ABSTRACTS . . . R. A. REINERS, Editor

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• Oils and Fats

Kinetics for the oxidation of fats. D. G. Knorre, Yu. N. Lyaskovskaya, and N. M. Emanuel. *Izvest. Akad. Nauk S. S. S. R. Otdel. Khim. Nauk* **1957**, 678–83. During the induction period of autoxidizing lard, the activation energy of the process is 20–5 kilocalories, hereafter 14.5 kilocalories. Added antioxidants prolong the induction period without changing the value of the activation energy. (*C.A.* **52**, 4212)

Determination of paper-chromatographically separated long-chain carboxylic acids by photometric means. A Seher(Deut. Inst. Fettforsch., Münster/Westf., Ger.). *Fette, Seifen, Anstrichmittel* **58**, 498–504(1956). Fatty acids are eluted from paper impregnated with undecane by using acetic acid as the mobile phase. The acids are in the form of copper soaps and are determined photometrically or polarographically after removal. The interpretation of the photometric curves of overlapping components is discussed in detail. (*C.A.* **52**, 4212)

Paper chromatography in the fat field. XIX. Quantitative paper chromatographic determination of the straight chain fatty acids and their mixtures. H. P. Kaufmann(Univ. Münster/Westf., Ger.). *Fette, Seifen, Anstrichmittel* **58**, 492–8(1956). The various methods of developing the individual homologs of fatty-acid mixtures after paper chromatographic separation are discussed, showing how the procedures can be made quantitative. The development of metal soaps by using radioisotopes, the production of colors with dyes, color reactions with the unsaturated acids and photometric techniques are discussed. For the determination of unsaturated acids methods based on Co^{60} soaps, iodine nuber with I^{131}, photometric absorption in the ultraviolet, polarographic determination of copper from the developed copper soaps, and mercury from the mercuric acetate addition complex are used. Comparative results obtained from the analyses of mixtures of saturated and unsaturated fatty acids by the various procedures are given. (*C.A.* **52**, 4211)

The influence of the purification of cottonseed oil upon its hydrogenation rate. I. I. Voloshin and D. V. Sokol'skii. *Izvest. Akad. Nauk Kazakh. S. S. R., Ser. Khim.* **1957**(1), 67–75. The purified and unpurified cottonseed oils were hydrogenated on a nickel skeleton catalyst. By leaving the various impurities in the oil or removing them selectively, it was found that the lipochromes do not poison the catalyst. The free fatty acids are not exactly poisons, yet their presence is undesirable as they make the removal of the true catalyst poisons difficult, and they attack the catalyst by virtue of their acid properties. An excess of alkali used to refine the oil prior to hydrogenation does no damage, and a further treatment of the oil with active clay at low temperatures will have a beneficial effect. After clay treatment at high temperatures, no extra treatment for the removal of proteins is necessary. (*C.A.* **52**, 4213)

Refining of rapesed oil from seed of low quality. K. Danowski, H. Niewiadomski, and K. Rokosz. *Prace Inst. i Lab. Badawczych Przemystu Rolnego i Spożywczego* **7**(2), 26–38(1957). Rapeseed oil from seed attacked by mold and bacteria is dark, has an offensive odor, and contains nitrogen and sulfur compounds. Conventional refining with sodium hydroxide removes sulfur and most of the color, but the oil still contains nitrogen compounds, and the odor remains. Acid refining with sulfuric acid (specific gravity 1.82, 1% of oil weight) at 20° removes most of the odor and nitrogen, but the oil is still dark and has a high acid number. When the acid refining is followed by treatment with sodium hydroxide, a light-colored odorless oil, almost free from nitrogen and sulfur, is obtained; acid number 0.2–0.3. (*C.A.* **52**, 4213)

Refining castor oil. I. Uruska, E. Mossakowska, and H. Neiwiadomske. *Prace Inst. i Lab. Badawczych Przemystu Rolnego i Spożywczego* **7**(2), 38–57(1957). The influence of process variables on the yield and quality of refined castor oil was studied. Crude oils with low acid number give the best refining yields and a low soap content in refined oil. Oils pretreated by washing with hot 8% sodium chloride solution followed by steam stripping for fifteen minutes, do not emulsify readily, and also give higher refining yields. Refining at 60–70° with 6–8% sodium hydroxide solution in presence of a layer of 1.5% sodium chloride solution gives the best results. Lower alkali concentrations and refining with sodium carbonate cause emulsification; alkali concentrations above 12% give sticky soaps with poor separation from the oil. Agitation must be slow, in order to avoid formation of stable emulsions. Because of the solubility of ricinoleic soap in the oil, its removal from the oil, even by repeated washing with water and sodium chloride solution, is incomplete. In a pilot run, a 94.5% refining yield was obtained; crude acid number 9.6; refined acid number 1.03; soap content 0.028 (as % sodium hydroxide). In a production run, resulting in 88% refining yield, the corresponding values were 11.8, 2.1, 0.01. Treatment of refined oil with 3% bleaching earth reduces the soap content to 0.001, but the acid number is increased (in one example from 1.3–2.5). Color removal was 35–45%. (*C.A.* **52**, 4213)

