,13,16,19-docosapentaenoic, and 4,7,10,13,16,19-docosahexaenoic, besides 6,9,12,15-octadecatetraenoic which was obtained earlier. 4,7,10,13,16,19-Docosahexaenoic acid was also isolated from codliver oil. A method was devised by which the location of a double bond could be determined which was also useful to ascertain terminal double bonds. Accordingly, the ozonides of the polyenoic acids were reductively split, the aldehydes formed converted to the hydrazones and these separated by column chromatography. The individual zones were examined photometrically and the hydrazones were identified by paper chromatography and through isolation of the compounds. The approximate occurrence of these acids in herring oil was ascertained. Relatively large amounts of acids of the linolenic type are found in fish oils, whereas in mammal acids of the linoleic type occur mostly in the phosphatides of the organs. (*C.A.* **52**, 13289)

Cornelian cherries and its seed oil. A. Koch(Bezirks-Hygene-Inst., Jena, Ger.). *Pharm. Zentralhalle* **96**, 448-51(1957). Seventy-two grams fatty oil was extracted from 1289 g. of seeds of cornelian cherries. The oil has n_D^{20} 1.4765, saponification number 192, unsaponifiable 2.8%, iodine number (Kaufmann) 133.63, thiocyanate number 72.94, Hehner number 94.23, fatty acids soluble in petroleum ether 94.3%, fatty acids insoluble in petroleum ether 5.7%, total fatty acids (calculated from saponification number) 95.66%, glycerol residue (calculated from saponification number) 4.34%, neutralization number of the fatty acids (calculated) 200.7, average molecular weight of the fatty acids (calculated) 279.54. On the basis of the fat constants, the seed oil from cornelian cherries was a drying oil. It is unsuitable for food purposes because of its astringent taste. The fruit pulp contains appreciable amounts of vitamin C and has a pleasant taste. (*C.A.* **52**, 13289)

Linden-seed oil. A. A. Schul'man and Z. S. Zakrividoroga (Chernovtsy Med. Inst.). *Vrachebnoe Delo* **1958** 93–4. Roasted linden seeds are very tasty, harmless, and nutritious. The oil extracted with ether from the fresh seeds is pale yellow; from roasted seeds it is orange-yellow. The taste is similar to that of sunflower-seed oil, except that it has no odor. It resembles sunflower-seed oil in index of refraction, iodine number, saponification values, etc. The oil content of seeds is 12% versus 18% for the sunflower-seed oil. It induces walnut-like flavors to bakery products. (*C.A.* **52**, 13289)

Hydrogenation of corn oil. I. N. Volkova and Ya. I. Denisenko Technol. Inst. Food Ind., Moscow). *Masloboĭno-Zhirovaya Prom.* **24**(3), 17–18(1958). The tabulated data concerns the physical-chemical properties of crude, refined, and hydrogenated corn oil. (*C.A.* **52**, 13289)

Comparison of methods for determination of gossypol in cottonseed oil, seed, cake, and grist. V. P. Rzhekhin and N. I. Pogonkina. *Masloboĭno-Zhirovaya Prom.* **24**(3), 4–8(1958). The method of Pons, *et al.* (*C.A.* **44**, 11128b) is recommended for the determination of free gossypol in cottonseed oil, seed, cake, and grist. (*C.A.* **52**, 13289)

Effect of maturity of rapeseed on stability of oil. A. Rutkowski, Z. Makus, and A. Stefaniuk (Inst. Fats and Oils, Warsaw, Poland). *Roczniki Technol. i Chem. Zywnosci* **2**, 91–9(1957). Activity of lipase declines and total solids increase with maturity of seeds. Stability of oil increases from 37 to 72 minutes (time to attain 50 milliequivalent active oxygen/kg.) and tocopherol content increases from 31.4 to 44.6 mg. % in nine days before harvesting. (*C.A.* **52**, 13289)

Fatty oil from Silybum marianum. G. V. Pigulevskii and S. B. Rzaeva. *Zhur. Priklad. Khim.* **31**, 504–6(1958). The pitch oil from *Silybum marianum* extracted with ethyl ether contained 17.8% fatty acids consisting primarily of stearic acid. (*C.A.* **52**, 13288)

Continuous hydration of soybean and flax-seed oils with production of phospholipide concentrates. G. I. Baglai, E. G. Patkanov, V. P. Rzhekhin, and E. A. Semenov (Oil-Fat Combine, Dnepropetrovsk). *Masloboĭno-Zhirovaya Prom.* **24**(4), 7–9 (1958). Tabulated data are given concerning phospholipides, hydrophilic matter, ash, and moisture contents of soybean and flax-seed oils before and after hydration treatment, and of phospholipides, moisture, fat, and foreign-matter contents of phopholipide concentrates obtained from settling tanks. (*C.A.* **52**, 13288)

Applications of pectinase. F. Dueso Tello. *Rev. acad. cienc exact. fis. quim. y nat. Zaragoza* **10**(2), 75–84(1955). The influence of pectinase in increasing the extraction of olive oil from olives is shown. (*C.A.* **52**, 13288)

Refractometer method for determination of concentration of miscella. F. A. Vishnepol'skaya and I. E. Bezuglov. *Masloboĭno-Zhirovaya Prom.* **24**(4), 9–10(1958). Refractometer method for analysis of cottonseed, soybean, and sunflower-seed miscella is briefly described. (*C.A.* **52**, 13288)

Manufacture of cocoa-butter substitute. M. K. Yakubov (Polytech. Inst. Kharkow). *Masloboĭno-Zhirovaya Prom.* **24**(4), 19–22(1958). Description with a diagram of an apparatus for the manufacture of cocoa-butter substitute from cottonseed and whale oils, based on the selective hydrogenation of these oils is presented. (*C.A.* **52**, 13288)

Manufacture of palmitic acid by fractional distillation of fatty acids from cottonseed oil. M. V. Dmitrievskaya, N. P. Raemskaya, and N. N. Zelenetskiĭ (Factory "Steol," Moscow). *Masloboĭno-Zhirovaya Prom.* **24**(4), 22–4(1958). Description with a diagram of the fractionation column for the separation of palmitic acid from cottonseed oil and its soap stock, and tabulated data concerning yield, melting point, acidity, and iodine number of the fractions are presented. (*C.A.* **52**, 13287)

Manufacture of commercial fractions of synthetic fatty acids. B. N. Tyutyunnikov and N. K. Man'kovskaya (Polytech. Inst. Kharkov). *Masloboĭno-Zhirovaya Prom.* **24**(3), 22–6(1958). A method is described whereby the darkening of synthetic fatty acids manufactured from paraffin by direct oxidation method, and the cost of their clarification by distillation procedure are reduced to the minimum when fatty acids in the soaps were liberated by carbon dioxide, instead of sulfuric acid, in an autoclave at 50–60° and 35 atmospheric pressure. The soaps were split selectively, and the high-molecular fatty acids were regenerated first. There was no visible regeneration of C_1–C_{10} acids in the soaps either in water or aqueous alcohol solution. Soaps of C_6–C_{10} acids formed acid soaps with high-molecular fatty acids and consequently contaminated them. Soaps of C_1–C_5 acids did not form acid soaps. Fatty acids in the acid soaps were readily regenerated in 50% aqueous alcohol solution and then completely separated from neutral soaps by the ligroine-extraction procedure. (*C.A.* **52**, 13287)

A new method for qualitative and quantitative chromatography of critical fatty-acid partners. H. P. Kaufmann and A. A. Karabatur (Univ. Münster, Ger.). *Nahrung* **2**, 61–75(1958) (English summary). By the horizontal paper-strip chromatography method of Kaufmann and Nitsch the even-numbered fatty acids (C_{10}–C_{26}) were separated. Fatty-acid mixtures before and after hydrogenation were chromatographed in parallel, and qualitative and quantitative calculations made as to the composition of the mixture. German rape oil contained 15% eicosenic acid. (*C.A.* **52**, 13287)

Nickel soap content of hydrogenated fat. V. P. Golendeev (Polytech. Inst., Gorki). *Masloboĭno-Zhirovaya Prom.* **24**(4), 16–18 (1958). Nickel soap was formed during the hydrogenation of oil with copper and nickel carbonates as the catalysts. Nickel soap, as determined chromatographically, was largely retained by the finished product. (*C.A.* **52**, 13287)

Determination of the cholesterol and isocholesterol content of wool fat. H. Janecke and G. Senft (Univ. Frankfurt a.M., Ger.). *Pharm. Zentralhalle* **96**, 431–43(1957). A reliable method was devised for determining cholesterol and isocholesterol in the presence of each other. (*C.A.* **52**, 13286)

Refining of fats in an inert atmosphere. A. G. Sergeev. *Masloboĭno-Zhirovaya Prom.* **24**(3), 12–14(1958). Methods for the manufacture of carbon dioxide and nitrogen, and their use to protect the fats and oils during refining and storage, and refining under vacuum are discussed. A diagram of the apparatus is given. (*C.A.* **52**, 13285)

Stabilization of fats and oils by antioxidants. Z. K. Lebedeva. *Masloboĭno-Zhirovaya Prom.* **24**(4), 12–15(1958). A review. (*C.A.* **52**, 13285)

Characterization of semidrying oils in olive oil. Vizeran and Guillot. *Chim. anal.* **40**, 118–19(1958). The applicability of the previously described (*C.A.* **34**, 653⁴) test for impurities in olive oil of high iodine number is demonstrated. (*C.A.* **52**, 13283)