Oil extracted from titoki berries (Alcetyron excelsum). S. G. Brooker(Abels Ltd., Auckland). *Trans. Roy. Soc. New Zealand* **84**, 935(1957). Extraction with petroleum ether gave a 30% yield of oil which had the following values: n_D^{20} 1.4697, free fatty acids (as oleic) 2.4%, iodine value 71.5, saponification value 221.0. (*C.A.* **52**, 4214)

Discoloration of fish oil. XI. J. Nonaka(Tokyo Coll. Fisheries). *Nippon Suisangaku Kaishi* **21**, 1244–7(1955–56). It was suggested previously that the oxidized acids are an essential factor in discoloration of fish oil and that they are derived from acidic carbonyl compounds produced during autoxidation. Discoloration and solubility properties of pure carbonyl compounds were studied under the conditions allowing formation of oxidized acids. Higher aldehydo-acids and diacetyl and crotonaldehyde seemed likely to be the precursors of the oxidized acids formed in discoloration of fish oil. (*C.A.* **52**, 4214)

XII. *Ibid.* 1248–9. With the purpose of detection of half aldehydes in discolored fish oils, paper chromatography of 2,4-dinitrophenylhydrazones of pure acidic aldehydes was studied. (*C.A.* **52**, 4214)

XIII. *Ibid.* 1250–2. It was concluded that the discoloration of fish oil is due to half aldehydes that are formed during autoxidation and that they react with ammonia and other amines to produce pigments. (*C.A.* **52**, 4214)

Makes better butter. G. H. Wilster(Oregon State College, Corvallis, Oregon). *Food Engineering* **30**(2), 92(1958). Special temperature treatments that are applied to the cream after it is pasteurized and before churning will produce a butter of superior consistency and which can be spread smoothly on bread shortly after it is removed from the refrigerator.

Flour lipides; effect of chlorine dioxide treatment of flour on the essential fatty acids. N. Fisher, Mrs. M. L. Ritchie, J. Williams, and J. B. M. Coppock(Baking Inds. Research Sta., Chorleywood, Engl.). *Chem. & Ind.* **1957**, 1179–80. Linoleic, linolenic, and arachidonic acids content of untreated flour and flour treated with chlorine dioxide were determined. Even at the high-level chlorine dioxide treatment (ten times the commercial level) there was only a 5.4% drop in the apparent linoleic acid content, or 11% of the original value, which may be due to the polymerization induced by chlorine dioxide. The differences observed in the levels of linolenic and arachidonic acids, before and after treatment, are not significant. (*C.A.* **52**, 4046)

Oxidation of milk phosphatides. J. Koops and J. W. Pette (Inst. Dairy Research, Ede, Neth.). *Intern. Dairy Congr., 14th, Rome*, **1956**(2), Pt. 1, 168–79. The phosphatides are more easily oxidized than the glycerides of butterfat. It is very probable that the oxidation starts at the fat-water interface. The oxidation of phosphatides is accelerated by calcium, by lower pH, and by sodium chloride. It is probable that the

copper ions in the system accelerate oxidation. If phosphatides are oxidized in the presence of copper, substances are formed which, when brought into contact with butterfat, give it a tallowy flavor. (*C.A.* 52, 4048)

Properties of Canadian milk fat. Specific gravity. R. R. Riel (Can. Dept. Agr., Ottawa). *Intern. Dairy Congr. 14th, Rome,* **1956**(2), Pt. 1, 364–70. Monthly samples from twenty-nine factories were used to establish the normal range. The average specific gravity 40°/25° of 327 samples was 0.9072, with 95% fiducial limits of 0.9060 and O.9084. Summer milk fat had a higher specific gravity than did winter. Low but significant correlation was found between specific gravity and each of the following properties: Reichert-Meissl, Polenské values and index of refraction. (*C.A.* 52, 4052)

The composition of New Zealand butterfat. F. B. Shorland and R. P. Hansen (Dept. Sci. Ind. Research, Wellington, N. Z.). *Intern. Dairy Congr., 14th, Rome,* **1956**(2), Pt. 1, 613–22. In addition to the straight-chain fatty acid, butterfat contains branched-chain fatty acids, including C_{13}, C_{15}, and C_{17}; *iso* and *anteiso* acids have been found equivalent to approximately 2% of fatty acid. Normal odd-number fatty acid, including C_{11}, C_{13}, and C_{15} have been isolated in similar proportions. The vitamin A concentration exhibits seasonal variations with the highest 45–50.2 I.U. per gram in late winter and 18.3–33.4 in summer. Factors affecting composition are discussed, including the central role of acetate. These concepts explain seasonal variation and unusual fatty acids. (*C.A.* 52, 4052)

Some of the principal factors influencing the keeping quality of butter during cold storage. P. E. E. Piraud, P. Jamotte, F. Lheureux, and R. Lacrosse (Sta., laitière état, Gembloux, Belg.). *Intern. Dairy Congr., 14th, Rome* **1956**(2), Pt. 1, 341–8. The factors which influence keeping quality are copper concentration, raw materials, pasteurization of the cream, pH, and composition of the fat. Of the butters with copper content below fifty milligrams per kilogram, 75% lost score after 6 months' storage. Insufficient heat treatment, as indicated by the sulfhydryl content, was the cause of a high percentage of the failures. Butters with a pH from 4.8 to 5.0 keep longer than those with a pH of 4.5 or less. A high concentration of polyunsaturated fatty acids (particularly C_{18} conjugated dienoic acids and linolenic acid) explain the difficulties in keeping butters manufactured in August and September. (*C.A.* 52, 4052)

The technique of manufacturing and storing butter in retail packages. E. Rahmn (Swed. Dairies Assoc., Stockholm). *Intern. Dairy Congr., 14th, Rome,* **1956**(2), Pt. 1, 352–7. Butter should be worked to complete dryness to avoid bacteriological defects. The pH should be between 6.4 and 7.1 and sodium chloride between 1.5 and 1.7% for the best keeping quality in cold storage. (*C.A.* 52, 4052)

Influence of reduced air pressure during the working of butter. P. Swartling, T. Olsson, and A. B. Buhrgard (State Dairy Research Sta., Alnarp, Swed.). *Intern. Dairy Congr., 14th, Rome,* **1956**(2), Pt. 1, 473–80. Working butter under reduced pressure does not affect the flavor or the diacetyl content. The improvement in keeping quality is slight. If the air pressure is too low, droplets of butter oil appear on the surface. (*C.A.* 52, 4053)

Detection of refined lard. H. P. Kaufmann, J. G. Thieme and F. Volbert (Deut. Inst. Fettforsch., Münster/Westf., Ger.). *Fette, Seifen, Anstrichmittel* **58**, 505–7(1956). The ratio of the extinction coefficients observed at 232 and 268 millimicrons can be used to determine whether or not a lard has been refined. (*C.A.* 52, 4054)

Oxidation changes of pork lard during its processing. M. Sh. Kofman and V. M. Levitskaya. *Sbornik Stud. Rabot Moskov. Tekhnol. Inst. Myasnoĭ i Molochnoĭ Prom.* **1955**(3), 72–4. The oxidizing changes occurring during the rendering of lard in horizontal kettles and in the centrifugal machines of Anufriev, Vechkanov, and Zemlyannikov are studied. The character of oxidizing changes is the same for all methods of processing. The degree and intensity of oxidation at different steps of each process are cited. (*C.A.* 52, 4054)

Refining and the nutritive value of edible oils. M. Th. Francois. *Symposium matèires etrangers aliments, 2e, Amsterdam* **1956**, 70–87. This descriptive review covers methods of refining, vitamin contents, analyses, fractionation, metabolism, lecithins, bleaching, deodorizing, and neutralization of oils. 50 references. (*C.A.* 52, 4054)

Making visible unsaturated lipides on paper and in histological sections. J. Barrollier (Schering A.-G. Berlin). *Naturwissenschaften* 44, 428(1957). By the usual method of coloring the lipides with Sudan dyes no differentiation can be made between the saturated and unsaturated lipides. Differentiation can be accomplished by adding a halogen, converting this to the silver halide, and reducing to silver. (*C.A.* 52, 3895)

Conjugated oils. M. Fauve. *Peintures, pigments, vernis* **33**, 804–13(1957). A review, comparing physical properties of various conjugated oils. Included are both natural oils and those obtained by chemical treatment such as thermal isomerization. (*C.A.* 52, 2423)

The addition of thiocyanogen to unsaturated fats. I. Catalytic influence of $HgCl_2$. S. K. Chakrabarty, D. Ganguly, and M. N. Goswami (Univ. Coll. Sci. Technol., Calcutta). *J. Indian Chem. Soc., Ind. & News Ed.* 20, 6–10(1957). A catalyst, such as mercuric chloride, accelerates the speed of addition of thiocyanogen to the double bonds of unsaturated oils and at the same time retards polymerization of the reagent. The thiocyanogen number calculated from a mercuric chloride-catalyzed reaction run for five hours corresponds to the twenty-four-hour normal thiocyanogen number of an uncatalyzed reaction. (*C.A.* 52, 2427)

Reclamation of rancid fats. J. G. Saha, P. Roy and M. M. Chakrabarty (Univ. Calcutta). *J. Indian Chem. Soc., Ind. & News Ed.* 20, 25–8(1957). Adsorbents, such as activated bentonite, Fulmont earth, 511 carbon, activated carbon, and silica gel, reduced the peroxide value of rancid fats. Among the above adsorbents, activated bentonite was the most effective. (*C.A.* 52, 2427)

The component fatty acids of Argemone mexicana seed oil (Indian). S. R. Chakrabarty and M. M. Chakrabarty (Univ. Calcutta). *J. Indian Chem. Soc., Ind. & News Ed.* 20, 33–7 (1957). The fatty acids separated from the seed fat of *Argemone mexicana* were found to contain: linoleic acid 62.2, oleic acid 17.2, saturated acids 19.6, and nonsaponifiables 1%. (*C. A.* 52, 2427)