Separation of the whale-oil acids by crystallization with urea. M. S. Dudkin and N. S. Skornyakova (I. V. Stalin Technol. Inst., Odessa). *Masloboĭno-Zhirovaya Prom.* **24**(3), 19–21 (1958). Urea precipitation will separate 80% of the whale-oil acids. The yield of crystals and the iodine number of purified acids increased somewhat with the urea content of solvent. Mixed fatty acids with iodine number ~240 were retained by the filtrate and formed no complexes with urea. From 40 to 60% of purified acids were solid and satisfactory for the manufacture of soap. (*C.A.* **52**, 13290)

Polarographic studies on rancid fish oil. II. T. Kikuchi and I. Okada (Tokyo Inst. Fisheries). *Nippon Suisan Gakkaishi* **22**, 784–6(1956–57). Polarographs of sardine oil, tunny-fish oil, calamary-oil, lard, beef tallow, and soybean oil were studied. The oxidized fats and oils showed polarographic waves, the reduction potential being −0.4, −1.2, and −1.9 volts versus standard calomel electrode. The fresh fats and oils showed two waves, reduced in −0.4, and −1.2 volts versus standard calomel electrode. The wave of reduction potential, −1.9 volt, was due to the oxidation products. Changes of the waves during the auto-oxidation of fats and oils at −1.9 volt could serve to measure the degree of oxidation. (*C.A.* **52**, 13290)

Determination of small amounts of inorganic sulfate in sulfonated oils. R. Motoyama and S. Okada. *Oléagineux* **13**, 169–73(1958). A colorimetric method for inorganic sulfate in sulfonated and sulfated oils is based on a measure of the chromate ion liberated on adding barium chromate. It is rapid, simple, and accurate, though it is less precise than the gravimetric method. (*C.A.* **52**, 12423)

Cracking of castor oil, its by-products, and their possible uses. G. Dupont. *Oléagineux* **13**, 119–21(1958). The still residue oils from cracking of castor oil consists of methyl esters, or glycerides of various fatty acids, free acids (such as undecylenic acid) from nonesterified fatty acids, and final products from various polymerizations. Their high linoleate content suggests use as drying oils. The distilled aldehydic oils consist of oenanthol (20%), hydrocarbons of the ethylene series, and acid methyl esters. The mixture is an excellent solvent for rubber and plastics. Its odor is a drawback which can be easily eliminated. (*C.A.* 52, 12424)

The use of iodine for the detection of lipids on paper chromatographs. M. W. Whitehouse, A. E. Bresler, and Ezra Staple (Univ. of Penn., Philadelphia, Pa.). *J. Chromatog.* 1, 385–386 (1958). Lipids are detected on developed paper chromatographs by overnight exposure of the dried paper to a few crystals of iodine in a closed chamber. The lipids show as brown or yellow spots. Also, the papers may be sprayed or dipped in a 0.2% solution of I_2 in petroleum ether or diethyl ether and the excess I_2 allowed to volatilize.

Bleaching earths for vegetable oil refining. S. S. Joshi, M. A. Hai, and S. A. Saletore(Regional Research Lab., Hyderabad, India). *Paintindia* 8(1), 53–54(1958). Better color absorption by bleaching earths is associated with low bulk density, high moisture content, fine particle size and near neutrality.

Rancidity of edible fats. II. Methods used in measuring rancidity and stability of fats. Ahmed Abu—NASR(Univ. of Alexandria, Egypt). *Oil and Soap (Egyptian)* 5(1), 31–27(1958). A review of the methods of detecting and measuring rancidity in fats. 32 references.

The distribution of fatty acids between n-heptane and aqueous phosphate buffer. D. S. Goodman(Lab. of Cellular Phys. and Metabolism, Nat. Heart Inst., Nat. Insts. of Health, Bethesda, Md.). *J. Am. Chem. Soc.* 80, 3887–92(1958). A study has been made of the distribution of 8 fatty acids between *n*-heptane and aqueous phosphate buffer at pH 7.45, ionic strength 0.16 at 23°. The fatty acids studied included octanoic, decanoic, lauric, myristic, palmitic, stearic, oleic and linoleic acids. C^{14}-carboxyl labeled acids were used for assay, enabling accurate measurements to be made at extremely low concentrations and over a range of several orders of magnitude in each case. The data obtained with octanoic, decanoic, lauric and myristic acids are consistent with the assumption of a monomer-dimer equilibrium in the organic phase, without association in the aqueous phase. The association (dimerization) constants for these four fatty acids in heptane saturated with water have been calculated from these data and are, respectively, 5.8, 6.9, 7.0 and 9.3×10^3. These constants are compared with others available in the literature.

Determination of steroid alcohols with acetic anhydride-C^{14}. V. P. Hollander and Julia Vinecour(Univ. Virginia, School of Med., Charlottesville, Va.). *Anal. Chem.* 30, 1429–31(1958). A simple procedure for the measurement of steroid alcohols by acetylation with acetic anhydride-C^{14} is described. Application to pure compounds or partially purified mixtures is intended. Preparation of the radioactive acetates permits separation, identification, and quantitation in submicrogram amounts. Excess acetic anhydride can be recovered, to decrease the cost of the analysis. Androsterone, dehydroepiandrosterone, cortisone, and corticosterone may be measured singly or in a mixture. Hydrocortisone and corticosterone can be recovered from plasma. Androsterone and dehydroepiandrosterone cannot be adequately recovered from plasma by this procedure. The procedure is capable of submicrogram determination of steroid alcohols in favorable cases, where radiopurity of the derivative can be obtained.

The electric moments of organic peroxides. I. Dialkyl peroxides, alkyl hydroperoxides, and diacyl peroxides. W. Lobunez, J. R. Rittenhouse and J. G. Miller(Dept. Chem., Univ. Penna., Philadelphia, Penna.). *J. Am. Chem. Soc.* 80, 3505–9(1958). The electric moments of a group of dialkyl peroxides, alkyl hydroperoxides and diacyl peroxides have been measured in benzene at temperatures in the range 20–50°. The observed moments agree with those calculated for fixed skew configurations about the peroxy grouping as in the Penney-Sutherland structure for hydrogen peroxide. In the diacyl peroxides, both of the carbonyl groups appear to face inward.

The lipids of ox compact bone. A. A. Leach(British Gelatine & Glue Research Assoc., 2a Dalmeny Ave., Holloway, London, N. 7). *Biochem. J.* 69, 429–32(1958). Dry ox femur bone was found to contain 0.0673% of lipid and a mixture of other leg bones 0.0629% by extraction with cold acetone. These lipids contained, respectively, 13.3 and 10.9% of free cholesterol, 79.2 and 85.5% of triglycerides, and 1.7 and 2.4% of cholesterol esters. Some phospholipids and probably β-carotene were also present. The extracts contained some protein which may have been a contaminant due, in part, to the technique of extraction. The free cholesterol content of compact bone appears to be higher than that of osseocollagen prepared from compact bone by demineralization.

Some properties of surface films formed by adsorption of n-nondecanoic acid on mechanically activated metal surfaces. H. A. Smith and T. Fort, Jr.(Chemistry Dept., Univ. Tennessee, Knoxville). *J. Phys. Chem.* 62, 519–27(1958). Fresh surfaces prepared by machining metals under an inert, non-polar solvent are for a short period chemically hyperactive. Such surfaces adsorb *n*-nonadecanoic acid from cyclohexane solution to a limiting value of one monomolecular layer, with the formation of the metal soap. Adsorption isotherms are presented for various metal surfaces. A possible mechanism for the adsorption phenomena is discussed.

Radioactive tracer studies of monolayers. H. Sobotka(Dept. Chemistry, Mt. Sinai Hospital, New York, N. Y.). *J. Phys. Chem.* 62, 527–31(1958). The use of radioactive tracers in built-up films of stearic acid or barium stearate-stearic acid permits a study of the kinetics of film reactions such as sublimation, skeletonization by organic solvents and ripping-off by serum albumin. The rate appears to be a combination of the reaction rate of the free fatty acids in the top layer and of the diffusion rate of free fatty acids from the lower layers up to the surface of the film. A possible mechanism is discussed for the ripping-off reaction.

Energy relations in monolayer formation: the spreading of long-chain fatty acids on aqueous surfaces. G. E. Boyd(Kent Chemical Lab., Univ. Chicago, Chicago, Ill.). *J. Phys. Chem.* 62, 536–41(1958). The temperature variations of the equilibrium spreading pressure of tridecylic, myristic, pentadecylic and palmitic acids on clean aqueous surfaces are reported. The molar latent heats, entropy, free energy and enthalpy changes accompanying monolayer formation were estimated. The results are discussed in terms of the possible molecular structures of the films.

Temperature dependence of viscosity of oils. Y. P. Varshni and S. N. Srivastava(Dept. Physics, Allahabad Univ., Allahabad, India). *J. Phys. Chem.* 62, 706–9(1958). Viscosity-temperature relations are reported for several hydrogenated cottonseed oils.

Trace constituents of hydrogenated ox perinephric fat. R. P. Hansen, F. B. Shorland and N. June Cooke(Fats Research Lab., Dept. of Scientific & Industrial Research, Wellington, N. Z.). *J. Sci. Food Agr.* 9, 391–6(1958). Trace components, comprising more than 2% of the total fatty acids were isolated from hydrogenated ox perinephric fat by fractional crystallization, distillation of methyl esters, and gas chromatography. The following saturated acids were isolated and identified: *n*-decanoic, *n*-dodecanoic, *n*-pentadecanoic, 13-methyltetradecanoic, (+)-12-methyltetradecanoic, *n*-nonadecanoic, *n*-eicosanoic, *n*-heneicosanoic, *n*-docosanoic, *n*-tricosanoic, *n*-tetracosanoic, and *n*-hexacosanoic. In addition, *n*-undecanoic and *n*-tridecanoic acids were identified. Myristic, palmitic and stearic acids present in more than trace amounts were also conclusively identified.