Fractionation determination of fatty acids. A critical review and suggestion of a new method. S. Pontremoli (Univ. Genoa) and G. Ivaldi. *Quaderni sez. perugina soc. ital. biol. sper.* **No. 15**, 5–74(1954). After a review (153 references), a method is presented. (*C.A.* 52, 2428)

Methods for reclaiming oil from decolorizing earths. K. Liapis and X. Thomopoulos. *Chim. Chronika* 22, 153–8(1957). Tests on recovery of oil adsorbed on bleaching earths which were used on cottonseed oil has indicated that solvent extraction gives the best results. (*C.A.* 52, 2428)

Composition of Indian tobacco-seed oils. S. R. Chakrabarty and M. M. Chakrabarty (Univ. Coll. Sci. Technol., Calcutta). *J. Indian Chem. Soc., Ind. & News Ed.* 20, 17–22(1957). The variations in the composition of tobacco-seed oils of Indian origin have been found to be of a minor nature, and the polyethenoid acid content was always above the critical value for classification as drying oils. (*C.A.* 52, 2428)

Vitaminization of fats. V. A. Devyatnin. *Vsesoyuz. Nauch-Issledovatel. Vitamin. Inst., Vitaminizatsiya Pishchevykh Produktov* **1955**, 39–43. A discussion of the results of investigations of supplementing vegetable oils, margarine, and cooking fat with vitamin A and D is given. The maximum level of vitamin A added to refined sunflower oil which could be used without noticeable organoleptic changes was 250-2500 I. U. per gram. No change was observed in vitamin A, acidity, or appraisal of vitaminized product after a month's storage at 9–10°. The stability of vitamin A was due to the high concentration of linoleic acid glycerides and tocopherol in the sunflower oil. Margarine, prepared from sunflower oil, supplemented with 50,000 I. U. of vitamin A and 5000 I. U. of vitamin D per kilogram of product showed good storage retention of vitamin A. Vitamins A and D, added to cooking fat, were completely retained during preparation of the fat and after one month's storage at 6° Cooking fat heated for thirty minutes lost 14–15% of vitamin A. This relatively small loss and the stability of vitamin A was ascribed to the vitamin E (60 milligrams %) and lecithin contents of the fat. The vitamin E concentration was unchanged by the heating process. (*C.A.* 52, 4055)

The behavior of butterfat during melting. J. Hannewijk and A. J. Haighton (Unilever Research, Vlaardingen). *Neth. Milk Dairy J.* 11, 304–12(1957). Dilatometric investigation of butterfat yielded the following coefficients of expansion in cubic millimeter per gram per degree. Liquid fat at 0° 0.84, at different temperatures $0.84 + 0.00056T$, solid fat slowly cooled 0.45, rapidly cooled 0.57. Values for solid fat differed from those of Mulder and Klomp found from experiments with cream. The expansions from solid to liquid butterfat at 0° in cubic millimeter per gram were for slowly cooled winter fat and summer fat 67.6 and 64.8, respectively; for rapidly cooled

winter fat and summer fat 57.6 and 56.3, respectively. At temperatures differing from 0°, a factor 0.40T for slowly or rapidly cooled fat has to be added. Percentages of solid phase at various temperatures are given for summer and winter fat cooled slowly and rapidly. Fat was considered preferable to cream for dilatometry, in agreement with Adriani and Tamsma. (*C.A.* **52**, 4879)

Viscosity of some oil mixtures. B. P. Gyani and M. Murari (Sci. Coll., Patna). *J. Indian Chem. Soc., Ind. & News Ed.* **19**, 153–4(1956). The viscosities of pure argemone oil and the oil from *Caesalpinia digyna* were measured at different temperatures. These data show that the heats of activation of viscous flow of argemone oil and *Caesalpinia digyna* oil are 8291 and 8321 calories per average mole, respectively. Viscosities at 40° of argemone oil, hydrogenated peanut oil, kerosine, diesel oil, and benzene mixed with acetylated castor oil indicated that there is a simple relation between viscosity and composition of the mixture. The coefficient of viscosity was about half although acetylation increases the molecular weight of the castor oil. Viscosities of the following mixtures were also determined: argemone oil-castor oil, hydrogenated peanut oil-castor oil, and liquid paraffin-kerosine. (*C.A.* **52**, 2429)

Gas chromatography and mass spectrometry. W. H. Stahl(Quartermaster Food and Container Inst.). *Surveys Progr. Military Subsistence Problems*, Ser. 1(9), 58–75(1957). The use of gas-liquid partition chromatography together with mass spectrometry as an isolative system for the identification of odor components is described. (*C.A.* **52**, 2290)

Conjugated fatty acids. II. The thermal polymerization of the conjugated fish oil obtained by the nickel-on-carbon catalyst isomerization. Y. Tsuchiya and M. Kayama(Tohoku Univ., Sendai). *Tohoku J. Agr. Research* **7**, 277-89(1957). Fish (cod-liver and saury) oils were conjugated by heating for three hours at 170–80° with nickel-on-carbon catalyst. Nuchar-type carbon was the best of the activated carbons tested; the catalyst was activated by heating in hydrogen for one hour at 350–70°. Maximum conjugation was less than half that obtained by alkali isomerization. The conjugated fish oils were polymerized in evacuated ampuls or under nitrogen at 270° The mechanism of the conjugation step is discussed. (*C. A.* **52**, 2428)