Export markets and the U. S. oilseeds industry. R. A. Ioanes (Foreign Agr. Service). *Soybean Digest* 18(8), 16–17(1958). The possible markets for oilseeds and oils in Spain, Italy, Greece, Turkey and Japan are reviewed briefly.

Method for continuous production of butter. A. Masek and Z. Malik(VSCHP, Vyzkummy ustav stroju chaladichich a potravinarskych). *U. S. 2,840,460.* An apparatus and process for the continuous production of butter from cream are described.

Lanolin composition. G. S. Kass(Saint Cornelius the Centurion Chapel of Valley Forge Military Academy). *U. S. 2,840,509.* A cosmetic which is liquid at room temperature is prepared from 10 to 50% by wt. of lanolin, 10 to 75% of mineral and/or vegetable oils, and 2 to 65% of an oil-soluble polyoxyethylene.

Continuous method of treating glyceride oils. G. Barsky(E. F. Drew & Co., Inc.). *U. S. 2,840,585.* A continuous process for the reaction of glycerides with higher fatty acids is described.

Dustless meal. E. H. Brockman(one-third to Pauline Brockman). *U. S. 2,841,496.* Dusting of a solid during grinding is reduced by the addition of a small amount of oil-bearing seed having an oil content in excess of about 12%.

Process for decolorizing green soybean oil. K. G. Stern(H. Sobotka). *U. S. 2,842,577.* Green colored materials are removed from soybean oil by successively treating it with charcoal and a monosaccharide or disaccharide.

Method for ascertaining the percentage of butterfat content of milk. E. M. Borg. *U. S. 2,844,067.* A sample of milk is diluted and emulsified with water. Light transmission is measured in a photoelectric meter having a scale calibrated to show current intensity as butter fat percentage.

Apparatus for handling shortening. H. G. Stirm, R. W. Smith and E. B. Stirm(Ferry Sheet Metal Works, Inc.). *U. S. 2,844,264.* Apparatus is described for heating and emptying a container of shortening.

Alkali refining rice oil in the presence of a OH group-containing additive. E. R. Cousins, S. Bhodhiprasart and R. Prachankadee (Secy. Agr., U.S.A.). *U. S. 2,844,613.* The refining loss is appreciably lowered by alkali refining the oil by the AOCS Test Method Ca9a-52 in the presence of 0.5 to 5% by wt. (based on crude oil) of a sugar or C_2 to C_5 polyhydric aliphatic alcohol.

Apparatus and method for steam deodorizing of fats and oils. P. Thomson (The Procter & Gamble Co.). *U. S. 2,845,444.* A continuous process for the steam deodorization of fats and oils is described.

Continuous solvent extractor and solvent extraction system. G. B. Karnofsky (Blaw-Knox Co.). *U. S. 2,849,459.* A continuous system for the solvent extraction of vegetable oils is described.

Recovery of fats and oils from animal or vegetable materials. Van der Woude & Fabisch N. V. *Dutch 85,730.* Fat-containing materials, such as meat, fish, animal organs, seeds, fruits, or garbage, are ground to such a fineness that the cells are opened. The minced material is treated with water in the presence of an emulsifying agent of such a type and in such a quantity that all the fat or oil is extracted from the cells and emulsified with the water. On the other hand, the stability of the emulsion is limited so that the fat or oil can easliy be separated by centrifugation. Examples of wetting agents with only small emulsifying power are polyoxyethylenesorbitan monolaurate and monostearate. The fat content of the emulsion must be less than 20%. The aqueous liquid can be recycled after separation by centrifugation. (*C.A.* 52, 13292)

Vacuum distillation. Société anon. Ateliers Pingris & Mollet-Fontaine réunis. *Fr. 1,046,122.* The distillation of organic materials from thin liquid layers at pressures of 0.1-0.01 mm. mercury and with distances between the evaporating and condensing surfaces of 8–30 mm. is described. The apparatus consists of a rotating cone, heated on the outside surface, along whose inner surface the liquid to be distilled flows in an upward direction because of the centrifugal force. The vapor leaving the surface is condensed and cooled on the outer surface of a stationary cone mounted concentrically inside the rotating cone. Both cones are mounted in a vacuum-tight enclosure. Specific applications that are mentioned are deodorization and deacidification of edible oils at 80–160° and recovery of a concentrated carotene fraction from palm oil acids or esters. (*C.A.* 52, 11491)

Hard wax polish. E. Brennecke (Firma Gottlob Epple). *Ger. 855,293.* A process for preparing a fluid or semifluid wax polish from a high-melting wax is described. Petroleum is mixed with melted wax and the mixture is then fed into an atomizer and expelled through a nozzle heated to the melting point of the wax. The resulting fine, soft wax powder is then dispersed in a fluid which wets the wax, e.g. turpentine or white spirit. The polish is suggested for use on automobiles, furniture, or floors. (*C.A.* 52, 12428)

Bleaching of waxes and fats. M. Aschenbrenner (Badische Anilin- & Soda-Fabrik Akt.-Ges.). *Ger. 894,592.* Fat or wax is bleached by means of an aqueous solution of, e.g., 10% chromic sulfate, 40% sulfuric acid, and 2% chromic oxide at 110°. The solution is admitted at such a rate that it leaves the bleaching bath with a 1% chromic oxide content. In an electrolytic cell with tungsten or molybdenum cathodes, the chromic oxide content is again increased to 2%. By circulating the solution, the destructive effect of a 10% chromic oxide starting solution, and the slow action of a low-chromic oxide bleaching solution are both avoided. (*C. A.* 52, 12427)

Treatment of fatty-acid mixtures with urea. H. Sakurai. *Japan. 7183('56).* In the separation of fatty-acid mixtures by urea-adduct formation, urea sometimes cannot be effectively recovered because of formation of adducts which are not decomposed even at high temperature. The urea solution containing such undecomposed adducts becomes turbid and cannot be used repeatedly. This difficulty is prevented by adjusting the pH of original or recovered urea solution to 3.5. (*C.A.* 52, 13291)

FATTY ACID DERIVATIVES

Higher fatty alcohols. XIII. Reduction of safflower oil under normal pressure and separation of pure linoleyl alcohol by urea adsorption. S. Masuyama (Osaka City Ind. Research Inst.). *Kagaku to Kôgyô* (Osaka) 31, 396–9 (1957). The mixed fatty acids of safflower oil were reduced with metallic sodium in cellosolve and xylene under normal pressure to mixed higher unsaturated alcohols composed mainly of linoleyl alcohol. The mixed alcohols isomerized in diethyleneglycol with alkali show an ultraviolet spectrum absorption at 268 millimicrons, thus confirming the presence of a small amount of linolenic alcohol. On passing a methyl alcohol solution of mixed alcohols through a chromatographic adsorption tube containing urea and a suitable filtering reagent, nearly pure linoleyl alcohol was obtained from the liquid passing from the tube. (*C.A.* 52, 13288)

Chemical examination of fatty alcohols. H. Étienne. *Oléagineux* 13, 123–5 (1958). Determination of aldehydes and a group of compounds sensitive to the Zeisel reaction, in the quality control of fatty alcohols obtained by catalytic hydrogenation under high pressure, is described. (*C.A.* 52, 12423)

Rapid electrotitration, in an alcoholic medium, of a free primary aliphatic amine and of its fatty-acid soap, in the presence of the corresponding amide, with particular reference to N-(hydroxyethyl)lauramide. A. Gavriloff. *Oléagineux* 13, 135–6 (1958). A rapid electrotitration method is described for determining the amine and soap present as impurities in the preparation of N-(hydroxyethyl)lauramide. The curve of the amine neutralization, in an alcohol medium, by hydrochloric acid dissolved in alcohol is obtained by means of a pH meter. Calculation is from reference curves derived from titrations on known solutions of amine and soap, respectively. (*C.A.* 52, 12424)

α-Bromo fatty acid bromides. P. Zutavern and W. Mothes (Knoll A.-G., Chemische Fabriken). *Ger. 831,239.* Reaction of fatty acid esters with bromine and red phosphorus yields the corresponding α-bromo fatty acid bromides. Thus, diethyl ketone (130 g.), 16.2 g. red phosphorus, and 415 g. bromine is refluxed 0.5 hour to give 85% α-bromopropionyl bromide. Similarly, α-bromobutyryl bromide, and α-bromoisovaleryl bromide are obtained (*C.A.* 52, 11900)

Thermal analysis of some 12-hydroxystearates. S. T. Abrams and F. H. Stross (Shell Development Co., Emeryville, Calif.). *J. Phys. Chem.* 62, 879–880 (1958). The differential thermal analysis of sodium and lithium 12-hydroxystearate and the transition temperatures are given. The total latent heat of the sodium soap changes from 12 kcal./mol. to 8 kcal. on repeated analysis. The lithium soap has a latent heat of fusion of 10.5 kcal. which does not change.

Transition temperatures of monolayers and surface viscosity of dilute aqueous solutions of lauryl alcohol in sodium lauryl sulfate. J. Ross (Colgate Palmolive Co., Jersey City, N. J.). *J. Phys. Chem.* 62, 531–3 (1958). From measurements with the Wilson and Ries surface viscometer upon solutions of lauryl alcohol in sodium lauryl sulfate, it is shown that transitions in foam and film drainage correspond to transitions in surface viscosity. The temperature above which high surface viscosity is not exhibited is reported for monomolecular films of a series of long chain alcohols.

Surface tension and surface transition of dilute aqueous solutions of lauryl alcohol in sodium lauryl sulfate. J. Ross and M. B. Epstein (Colgate Palmolive Co., Jersey City, N. J.). *J. Phys. Chem.* 62, 533–5 (1958). Surface tensions of sodium lauryl sulfate solutions are reported for systems below the critical micelle concentration and over a range of temperatures. In the presence of dissolved lauryl alcohol, definite transitions were observed. In the absence of lauryl alcohol, no transitions were observed between 15 and 45°. The process is a surface transition from a condensed to an expanded state; over the transition region calculated heats of surface extension are much higher than over adjacent regions.