Determination of lipides in animal organs with the help of a special homogenizer. M. Wenke, J. Wenkeova and A. Sip. *Physiol. Bohemosloven.* **6**, 251–3(1957). The rapid determination of the lipide content in animal organs (spleen, kidney, and liver), carried out by using the findings of Stern and Shapiro is described in detail. (*C.A.* **62**, 2139)

Using statistical procedures in industrial manufacturing proceesses. W. Vollmer. *Fette, Seifen, Anstrichmittel* **58**, 928–32 (1956). A review of statistical procedures in industrial quality control. (*C.A.* **52**, 5001)

What's a good antioxidant? G. De Navarre. *Am. Perfumer Aromat.* **71**(1), 27(1958). Thiodipropionates, butylated hydroxyanisole, and butylated hydroxytoluene are among the best antioxidants for fats: they discolor very little. (*C.A.* **52**, 5001)

Modern technology of fats and fat products. XXX. Drying of raw materials. H. P. Kaufmann and J. G. Thieme(Deut. Inst. Fettforsch., Münster/Westf., Ger.). *Fette, Seifen, Anstrichmittel* **58**, 921–8(1956). A review of the theory and practice of drying of raw materials. (*C.A.* **52**, 5001)

Hydrolysis of fat in the Twitchell process. K. Fukuzumi and M. Mizuta(Nagoya Univ.). *Kôgyô Kagaku Zasshi* **59**, 610–12(1956). Coconut oil is hydrolyzed with dibutylnaphthalene sulfonic acid in the presence of sulfuric acid. The rate constants of reactions: (a) triglyceride to diglyceride, (b) diglyceride to monoglyceride, and (c) monoglyceride to glycerol are determined. The reaction constants deviate from the apparent first-order reaction constants in the following decreasing order: b, a, and c. The same is true in the presence of sulfuric acid, but rates are about 3, 4, and 5 times that of reaction without acid for a, b, and c, respectively. (*C.A.* **52**, 5001)

Oxidation of components of soluble oils. L. F. Ellis, R. Samuel-Maharajah, Laura May Mendelow, L. Ruth and H. Pivnick (Univ. of Nebraska, Lincoln). *Appl. Microbiol.* **5**, 345–8(1957). Microbial oxidation of the following soluble oils was examined: sulfonated castor oil, sulfurized lard oil, sperm oil 45° NW, prime lard oil, tall oil, sulfurized sperm oil, pale oil, rape seed oil, petroleum sodium sulfonate, naphthenic acids of acid number 100, sodium oleate, triethanolamine oleate, sodium soap of wood rosin, polyoxyethylated nonylphenol, fatty alkylol amine condensate, sorbitan monolaurate polyoxyethylene derivative, fatty ester of high poly alcohols, ethylene glycol monoethyl ether, ethylene glycol monomethyl ether, ethylene glycol monobutyl ether. The culture included *Pseudomonas oleovorans, Pseudomonas formicans,* and mixed cultures. The polyoxyethylated nonylphenols appeared resistant to oxidation; the ethylene glycol monoethers and the methyl and ethyl ethers were readily oxidized; and the butyl ether was resistant. (*C.A.* **52**, 5003)

Determination of neutral fat in oils with high acidity. F. Minutilli(Univ. Rome). *Rass. chim. per chim. e ind.* **9**(3), 15–16 (1957). The method used is based on the greater adsorptive power of neutral aluminum oxide for the more polar constituents of an oil than for the less polar ones. Olive oil samples, (1.3–1.7 gram) of 20–80% acidities (oleic acid was added), in 25 milliliters ether are passed through a 2.5 centimeters diameter column containing 40 grams aluminum oxide followed by 75 milliliters ether. The neutral oil is recovered from the filtrate. Losses in neutral substances are 0.60–0.73%. (*C.A.* **52**, 5003)

Determination of erucic acid in rapeseed oil. T. A. Seşbeş. *Rev. fac. sci. univ. Istanbul,* Ser. C22, 214–24(1957). The rapeseed oil had: specific gravity 15°, 0.9169; acid number, 7.3; saponification number, 190; iodine number, 102; acetyl number, 7.3; solid fatty acid content, 66.6%. Precipitation of potassium soaps from acetone overnight at 25°, recrystallization of the acids from ether, and drying in carbon dioxide atmosphere was used to separate liquid and solid acids. A technique based on magnesium soap separation was unsatisfactory. Erucic acid was then isolated by bromination, fractionally distilling the brominated acid, and recovery by debromination. The sample contained 61.25% erucic acid. (*C.A.* **52**, 5004)