Physical properties of monolayers at the solid/air interface. III. Friction and durability of films on stainless steel. R. L. Cottington, E. G. Shafrin and W. A. Zisman (U. S. Naval Research Lab., Washington 25, D. C.). *J. Phys. Chem.* 62, 513–18 (1958). The friction and wetting properties, and the durabilities of monolayers of fatty acids, fluoroalkanoic acids, and primary aliphatic amines on steel and glass are presented. Results are discussed in terms of the probable molecular structure of the monolayers.

Pellucid composition and method for coating foodstuffs. J. R. Wirt, H. C. Kelly and R. M. Krajewski (The Dow Chemical Co.). *U. S. 2,840,474.* A transparent coating composition for articles of food consists of a hot melt containing 19.0 to 28.0 parts by wt. of ethyl cellulose, 39.0 to 73.5 parts of a refined mineral oil having a Saybolt viscosity at 100°F. of 80 to 400 units, not more than about 5.0 parts of a plasticizer such as glycerol monooleate, *n*-butyl stearate or glycerol monostearate, not more than about 5.0 parts of acetylated monoglyceride, and 7.0 to 20.0 parts of castor oil.

Antimicrobial preservative. F. M. Kuen. *U. S. 2,842,441.* The preservative, for use in solutions containing perishable organic material, is an alkyl phenyl ester of a halogenated fatty acid.

Ceramic color compositions. O. A. Short (E. I. du Pont de Nemours & Co.). *U. S. 2,842,454.* A resin-free vitreous enamel color has a vehicle that is a mixture of paraffin, natural vegetable wax, aluminum stearate, phosphorated tall oil, stearic acid and stearyl alcohol.

Aminoalkyl esters of 12-ketooleic acid and 12-ketoelaidic acid. J. Nichols and E. S. Schipper(Ethicon, Inc.). *U. S. 2,842,575.* Preparation of these compounds is described.

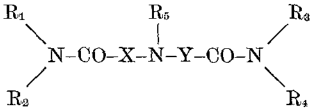
Method of preparation and purification of the higher aliphatic di-acids. C. Paquot, R. Perron and J. Petit(Etablissement Public dit: Centre National de la Recherche Scientifique). *U. S. 2,842,593.* Di-acids are prepared by the nitric acid oxidation of aliphatic esters of saturated higher fatty acids.

Preparations of amides. G. C. Tesoro(Onyx Oil & Chemical Co.). *U. S. 2,844,609.* Amides are produced by reacting at temperatures of 55° to 75° and under reduced pressure, higher fatty acid esters (lower alkanol esters of glycerides) with high boiling primary or secondary alkanolamines in the presence of sodium methoxide.

Purification of acylamino carboxylic acids. W. Freudenberg (General Aniline & Film Corp.). *U. S. 2,844,610.* Fatty acylamino compounds are formed by the reaction of an amine with a fatty acid halide in the presence of an alkali metal hydroxide at a pH above 9.5 and temperatures below 50°. At the completion of the reaction, 5 to 50% of a water-soluble alcohol is added and the mixture is acidified so the contaminants precipitate out. These are removed by filtration, and the acylamino compound is recovered by distillation.

Manufacture of acylamino carboxylic acids. W. Freudenberg (General Aniline & Film Corp.). *U. S. 2,844,611.* High yields of fatty acylamino compounds are obtained by the reaction of acyl halides with amines in the presence of alkali at a pH of about 9.5 and a water-soluble lower alcohol.

Fatty acid amides. W. F. Bruce and R. S. Hanslick(American Home Products Corp). *U. S. 2,844,629.* The compounds are di-fatty acid amides and their non-toxic, acid-addition salts having the general formula:



$$\begin{matrix} R_1 & & R_5 & & R_3 \\ & \diagdown & | & \diagup & \\ & N\text{-}CO\text{-}X\text{-} & N & \text{-}Y\text{-}CO\text{-}N & \\ & \diagup & & \diagdown & \\ R_2 & & & & R_4 \end{matrix}$$

wherein R_1, R_2, R_3 and R_4 are alkyl groups having a total of 12 to 26 carbon atoms with no radical having more than 12; R_5 is hydroxyethyl, hydroxypropyl or hydroxybutyl or the corresponding C_2 and C_4 esters; and X and Y are divalent alkylene radicals of 1 to 2 carbons.

Process for preparation of fatty alcohols. F. F. A. Braconier and H. LeBihan(Soc. Belge de l'Azote & Prod. Chim. du Marly). *U. S. 2,844,633.* Higher fatty alcohols are produced by reacting the fatty acid with an excess of methanol in the presence of a catalyst at temperatures between 325° and 375° and a pressure of at least 300 atm. The methyl ester which forms is reduced by active hydrogen resulting from the decomposition of at least part of the excess methanol and the water formed by the esterification.

• Biology and Nutrition

Oil-palm fruit carotenoids. S. Argoud. *Oléagineux* 13, 249-58 (1958). Data are presented on the carotenes of fruit samples of *Elaeis guineensis var. nigrescens* and *var. virescens.* The same pigments are found in both fruit varieties, i.e., α-, β-, ζ-, and γ-carotenes, lycopene, poly-*cis*-lycopene, prolycopene, protetrahydrolycopene, pro-γ-carotene, a mixture of *cis* isomers of tetrahydrolycopene. The α- and β-carotenes are 13–30 and 50–56%, respectively, of the palm fruit carotenes. The carotenes of the oils contain 20–25% α- and 55–65% β-carotene, those of fiber oils contain 14-20% α- and 40–50% β-carotene, depending on the fiber condition and the drying techniques used. Twenty-four references. (*C.A.* 52, 12425)

Chromatographic separation of two vitamin A_2 isomers. B. Barnholdt and W. Hjarde(Natl. Vitamin Lab., Copenhagen). *Acta Chem. Scand.* 10, 1635–48(1956)(in English). The presence of two vitamin A_2 isomers in perch and pike livers extract has been shown by chromatography. Although the absorption maximum and minimum support the idea that there are only two vitamin A_2 isomers in perch and pike livers extract, the possibility of a third vitamin A_2 isomer has not been ruled out. (*C.A.* 52, 12964)

Influence of type of activation on the fatty acids resulting from milk lipase action. P. W. Rivers(Univ. of Minnesota, Minneapolis). *Univ. Microfilms* (Ann Arbor, Mich.), *L. C. Card* No. **Mic.** 58–1138, 88 pp.; *Dissertation Abstr.* 18, 1238 (1958). (*C.A.* 52, 13129)

Peptization of peanut and coconut cake and meal proteins in pepsin solutions. E. Better and A. Davidsohn. *Oléagineux* 13, 79–83(1958). The effect of heat-treatment on the proteins of oilseed (coconut and peanut) press-cake, and solvent-extracted meal as measured by digestibility in a pepsin solution was studied. The proteins were strongly affected by the heat treatment, as indicated by their peptization by pure water and electrolyte solutions; they were also readily peptized by treatment with pepsin-hydrochloric acid solutions in the excessive ratio of 0.4 g. pepsin to 2 g. substance. When the ratio of 0.02–0.04 g. pepsin to 2 g. substance was used, the degree of peptization was related to the amount of heat-treatment. (*C.A.* 52, 12425)

Stability of vitamin A. V. A. Devyatnin, V. M. Iosikova, L. N. Kravchina, V. I. Koltunova, and I. A. Solunina. *Tekhnol. i Primenenie Vitamin A i Karotina* (Moscow)*Sbornik* **1956**, 73–80; *Referat. Zhur. Khim., Biol. Khim.* **1958**, Abstr. No. 2990. A study was made of the stability of vitamin A in ice cream, different fats, composite foods, and in vitamin A concentrates. Vitamin A was found to be highly stable in the absence of products of oxidation and of products of fat decomposition. Contact with oxygen and increase in moisture content and in the content of easily broken down components all facilitated the decomposition of vitamin A. (*C.A.* 52, 12260)

Stability of sesamolin in presence of vitamin A acetate in hydrogenated oil(Vanaspati). B. S. Dane and B. S. Anantanarayanan(Food & Agr., New Delhi). *J. Sci. Ind. Research* (India) **17C**, 18(1958). If contact with air is avoided and samples are stored in the dark, vitamin A and sesamolin stay together at room temperature without any deterioration in either constituent. Contrariwise, the samples containing sesamolin but no vitamin A when stored in the dark show a tendency towards deterioration in some instances. (*C.A.* 52, 12260)

The absorption of fats studied in a patient with chyluria. II. Palmitic and oleic acids. R. Blomstrand and E. H. Ahrens, Jr. (The Rockefeller Institute, N. Y. City). *J. Biol. Chem.* 233, 321–6(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. The data indicate that nonesterified fatty acids and absorbed acids in human lymph are largely of endogenous origin and could not be precursors of triglyceride acids in chyle.

Absorption of fats studied in a patient with chyluria. III. Cholesterol. R. Blomstrand and E. H. Ahrens, Jr. (The Rockefeller Inst., N. Y. City). *J. Biol. Chem.* 233, 327–30(1958). The absorption of dietary cholesterol C^{14} has been tested in a patient with chyluria who shunted 40% of absorbed dietary fat into her urine. Whether given with or without fat, about 20% of administered cholesterol was absorbed in 15 hours. The peak of labeled absorption occurred at 9 hours, that of fat absorption 3 hours earlier. Sixty to 80% of the cholesterol in the chyle was in the esterified form. Cholesterol absorption was reduced about 50% by the simultaneous administration of β-sitosterol. Under various conditions of fat intake, 1 to 3 g. 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 phospholipides of human bile and small intestinal contents. B. Borgström(Univ. Lund, Swed.). *Acta Chem. Scand.* 11, 749(1957). The phospholipides in the intestinal content from upper jejunum of a normal man was studied by chromatographic technique. Lysolecithin and α-palmitoyl-β-oleoyllecithin were identified. (*C.A.* 52, 12128)

Biochemistry of the polyethylenic fatty acids. K. Bernhard. *Oléagineux* 13, 19–23(1958). The distribution of the polyethylenic fatty acids in the rat liver and brains was found to be identical in spite of the age difference. A diet containing linoleic acid (such as one with sunflower oil) increased the amounts of linoleic acid in the liver lipides. The half-life time of linoleic acid was found to be twice that of erucic acid. Vitamin E appeared to have no appreciable effect on the polyethylenic fatty acids. The conversion of linoleic and linolenic acids into stearic acid was not proved. An abnormal animal structure oxidized more oleic acid than one deficient in fatty acids, under the carbon dioxide activity. A preferential and gradual synthesis of unsaturated fatty acids is produced by *Phycomyces blakesleanus.* Twenty-two references. (*C.A.* 52, 12123)

Effects of dietary fats on serum lipide levels in man. E. H. Ahrens, Jr., J. Hirsch, W. Insull, Jr., M. L. Petterson, and W. H. Sebrell, Jr.(Rockefeller Inst., New York, N. Y.). *Trans. Assoc. Am. Physicians* **70**, 224–33(1957). Dietary fat can alter the concentration of serum lipides. Triglyceride fatty acids, not unsaponifiable fraction, are responsible for these changes. The quantity of ingested fat produced major changes in serum triglycerides; length of the fatty-acid chain and the iodine number are related to changes in concentration of cholesterol and phosphatides. With these changes in serum lipides marked changes also occur in the composition of the fatty acids with which they are esterified. These dietary effects may be related to changes in the excretion of cholesterol. (*C.A.* **52**, 12112)

Effect of the nature of alimentary fats on the growth and breeding of white rats. J. Raulin. *Oléagineux* **13**, 193–7(1958). A study was made of relation between the nature of fats and the effects of an excessive amount of cholesterol administered in six diets to female white rats. The nature of the diet fat was shown to influence the cholesterol effects. The presence or absence of cholesterol definitely changed the effectiveness of the fat with respect to the growth and breeding of the rats. The highest rate of growth prevention occurred when both cholesterol and sunflower oil were used in the diet. The association of cholesterol with free fatty acids proved to be toxic and dangerous; the fats for consumption should, therefore, be neutral. (*C.A.* **52**, 12110)

Influence of digestion and resorption processes on the toxicity for rats of some fatty mixtures. Géneviève Clément, J. Clément-Champougny, and J. Raulin. *Oléagineux* **13**, 107–12(1958). A study was made to find out whether the toxicity of the association of free fatty acids with cholesterol produced anomalies in the nature and distribution of lipides with respect to absorption, transportation, and hepatic metabolism. The toxic effect produced in rats by a diet containing free unsaturated fatty acids, an excess of cholesterol and 0.05% choline chloride corresponded to a decrease of hepatic phosphatides and to the appearance of phosphatides in the intestinal contents, which were partly eliminated by feces. The phosphatide loss caused a decrease of choline in the system. A detailed examination of the lipides of the intestinal contents showed the interdependence of the digestion and absorption processes and the important role of lipase in this respect. (*C.A.* **52**, 12110)

Presence of relatively saturated soaps at various stages of lipide digestion, resorption, and transportation. Jacqueline Clément-Champougny and G. Clément. *Oléagineux* **13**, 103–5 (1958). Appreciable amounts of soaps were found in the intestinal contents and lymph; smaller amounts were located in the intestinal mucous membrane, feces, and serum. The soap fatty acids were more saturated than the free and esterified ones (glycerides, cholesterol esters, phosphatides); the same result was noticed when a mixture of differently saturated fatty acids was in a medium containing electrolytes in the absence of enzymes. (*C.A.* **52**, 12110)

Physiological role of the polyethylenic fatty acids. E. Le-Breton. *Oléagineux* **13**, 25–31(1958). The author outlines the symptoms in rats of a deficiency in essential fatty acids, states that these acids are mainly located in phospholipides and cholesterol esters, and reviews the literature on their role in the nervous system. Thirty-two references. (*C.A.* **52**, 12110)

Determination of vitamin E in wheat germ oil. Comments to the communication of H. Koch and W. Ponsold. W. Feldheim (Inst. Vitaminforschung Vitaminprüfung, Potsdam-Rehbrücke, Ger.). *Pharm. Zentralhalle* **95**, 53–6(1956). Biological activity of α-, β-, γ-, and δ-tocopherol in the rat is in the proportion 100:40:8.3:1. In most plant sources the α-isomer tocopherol is the principal constituent. However, in wheat germ and its oil β-tocopherol constitutes 30% of total tocopherol, while in a few other raw materials such as soybeans α-tocopherol makes up only 10% of total. Since tocopherol is soluble in naturally occurring fats, saponification must precede oxidation with alcohol ferric chloride and optical measurement of the red complex formed with α,α'-bipyridine. Sources of error are companion substances, such as vitamin C, carotenoids, and other dyes, which should be removed by adsorption on fluoridin. (*C.A.* **52**, 12316)

Combined β-sitosterol and linoleic acid regimen for cholesterol-fed rabbits. O. J. Pollak(Kent Gen. Hosp., Dover, Del.). *J. Gerontol.* **13**, 140–3(1958). A total of 198 rabbits were fed for 14 days in addition to a basic chow diet cholesterol, a placebo-solvent, sitosterol (a mixture of β- and dihydro-β-sitosterol), and linoleic acid, singly or in various combinations and doses. One g. cholesterol per day increased serum cholesterol from 57 to 405 mg. %; feeding sitosterol in addition to cholesterol at levels of 1, 3, and 7 g. per day reduced serum cholesterol to 226, 133, and 49 mg. %, respectively, while feeding linoleic acid at 1, 5, and 11 g. per day reduced it to 248, 85, and 53 mg. %, respectively. The effective anticholesterolemic ratio was 7 parts sitosterol or 11 parts linoleic acid to 1 part dietary cholesterol. By combined use in optimal amounts sitosterol dosage can be reduced by 57% and linoleic acid from 50 to 78% as compared with each substance administered alone. Blood level of cholesterol in rabbits fed 1 g. cholesterol per day for 14 days remain stable with simultaneous administration of 3 g. sitosterol and 2 g. linoleic acid. (*C.A.* **52**, 12111)

Milk fat and cholesterol. W. Halden. *Österr. Milchwirtsch.* **13**, 99–100(1958). Addition of 500 g. whole milk, 120 g. Gervais cheese, 160 g. Swedish cracked bread containing 3% lecithin, and 100 mg. vitamin C to the normal diet of students resulted in a decrease of the cholesterol content of the blood serum. (*C.A.* **52**, 13031)

The estrogenic action of various fats. J. Vague, J. C. Garrigues, J. Berthet, and G. Favier. *Ann. endocrinol.* (Paris) **18**, 745–51 (1957). In studies on humans, the results indicate that various fats of vegetable and animal origin contain significant amounts of estrogens. The chemical nature of the substances has not been established. (*C.A.* **52**, 13029)

Role of dietary fat in human health. P. L. Day, *et al. Natl. Acad. Sci.-Natl. Research Council,* Publ. No. **575**, 32 pp. (1958). A review with 139 references. (*C.A.* **52**, 13029)

Effect of fatty acids on the proteolysis of proteins. I. Effect of C_6–C_{14} fatty acids on the tryptic digestion of ovalbumin. M. Kondo(Univ. Tokyo). *J. Biochem.* (Tokyo) **45**, 151–8 (1958). The presence of 0.15 molar caprylic acid, 0.05 molar capric acid, 0.015 molar lauric, or myristic acid increased the susceptibility of ovalbumin to trypsin as much as heat treatments did. Caproic acid was not effective even at a concentration of 0.4 molar. A higher concentration (greater than 0.1 molar) of caprylic or capric acid or that (greater than 0.05 molar) of capric and myristic acids exhibited an inhibitory effect. The increase in levorotation of ovalbumin by fatty acid was determined. The maximum values of specific rotation were higher in order in 0.015 molar lauric acid, 0.05 molar capric, and myristic acids; neither caprylic nor caproic acid showed any effect. (*C.A.* **52**, 13029)

Separation and identification of methyl esters of saturated and unsaturated fatty acids from n-pentanoic to n-octadecanoic acids. A. T. James and A. J. P. Martin. *Biochem. Problems Lipids, Proc. Intern. Conf., 2nd, Ghent,* **1955**, 42–8(Pub. 1956). (*C.A.* **52**, 11662)

Quantitative paper chromatography of lipide constituents. June Olley. *Ibid.* 49–55. (*C.A.* **52**, 12052)

Interaction of serum albumin with fatty acid multilayers. H. Sobotka. *Ibid.* 108–14. (*C.A.* **52**, 12016)

Measurement of total body fat in man by absorption of cyclopropane. G. T. Lesser, A. G. Blumberg, and J. M. Steele. *Ibid.* 373–83. (*C.A.* **52**, 12052)

Lipoxidase-catalyzed oxidation of polyunsaturated fatty acids. W. O. Lundberg. *Ibid.* 407–11. (*C.A.* **52**, 12017)

Dietary factors in the oxidation and synthesis of fatty acid by tissue preparations. C. Artom. *Ibid.* 430–7. (*C.A.* **52**, 12116)

The biological value of various natural oils and fats. H. J. Thomasson. *Ibid.* 452–62. (*C.A.* **52**, 12117)