Investigation of cottonseed oil from seeds planted in Azerbaidzhan and study of methods of refining it with domestic clays. A. M. Guliev and A. S. Mamedov. *Uchenye Zapiski, Azerbaĭdzhan. Gosudarst. Univ. im S. M. Kirova* **2**, 19–25(1955). Raw cottonseed oil from Azerbaĭdzhan obtained by pressing contains: phosphorus 0.033, nitrogen 0.043, unsaponifiable matter 2.5–3.0, gossypol 0.54–1.0, phospholipides 0.8–1.0%. Optimal conditions for alkali refining are: concentration of alkali 8–12%, temperature 40–50°, time of processing 60–70 minutes. Adsorption efficiency of clays of Azerbaĭdzhan, "Khanlar," "Tauz," and "Shankhor," respectively, descends in the order listed. (*C.A.* **52**, 5004)

Oil from Catalpa bignonioides. A. L. Markman and M. D. Bodnya(Central Asia Polytech. Inst., Tashkent). *Zhur. Obshcheĭ Khim.* **27**, 2293–7(1957). The oil extracted from seed of the plant with gasoline had the following constants: density 0.942–0.944, index of refraction 1.5001–1.5021, acid number 1.24, saponification number 191.5, iodine number 171, acetyl number 33.2, diene number 27. The oil approaches tung oil in its characteristics, but has a thiocyanate number of but 96.7. Chemical and spectroscopic examination showed the following acid content: saturated acids 4.39%, oleic acid 10.08%, linoleic acid 38.81%, linolenic acid 15.77%, conjugated diene acids 4.5%; eleostearic acid 30.95%. (*C.A.* **52**, 5004)

Analysis of the seed oils of Digitalis ferruginea. R. Tulus and S. Imre. *Rev. fac. sci. univ. Istanbul,* Ser. C22, 199–207(1957). The yellow-brown oils extracted with petroleum ether from seed of *Digitalis ferruginea* grown in Istanbul in 1956 had: specific gravity d_{20}^{20}, 0.0207; n^{70}, 1.4538; acid number, 2.31; saponification number, 190; ester number, 187.7; iodine number, 120.8; unsaponifiable portion, 0.68%. The oils contained 2.5% phenol compounds. These gave a 51.2% yield of stearin-digitonin additional product. After the removal of the free fatty acids and the phenol compounds by saponification and extraction, fatty acids were obtained in 39.1% yield, which on separation gave 19.3% solid and 80.4% liquid fatty acids. Analysis confirmed the presence of palmitic, stearic, oleic and linoleic acids. It was proved that linolenic acid is absent. (*C.A.* **52**, 5003)

Hydrates of the calcium salts of some fatty acids. V. I. Solnyshkin(Mining Inst., Acad. Sci. U. S. S. R., Moscow). *Kolloid. Zhur.* **19**, 736–40(1957). Dry calcium stearate took up 1.8 moles water from xylene containing water and 3.8 moles water from water vapor; from the heat of wetting by water (8.4 calories per gram) the hydration number was 3.6. Calcium oleate, calcium ricinoleate and sodium stearate had heat of wetting by water 13.8–13.9, 17.9 and 4.3 calories per gram; and hydration numbers were 5.8, 7.9, and 0.92, respectively. (*C.A.* **52**, 5003)

Peroxide values in lard. B. Malčić. *Vet. arhiv* **27**, 307–14 (1957). Lards of varying degrees of freshness were tested for peroxide values. A modified Wheeler method was found to be simpler and speedier than that of Lea. (*C.A.* **52**, 4881)

Storage of cottonseeds in gunny bags. A. Saleem and A. Hussain(Agr. Coll., Lyallpur), *Agr. Pakistan* **7**, 327–31(1956). The free fatty acid content of L.S.S., 4F, and 489F varieties of cottonseeds rose 0.79–1.8, 1.0–4.7, and 0.92–2.7%, respectively, the moisture content being 7.2–8.3, 6.3–8.0, and 5.5–7.6%, respectively, during 9 months' storage in gunny bags. The contents of oil, protein, and sugars remained unchanged. (*C.A.* **52**, 5003)

Hardness of butter. I. Influence of season and manufacturing method. J. M. Deman and F. W. Wood(Dept. of Dairying, Univ. of Alberta, Edmonton, Canada). *J. Dairy Sci.* **41**, 360–368(1958). Hardness was measured on weekly samples of conventionally churned and continuously made butter taken over a period of 1 year. Penetrometer and sectility methods were used at 17 and 12°, respectively. The continuously made butters were consistently harder than the conventionally churned butters. Similar seasonal variations were found for both butters and were greater than differences between the two butter types at 17°. Hardness maxima occurred simultaneously with softening-point minima, as determined previously. Hardness of conventional butter was less influenced by the experimental temperature difference than was that of the continuous type butter. The hardness of the continuous type butter decreased as gas was added and, therefore, gas content may be a partial cause of the hardness differences. A major portion of the setting of the continuous butter occurred during the first 3 hours after manufacture and was attributed to crystallization, which was still in progress. The hardening taking place after this first period was attributed to thixotropic changes.