Vitamin F activity of highly unsaturated fatty acids from human brain glycerophosphatides. H. de Iongh. *Ibid.* 472–5. (*C.A.* **52**, 12131)

Degree of unsaturation of fatty acids liberated in the course of lipolysis in vivo and in vitro of the rat by the pancreatic juice. G. Clément and L. Clément. *Ibid.* 306–14. (*C.A.* **52**, 13053)

Fatty acid exchanges during fat digestion in the human intestine. E. H. Ahrens, Jr. and B. Borgström. *Ibid.* 315–22. (*C.A.* **52**, 13053)

Absorption of fat. A. C. Frazer, W. F. R. Pover, H. G. Sammons, and R. Schneider. *Ibid.* 331–40. (*C.A.* **52**, 13054)

Absorption and distribution in the rat of lipides utilizing labeled glycerides and components. Margaret G. Morehouse, W. P. Skipski, R. L. Searcy, and L. Spolter. *Ibid.* 341–6. (*C.A.* **52**, 13054)

Assimilation of fatty acids by adipose tissue. B. Shapiro, I. Chowers, and G. Rose. *Ibid.* 347–52. (*C.A.* **52**, 13054)

Absorption and metabolism of sterols; mode of absorption. J. Glover, C. Green. *Ibid.* 359–64. (*C.A.* **52**, 13055)

Esterification of cholesterol and serum lipoproteins. F. Tayeau and R. Nivet. *Ibid.* 365–9 (*C.A.* **52**, 13055)

Hepatic lipides of cellular structures. G. Clément, J. Clément-Champougny, and E. LeBreton. *Ibid.* 385–94. (*C.A.* 52, 13074)

The mechanism of the lipotropic action of choline; the influence of choline and betaine in the absence of choline oxidase. C. S. Rossi. *Ibid.* 438–43. (*C.A.* 52, 13055)

Symposium on the mode of action of lipotropic factors in nutrition. Introduction. R. E. Olson. *Am. J. Clin. Nutrition* 6, 197–9(1958).

Biosynthesis of choline and betaine. J. A. Stekol(Lankenau Hosp. Research Inst., Philadelphia, Pa.). *Ibid.* 200–14.

Biosynthesis of phospholipides. E. P. Kennedy(Univ. of Chicago). *Ibid.* 216–19.

Role of choline in the hepatic oxidation of fat. C. Artom (Wake Forest Coll., Winston-Salem, N. C.). *Ibid.* 221–33.

Role of choline in the turnover of phospholipides. D. B. Zilversmit and N. R. DiLuzio(Univ. of Tennessee, Memphis). *Ibid.* 235–40.

Nutritional fatty livers in rats. A. E. Harper(Univ. of Wisconsin, Madison). *Ibid.* 242–51.

Role of choline and methionine antagonists in metabolism. I. C. Wells(State Univ. of New York, Syracuse, N. Y.). *Ibid.* 254–60.

Renal lesions in choline deficiency. W. H. Griffith(Univ. of California, Los Angeles). *Ibid.* 263–70.

Vascular disease associated with choline deficiency in the rat. G. F. Wilgram(Univ. Toronto, Can.). *Ibid.* 274–8.

Fatty liver in man and the role of lipotropic factors. G. J. Gabuzda(Western Reserve Univ., Cleveland, O.). *Ibid.* 280–93.

Fatty liver in children: kwashiorkor. S. Frenk, F. Gómez, R. Ramos-Galván, and J. Cravioto(Hosp. Infantil, Mexico, D. F.). *Ibid.* 298–307.

Effect of low-protein diets upon serum cholesterol in man. R. E. Olson, J. W. Vester, D. Gursey, N. Davis, and Doris Longman(Univ. of Pittsburgh, Pittsburgh, Pa.). *Ibid.* 310–21.

Effect of lipotropic factors upon serum lipides and vascular disease in man. T. D. Labecki(Mississippi State Board of Health, Jackson). *Ibid.* 325–30. (*C.A.* 52, 13028)

Analysis of the lipides of α- and β-lipoproteins of the plasma. J. Polonovski, M. Jarrier, M. Petit, and C. Dupuy(Fac. Méd., Paris). *Ann. biol. clin.* (Paris) 16, 69–72(1958). When 0.08 ml. of a 10% solution of dextran sulfate was added to a 2-ml. sample of serum and centrifuged, the β-lipoproteins were precipitated while the α-lipoproteins remained in the supernatant solution. Lipides were separated from each of the fractions, first by extraction with methyl alcohol and chloroform, then by treatment of the extract with acetic acid, methyl alcohol, and petroleum ether which separated the neutral fats from the phospholipides. (*C.A.* 52, 12971)

Alimentary effect of fats on blood lipides and on blood coagulation in arteriosclerosis. E. Greppi(Univ. Florence). *Bull. schweiz. Akad. med. Wiss.* 13, 330–6(1957)(in French). Atheromatous patients and normal individuals were given 50 g. butter per day in addition to their standard diet. While a single administration of butter caused marked changes in blood coagulation time and in prothrombin activity, prolonged administration over several days produced mostly coagulation changes only. These changes were found to be considerably stronger in the older atheromatous patients than in the younger control individuals. (*C.A.* 52, 13035)

The constitution and stability of lipoproteins. F. Tateau. *Koninkl. Vlaam Acad. Wetenschap., Letter. en Schone Kunsten Belg., Kl. Wetenschap., Intern. Colloq. Biochem. Problem. Lipiden, 3, Brussels,* 1956, 35–52. (*C.A.* 52, 12952)

Chromatographic separations of serum lipoproteins on glass powder columns. L. A. Carlson. *Ibid.* 113–22. (*C.A.* 52, 12976)

Determination of esterified fatty acids and the detection of sphingomyelin in blood. M. Eggstein. *Ibid.* 150–63. (*C.A.* 52, 12976)

The electrophoresis of lipoproteins of blood serum. W. Geinitz. *Ibid.* 164–7. (*C.A.* 52, 12976)

Action in vitro of alkyl sulfates on the extraction of blood serum lipides. C. Magis. *Ibid.* 173–9. (*C.A.* 52, 12976)

Purification and characterization of a lipemia-clearing factor inhibitor from normal plasma. C. Hollett and H. C. Meng. *Ibid.* 190–9. (*C.A.* 52, 12977)

Lipoprotein lipase. E. R. Korn and T. W. Quigley. *Ibid.* 255–64. (*C.A.* 52, 12952)

The exchange of lipides between the circulating plasma and the hepatic lymph. B. Morris. *Ibid.* 311–22. (*C.A.* 52, 13056)

Observations upon the removal of chylomicra from the blood. J. E. French, B. Morris, and D. S. Reynolds. *Ibid.* 323–31. (*C.A.* 52, 13056)

Deficiency of essential fatty acids in relation to coronary thrombosis. H. M. Sinclair. *Ibid.* 392–400. (*C.A.* 52, 13074)

Changes in serum lipides dependent upon hormones in liver disorders both in experimental animals and from a clinical viewpoint. H. Seckfort and W. Busanny-Caspari. *Ibid.* 416–18. (*C.A.* 52, 13074)

Toxicological studies on sesamol. A. M. Ambrose, A. J. Cox, Jr., and F. DeEds(Western Utilization Res. and Dev. Div., Agr. Res. Service, U. S. Dept. of Agr., Albany 10, Calif., and Dept. of Path., Stanford Univ., School of Med., San Francisco, Calif.). *J. Agr. Food Chem.* 6, 600–04(1958). Sesamol, a constituent of sesame oil, possesses antioxidant properties, and is at least partly responsible for the stability of this important oil. Sesamol can now be produced commercially and is a potentially useful antioxidant. Extensive toxicological investigations have shown that it is nonirritant to the skin and does not cause skin sensitization. Long-term feeding of twice recrystallized sesamol to rats had no effect on growth, mortality, or blood morphology. Deposits of pigment occurred in the kidneys of the female rats but were unrelated to the dietary levels of sesamol. A total of 20 proliferative lesions occurred in 134 rats fed sesamol. Sixteen of the lesions were benign, two were malignant, and two were questionable. No such lesions were found in the controls, nor in rats receiving the two lowest dosages of sesamol.

The interaction of human serum albumin with long-chain fatty acid anions. D. S. Goodman(Lab. of Cellular Phys. and Metabolism, Nat. Heart Inst., Nat. Insts. of Health, Bethesda, Md.). *J. Am. Chem. Soc.* 80, 3892–8(1958). The interaction of human serum albumin with 6 long-chain fatty acid anions has been studied by the technique of partition analysis, in which varying quantities of each fatty acid were equilibrated between 2 phases. The phases employed were *n*-heptane and an aqueous solution of serum albumin in phosphate buffer, pH 7.45, ionic strength 0.16 at 23°. The concentration of unbound fatty acid in each aqueous phase was determined from the concentration in heptane, using the results of identical distribution experiments performed in the absence of albumin. The fatty acids studied included lauric, myristic, palmitic, stearic, oleic, and linoleic acids. The human serum albumin was a special preparation with a fatty acid content of 0.1 mole/mole or less.

Protection of fungi against polyene antibiotics by sterols. D. Gottlieb, H. E. Carter, J. H. Sloneker, A. Ammann(Depts. Plant Path. and Chem., Univ. Ill., Urbana). *Science* 128, 361 (1958). The prevention of the antifungal activity of filipin by sterols has some interesting implications. Evidently, sterols play a much more important role in the growth processes of fungi than has hitherto been suspected. While a few microorganisms have been shown to require sterols for growth, studies indicate that such substances are probably essential metabolites for many fungi.

Determination of polyunsaturated acids in lipides of plasma and tissue. R. T. Holman and H. Hayes(Hormel Inst. and Dept. of Physiological Chem., Univ. of Minn., Austin, Minn.). *Anal. Chem.* 30, 1422–1425(1958). A micromethod for determination of polyunsaturated acids in 1 gram of tissue or a few milliliters of plasma has been developed. The optimum conditions of isomerization were determined upon pure polyunsaturated acids, and constants were established for the calculation of the various polyene types. Reproducibility of isomerization varies between 2 and 10% for the various polyenes. Nonacid polyenes have been isomerized to determine possible interference by unsaponifiable matter containing polyunsaturated materials.

The metabolic fate of carbon-14-labeled trimethylalkyl ammonium stearate. M. S. Mameesh, H. E. Schendel and B. C. Johnson(Div. Animal Nutrition, Univ. of Ill., Urbana, Ill.). *J. Agr. Food Chem.* 6, 619–20(1958). Trimethylhexadecyl ammonium stearate labeled with carbon-14 in the one position of the hexadecyl chain has been administered to rats orally, as a diet ingredient, and by injection intraperitoneally. This compound is highly insoluble in water and, therefore, appeared unlikely to be absorbed from the intestinal tract or metabolized by the body, when given by injection. However, the compound was absorbed from the intestinal tract of both species to a small extent, and the absorbed fraction was rapidly metabolized and excreted by way of the gastrointestinal tract, urine, and respiratory carbon dioxide. Absorption of the compound appeared to be higher in the chick, but concentration of the label in the tissues was similar in both species.

Growth promotion in pea epicotyl sections by fatty acid esters. B. B. Stowe(Biol. Labs., Harvard Univ., Cambridge, Mass.).

Science 128, 421–2(1958). In an investigation of failure of excised sections to grow optimally, fatty acid esters have been found to bring about section growth promotions much larger than any previously reported in this standard auxin bioassay material.

The structure of the naturally occurring phosphoglycerides. 4. Action of cabbage-leaf phospholipase D on ovolecithin and related substances. Flora M. Davidson and C. Long(Dept. Biological Chem., Univ. Aberdeen). *Biochem. J.* 69, 458–66 (1958). A soluble phospholipase D was isolated from the yellow "heart" of Savoy cabbage. It acts readily on ovolecithin, egg phosphatidylethanolamine and other phosphoglycerides possessing the L-α structure. It has a smaller activity towards synthetic substrates with the DL-α or -β structure. With these substrates, the enzyme required both ether and calcium ions. The slow enzymic hydrolysis of lysolecithin was promoted by calcium ions but inhibited by ether. Enzymatic activity was stimulated by diphenyl phosphate, di-*p*-nitrophenyl phosphate and glycerylphosphorylcholine.

Diet and atherosclerotic disease. II. Animal experimental research. J. Stamler(Cardiovascular Dept., Medical Research Inst., Michael Reese Hosp., Chicago). *J. Am. Dietet. Assoc.* 34, 814–18(1958). This topic is reviewed under the following headings: production of atherosclerosis in different species, animal studies on unsaturated fatty acids, deficiency of essential fatty acids, and dietary interrelationships and cholesterolemia and atherogenesis. It is concluded that prolonged ingestion of diets combining excess of cholesterol, lipids, saturated lipids and calories may be especially pernicious in their hypercholesterolemia-inducing and atherogenic effects. The apparent discrepancies between the results of animal and human studies may be ascribable to differences in experimental design. The effects of hormones, protein, carbohydrate, total fat, calories, lipotropic agents and minerals are mentioned.

Influence of cobaltous chloride on aortic atheromatosis and plasma lipid pattern in cholesterol-fed chickens. D. M. Tennent, C. W. Mushett, G. W. Kuron, W. H. Ott, and H. Siegel (Merck Institute for Therapeutic Research, Rahway, N. J.). *Proc. Soc. Exptl. Biol. Med.* 98, 474–7(1958). Cockerels were fed a diet containing 2% cholesterol and 5% cottonseed oil for eight weeks. Addition of 0.05% cobaltous chloride to this diet reduced the incidence and severity of aortic lesions and caused blood cholesterol concentrations to be lower than in the controls. The amount of cholesterol in the β-lipoprotein was decreased. There was no consistent effect on lipid phosporus concentrations. Cobalt in the diet did not seem to influence activity of the thyroids. When fed or administered intravenously, cobalt did not change the structure of the pancreatic α-cells. Subcutaneous injection of cobaltous chloride generally increased the incidence and severity of aortic lesions and concentration of cholesterol in blood. It is concluded that the effect of cobalt in the diet of cholesterol-fed chicks is the result of local action in the intestinal tract.

Abnormal fat absorption in tumor-bearing rats. I. Posner(Surgical Research Metabolic Lab., Georgetown Univ. Hospital, Washington, D. C.). *Proc. Soc. Exptl. Biol. Med.* 98, 477–9 (1958). Male Sprague-Dawley rats were maintained on isocaloric, synthetic diets. Animals bearing implants of Walker carcinoma were allowed to eat *ad libitum* while controls were pair fed. Tumors were allowed to grow to 15 to 18% of body weight. After thoracic duct cannulation , I^{131} labeled triolein was administered by stomach tube. The amount of fat recovered from the thoracic duct lymph of the tumor-bearing rats was significantly less than that recovered from the lymph of normal and pair-fed control rats.

Bile acid metabolism, dietary fats, and plasma cholesterol levels. S. O. Byers and M. Friedman(Harold Brunn Institute, Mt. Zion Hospital, San Francisco, Calif.). *Proc. Soc. Exptl. Biol. Med.* 98, 523–6(1958). In rats almost twice as much sterol was found in the lymph after administration of cholesterol in either soybean oil or corn oil as was found when cholesterol was administered in lard or coconut oil. Even in as short a period as seven days, a diet containing walnut oil resulted in plasma cholesterol values significantly below those found in rats given a diet containing coconut oil or a diet containing neither fat nor sterol. Excretion of bile cholesterol was significantly higher in rats fed walnut oil. The total amount of cholate excreted by rats given walnut oil was twice that observed in rats fed a sterol-free diet and 26% greater than that excreted by rats given coconut oil.

Relationship of fluoride and dietary fats to serum cholesterol in rats. W. Buttner and J. C. Muhler(Dept. Chem., Indiana Univ., Bloomington). *Proc. Soc. Exptl. Biol. Med.* 98, 620–2 (1958). Rats were fed isocaloric diets containing 5 or 20% cottonseed oil, or 20% corn oil, Crisco or lard. Throughout a ten-week period, 2 mg. fluoride was administered daily. There was no significant overall change in serum cholesterol levels although there were wide, temporary fluctuations. Comparison of body weight gains indicated that none of the fats increased fluoride toxicity.

Plasma cholesterol in growing chickens as influenced by dietary protein and fat. G. A. Leveille and H. Fisher(Dept. Poultry Science, Rutgers Univ., New Brunswick, N. J.). *Proc. Soc. Exptl. Biol. Med.* 98, 630–2(1958). Fats used in this study were olive oil, corn oil, and mixtures of coconut oil with cottonseed or safflower oil. The diets contained 8 or 25% soybean protein and were supplemented with 0.3 and 2% cholesterol, respectively. Chicks were kept on the experimental diets for periods of 16 days. On the low-protein diet there was a marked hypercholesterolemia which was not affected by type of fat or level of supplementation. On the high protein diet, plasma cholesterol levels were essentially normal regardless of source and level of dietary fat.

Inhibition of lipemia clearing activity by tissue extracts. E. Klein, W. F. Lever, and L. L. Fekete(Dept. Dermatology, Harvard Medical School, Mass. General Hospital, Boston). *Proc. Soc. Exptl. Biol. Med.* 98, 658–60(1958). Extracts of human and rabbit tissues inhibited heparin-induced lipemia clearing activity of serum. Inhibitiion was least in tissues which normally have a high fat content or which represent sites of pathological deposition of lipids. Extracts of spleen, kidney and liver were strongly inhibitory. The inhibitory agent was associated with proteins, was heat-labile, non-dialyzable, and inactivated by trypsin.

Mycological formation of fat. V. Factors which influence the formation of fat in surface cultures of Penicillium lilacinum. Thom. S. E. Philip and T. K. Walker(Manchester Coll. Science & Technol., Univ. Manchester). *J. Sci. Food Agr.* 9, 223–7 (1958). When *P. lilacinum* Thom was grown as surface cultures in a defined medium containing sucrose, essential mineral salt and sodium nitrate, it produced fat in very high yield: 54.5 g. fat/100 g. felt, and 17.4 g. fat/100 g. sucrose consumed. Replacement of the sucrose with glucose, fructose, maltose, xylose, starch and dextrin gave, respectively, 10.1, 11.4, 8.4, 8.6, 3.7, and 3.8 g. fat/100 g. sugar.

Lipoxidase activity by cup-plate techniques. J. A. Blain and J. P. Todd(Dept. Food. Sci., Royal Coll. Science & Technol., Glasgow, C. I.). *J. Sci. Food Agr.* 9, 235–41(1958). Conditions for the assay of soya lipoxidase by a cup-plate technique with a linoleate-carotenoid substrate are described. The method seems to be suitable for the estimation of lipoxidase in soya extracts but not wheat extracts or haematin-containing mixtures.

Biscuit stability, the effect of oxidative changes of certain natural and synthetic antioxidants. F. J. H. O'ɩaway and J. B. M. Coppock(Baking Industries Research Station, Chorleywood, Herts.). *J. Sci. Food Agr.* 9, 294–9(1958). Three ways of protecting baked products against oxidative rancidity are discussed: incorporation of an antioxidant before baking, packaging of the product in an antioxidant-impregnated wrapper, and coating of the product with an antioxidant. Factors influencing shelf life include the nature of the fat, raising-agent residues, flour extraction rate, moisture content, and trace-metal content. Some data are shown for each. Dodecyl gallate alone or BHA used with a synergist appeared to give maximum protection; BHT was somewhat inferior. Soya flour had insignificant antioxidant value. Soya lecithin was a pro-oxidant. Bran seemed to carry most of the antioxidant power of wheat. Legal restrictions on the use of antioxidants are mentioned.