Oiling-off properties of butter. J. M. Deman and F. W. Wood (Dept. of Dairying, Univ. of Alberta, Edmonton, Canada). *J. Dairy Sci.* **41**, 369–374(1958). In this study, the oiling-off properties of conventionally churned and continuously made butter have been determined. Butter made by the continuous process had a consistently greater tendency to oil-off at 25 or 28° than did conventional butter. Seasonal variations throughout a 12-month period followed the same trend for both butter types, and were considerably greater within the type than the differences between corresponding samples of the two types. Maximum and minimum oiling-off occurred in June and October-November, respectively. This corresponds with the dates of minimum and maximum hardness of the butters of this region. The gas content did not influence oiling-off of the continuous butter, but gas content may contribute to stickiness. Oiling-off, when expressed quantitatively as weight-percentage of the original test sample, was found to be a function of the height of the test block of butter. Temperature, as well as grade and size of filter paper, also influenced the results.

A comparison of detergent tests for butterfat in milk with official methods. S. R. Hoover and T. J. Mucha(Dairy Products Section, Eastern Utilization Research and Development Division, Ag. Research Service, U.S.D.A., Washington, D. C.) and W. R. Harvey. *J. Dairy Sci.* **41**, 398–408(1958). A collaborative comparison of the Schain and Dairy Products Section tests with the official methods, the Babcock and Mojonnier tests, was performed by a group of experienced research workers. The volumetric tests were performed in duplicate by eight men; the Mojonnier test in quadruplicate by one man. Twelve cows comprising four breeds with three cows of each breed were used. Morning and evening milk were analyzed one day of the first, third, and fifth week. The butterfat content of the milk from these individual cows varied considerably over the 5-week period. Differences of 1% fat were found in five out of the 12 cows, using the average of the morning and evening samples. This variation is far greater than that attributable to the analytical procedures or to the individual testers.

Composition of sugar-cane wax. V. V. Mhaskar and A. B. Kulkarni(Natl. Chem. Lab., Poona). *J. Sci. Ind. Research* **16B**, 374–5(1957). The crude wax contained 35.5% mixed fatty acids and 60% unsaponifiable matter. Chromatographic separation of the methyl esters of the fatty acids on aluminum oxide indicated 21.3 hydroxy, and 54.7% normal fatty acid esters. The latter contain oleic, 5.2; linoleic, 2.0; saturated fatty acids from C_{14} to C_{24} (largely C_{18}), 24.5%; fatty acids from C_{30} to C_{36} 68.2%. Very small amounts of C_{20} and C_{22} acids were found. Fractionation of the mixture of hydroxy acids gave an acid, melting point 95–6°, average molecular weight 462, acetate melting point 75–6°. The unsapoinifiable matter contained 2.7% hydrocarbons, 32.1% normal fatty alcohols, the major part of which was myricyl alcohol, and 17.1% sterols from which stigmasterol and sitosterol were isolated. (*C. A.* **52**, 4215)

Waxes for impregnation. M. Celerynová(Vyzkumny ústav obalove tech. Prague). *Papír a celulosa* **11**, 272–5(1956). Different waxes, their origin, properties, and mixtures are discussed with regard to impregnative purposes. The use of waxed and wax-impregnated papers for wrapping are reviewed. (18 references) (*C. A.* **52**, 2429)

Solution of the montanic acid problem by chromatography and infrared spectroscopy. W. Fuchs and R. Dieberg(Tech. Hochschule, Aachen, Ger.). *Fette, Seifen, Anstrichmittel* **58**, 826–31 (1956). Methyl octacosanate is prepared to serve in proving identity of an acid isolated from montana wax. Technical montanic acid contains octacosanoic acid as the main component and is accompanied by even-numbered carbon homologs. (*C. A.*

New lanolin fraction for wax dispersions. D. Schoenholz and G. D. Burns(Foster D. Snell, Inc., New York, N. Y.). *Soap Chem Specialties* **34**(1), 92–3, 95, 103(1958). Tests on blends with vegetable (carnauba), oxidized microcrystalline, polyethylene, and oxidized Fischer-Tropsch waxes indicated that "Lanfrax" a hard, waxy material separated from lanolin by a solvent crystallization process and rich in sterols, can be used to partially replace amine soap emulsifiers commonly used to disperse waxes in floor polish. (*C. A.* **52**, 5004)

Export outlook for oilseeds and their products. G. A. Parks (Fats & Oils Div., Foreign Agricultural Service). *Soybean Digest* **18**(6), 14–15(1958). World production of fats and oils during 1958 is discussed primarily in terms of soybean, cottonseed and peanut oils. Exports of oilseed and edible oils from the United States are expected to remain high.

Method of preparing bakery products. E. F. Glabe(Food Technology, Inc.). *U. S. 2,827,378.* In making bakery products from fermented doughs, a hydroxylated phosphate is added.

Stabilization of materials. H. Schlenk, D. M. Sand and Jerry Ann Tillotson(Univ. of Minnesota). *U. S. 2,827,452.* An unstable organic substance is stabilized by the formation of an inclusion compound with a complex-forming carbohydrate such as a starch or dextrin.