Method of cooking potato chips. A. Salvo. *U. S. 2,836,496.* A process of frying potato chips is described in which the oil is heated in chamber separate from the cooking zone.

Edible composition of vegetable oil emulsion and butter fat emulsion convertible by aeration into a stiff mass. H. M. Levin. *U. S. 2,836,497.* A method of making a dense, foamy food dressing is described. A stabilized semi-plastic, edible vegetable oil emulsion having water as its continuous phase is mixed with an edible, liquid butter fat emulsion in which water is the continuous phase. The mixture is packaged with an edible gas under high pressure.

Dry stable feed composition. C. W. Stewart(Corn Products Refining Co.). *U. S. 2,841,495.* A dry feed composition containing carotenoid pigments which is stable against oxidative deterioration is prepared by adsorbing the carotenoids on a spent vegetable oil meal and coating this with a mixture of steep liquor with any of the following: corn sirup, dextrose greens, molasses, and mixtures thereof.

Pressurized salad dressing. D. Melnick and J. Akerboom. *U. S. 2,844,469.* A salad dressing for dispensing from a pressurized container is an aqueous 20 to 50% emulsion of a hydrogenated vegetable fat. The fat has a melting point between 80° and 110°F. and a setting point between 51° and 90°F. The emulsion is acidified with an edible organic acid to a pH of about 3 to 5, and is stabilized with an edible emulsifying agent.

Pressurized food dressing. J. Akerboom and D. Melnick(The Best Foods, Inc.). *U. S. 2,844,470.* The dressing is a stable aqueous emulsion containing water-soluble, pasteurized egg yolk and 20 to 50% by wt. of a fat having a melting point between 80° and 120°F. and a setting point between 55° and 90°F.

• Drying Oils and Paints

Catalytic polymerization of linseed oil by boron fluoride. J. Cazès. *Oléagineux* 13, 93–4(1958). The use of 1–2% boron fluoride as a catalyst in linseed oil polymerized by heating in a closed container, under a nitrogen atmosphere and reduced pressure, enabled one to cut appreciably the temperature and time of the reaction. There was a critical temperature above which the reaction became exothermic. Boron fluoride favored the formation of trimer acids and exerted an isomerizing action, with the formation of quick-drying products. It also had a dehydrating action and the stand oils thus obtained had red to brown shades which disappeared on drying. (*C.A.* 52, 12417)

Some causes of the yellowing of stand oils during their manufacture. G. Balbi. *Oléagineux* 13, 63–4(1958). The yellowing of stand or heat-bodied drying oils (linseed, grape-stone, sunflower, soya, etc.) may be caused by (a) too high a processing temperature (above 285° triglycerides of saturated fatty acids decomposed), (b) presence of traces of soap or Fuller's earth from alkali refining, (c) dissolution of manganese from poor-quality stainless steel equipment. The author outlines some ways of overcoming these difficulties and describes a simple test for determining whether a refined drying oil will yield a light-colored stand or heat-bodied oil. (*C.A.* 52, 12418)

Polymer acids of drying oils. J. Petit. *Oléagineux* 13, 185–6 (1958). A discussion of the chemical structure and preparation of polymer acids. It is shown how, from the polymer acids of stand linseed oil, pure dimer and trimer esters can be separated. (*C. A.* 52, 12418)

Use of Bulgarian tall oil in paint and varnish making. G. Rankov, A. Popov, and D. Chobanov. *Compt. rend. acad. bulgare sci.* 10(6), 469–72(1957). Varnishes were made from stand oils which were made from raw tall oil and from glycerol esters of the distilled fractions of the oil, respectively. Water resistance and adhesion to aluminum were the best for varnishes made from glycerol esters of the re-distilled fractions. Impact resistance of varnish from raw tall oil was inferior to that from the esters. It was concluded that small amounts of other drying oils should be added to tall oil and its derivatives to make them suitable for use in varnishes. (*C.A.* 52, 12415)

Dibutyltin dicarboxylic acid esters. T. M. Andrews, F. A. Bower, B. R. LaLiberte and J. C. Montermoso(Chem. and Plastics Div., Q. M. R. & E. Command). *J. Am. Chem. Soc.* 80, 4102–4(1958). The preparation of a number of dibutyltin dicarboxylic acid esters, potentially useful in the synthesis of organometallic elastomers, is described. Dibutyltin oxide and dibutyltin diacetate were found to react readily with linear and cyclic dicarboxylic acids and anhydrides to form identical derivatives. Both reaction and structure studies indicate that the combining reaction is in the molar ratio of 1:1 regardless of the initial proportions used. Whereas such short chain aliphatic acids as succinic and adipic give soluble cyclic derivatives of low molecular weight, oxalic acid yields an insoluble, infusible product that has the characteristics of a hydrated salt. The cyclic terephthalic and the long chain sebacic acids, however, give linear polymers. The molecular weights vary from that of dimers to the order of 3000 for the sebacic acid product.

Esterification of methylolated rosin. J. C. Minor and R. V. Lawrence(Naval Stores Station, U. S. Dept. of Agr., Olustee, Fla.). *Ind. Eng. Chem.* 50, 1127–30(1958). To increase utilization of rosin, its reaction with formaldehyde and esterification of the reaction products were studied. Much of the formaldehyde adds to the rosin as methylol groups. The alcohol groups thus introduced were esterified with drying oil fatty acids and also interesterified with drying oils. In some respects, the varnishes thus formed were superior to those made from ester gum and linseed oil. This provides a new method for preparing surface coating materials from rosin and drying oils.

Glyceride oils and their derivatives in the plastics and rubber industries. N. Jagannathan(Univ. Bombay, India).*Paintindia* 8(1), 57–58(1958). The uses of glyceride oils and derivatives in plastics and rubber are reviewed.

D. C. O. varnishes and alkyds from castor oil. M. A. Sivasamban, S. Neelakant Rao, N. Bhojraj Naidu, and S. A. Laletore (Regional Research Lab., Hyderabad, India). *Paintindia* 8(1), 47–50(1958). The use of monomeric dehydrated castor oil in varnishes and alkyds is shown to be advantageous.

Mechanism of metal protection by paints. R. S. Saxena(T.D.E. Labs., Kanpuh, India). *Paintindia* 8(1), 86–97(1958). Since corrosion of a metal surface is an electro-chemical process, paint films insulate the surface because of their high electrolytic resistance. When immersed in a solution of electrolytes, they take up a charge which restricts their permeability to ions of like charges. Pigments function to decrease the vapor permeability of the film and to suppress the anodic or cathodic reactions on the metal surface.

Safflower oil as a varnish constituent. E. V. A. Chari and B. S. Kuikarni(Osmania Univ., Hyderabad–Dn, India). *Paintindia* 8(1), 76–77(1958). The drying, bodying and varnish-making properties of a sample of safflower oil shows it to dry in the same time as linseed oil, to body at a slower rate and to form an ester gum varnish slightly inferior in alkali resistance to a linseed oil varnish.

Effect of pigments on the rate of drying of linseed oil with and without driers. N. S. Bharatia and S. H. Desai(Elephant Oils Mills pvt. Ltd. Bombay, India). *Paintindia* 8(1), 73–74(1958). Pigments have an effect on the drying time of linseed oil but if driers are added, the effects may be reversed. Pigments such as Sb_2O_3 prevent the drying of the oil even with driers present.

Glyceride oils in electrical insulation. A. B. Gersappe(Univ. Bombay, India). *Paintindia* 8(1), 61–70(1958). The use of glyceride oils as insulants for transformers, etc. is described and the requirements for specific purposes outlined. The use of drying oils for the preparation of flexible insulators has limitations.

Languages and the paint trade, a Russian glossary. A. J. Gibson. *Paint, Oil and Colour* 133, 1348–1355(1958). A glossary of English-Russian terms used in the paint industry. *Ibid.* 134, 26–32(1958). Russian-English terms used in the paint industry.

The autoxidation of methyl elaeostearate. R. N. Faulkner (Paint Research Station, Waldegrave Rd., Teddington, Middlesex). *J. Applied Chem.* 8, 448–58(1958). Methyl α-elaeostearate was autoxidized at 37° under ultraviolet light. The product obtained after 0.6 mole of oxygen per mole of ester had been absorbed was fractionated by molecular distillation, low temperature crystallization, and solvent extraction. A crystalline monomeric peroxide was isolated that appeared to be a mixture of two isomeric forms of 1:4-peroxide. The liquid monomeric fraction was a mixture containing 1:4-, 1:2-, and 1:6-peroxides together with hydroxy and keto compounds. The polymeric fraction, obtained in low yield, contained trimers and possibly higher polymers which were reducible by hydrogen iodide.

Surface coated calcium carbonate pigments. L. M. Liggett (Wyandotte Chemicals Corp.). *U. S. 2,841,504.* The rubber reinforcing properties of calcium carbonate are improved by coating particles of this pigment with a mixture consisting of (1) higher primary C_{10}–C_{18} alkyl amines or rosin amines, and (2) an organic acid selected from the group consisting of C_{10}–C_{20} fatty acids, rosin acids, lower esters of rosin acids and metallic salts of rosin acids.

Coating compositions. J. R. Sackett(E. I. du Pont de Nemours & Co.). *U. S. 2,842,285.* A baking interior coating for steel cans is prepared from a heat-bodied glyceride drying oil and a varnish resin selected from the class consisting of maleic acid modified ester gums and heat-reactive polymerized petroleum hydrocarbon resins. This mixture is applied as a solution in a volatile organic solvent acidified with orthophosphoric acid.