Eliminating rancidity of glyceridic oils. L. Lang and R. J. Baird(The National Sugar Refining Co.). *U. S. 2,827,472.* A rancid oil is treated with a rancidity-removing agent such as an alkali or alkaline earth sucrate, starchate and cellulosate.

Color stabilization of fatty materials. P. Gibson(Swift & Co.). *U. S. 2,828,320.* Color reversion of decolorized fats is inhibited by the addition of no less than 0.01% of hypophosphorous acid and no less than 0.01% of an antioxidant such as di-*tert.*-butyl-*p*-cresol, butylated hydroxyanisole, *beta*-naphthol, propyl gallate, and hydroquinone.

Method of treating rice. A. K. Ozai-Durrani. *U. S. 2,829,055.* Removal of the bran coating from dehulled rice is facilitated by extracting most of the oil from the coating with a low boiling hydrocarbon solvent.

Presses for the extraction of oils and fats. A. J. Powell. *U. S. 2,830,530.* The press is described.

Yeast plasticizer. J. E. Farbak and E. J. Kasmen(Swift & Co.). *U. S. 2,830,906.* A mixture is prepared containing at least 55% by weight of an edible vegetable oil and minor amounts of oleic acid partial glycerides, an alkali metal salt of a sulfated triglyceride and a fatty acid mono-ester of a polyhydric alcohol such as sorbitan or polyoxyethylene glycol.

Recovery of wool wax. L. F. Evans, W. E. Ewers and C. Simpson(Commonwealth Scientific and Industrial Research Organisation). *Australian 160,602.* A subaeration flotation apparatus is described for recovery of wool wax (lanolin) in the form of a froth from wool-scour liquors. (*C. A.* **52**, 4217)

Emulsifying agent. J. Groot and H. Groot. *Belg. 507,494.* The emulsifying agent is obtained by the condensation of polyoxyethylenes with polymerized oils and(or) oxidized drying or semidrying oils, such as linseed oil, soybean oil, sunflower oil, corn oil, cotton oil, or their mixtures. The condensation, which gives uncolored products can be replaced by etherification using polyalkylene glycols, such as polyethylene glycol, polypropylene glycol, and polybutylene glycol. By using higher oxyethylene glycols, more water-soluble emulsifying agents are obtained. (*C. A.* **52**, 5009)

Glyceride molecular rearrangement. (Thomas Hedley & Co., Ltd.). *Brit. 785,147.* Interesterification, resulting in an increase of the cloud point of glycerides, such as lard and cottonseed oil, is more effective and rapid, hence applicable to continuous processes, when liquid potassium/sodium alloys instead of the pure metails or their dispersions are used as catalyst. When 5.4 parts potassium/sodium 1:1 and 2000 parts lard were mixed in a Premier mill at 97°F. for 5 minutes, the cloud point increased from 17.4° to 22.6°, and to 29.4° after treating one hour. Similarly the cloud point of cottonseed oil increased from 18.6° to 29.5°. The catalyst

dispersed in the oil should have an average droplet diameter not exceeding 50 microns. (*C. A.* **52**, 4216)

Ricinene oil. J. Scheiber. *Ger. 832,751.* Castor oil is introduced into a sufficient quantity (at least one-third equivalent) of free fatty or resin acids with such a velocity that the free hydroxyl groups are esterified immediately and the resulting esters are partially cleaved. The cleavage is completed at 250–80° or more and preferably at 30–50 millimeters pressure. The products are obtained in quantitative yield. (*C. A.* **52**, 4217)

Esters from carboxylic acids extracted from cork. G. Dupont and A. Guillemonat(Centre national de la recherche scientifique). *Ger. 926,908.* Esters of mixed carboxylic acids extracted from cork are prepared by heating the mixture with an alcohol in the presence of strong acid. The mixture of ethyl esters thus prepared was a semisolid resembling butter. (*C. A.* **52**, 2430)

Triglyceride of 9,11-linoleic acid. F. Schlenker(Chemische Werke Alvert). *Ger. 927,629.* The glyceride is prepared by dehydration of castor oil with a mixture of sodium acid sulfate and boric acid or other boron compounds as catalyst. The glyceride thus prepared has a higher iodine number, a better color and is formed more rapidly than glyceride prepared with other catalysts; it has excellent drying properties. (*C. A.* **52**, 2424)

Separation of synthetic fatty acids with urea. A. Marzin. *Ger. (East) 9205.* The mixture of fatty acids, obtained by the oxidation of paraffins, is treated with a solvent, e.g. hot methyl alcohol. After crystallization of the most part of the straight-chain acids at −10°, the filtered solution is treated with urea in one or several steps. The residual solution contains the branched-chain acids, which forms soluble salts with earth alkalies, i.e. soaps resistant against lime. (*C. A.* **52**, 5007)

Separation of fish oil from marine products. S. Tada and T. Nakamura. *Japan. 327('57).* Raw materials containing saccharides, e.g. molasses or starch lees, and water, if necessary, are added to fish entrails. The mixture is fermented directly or after addition of one or more strongly fermenting substances, e.g. yeast, lactic acid bacteria, or *Bacillus subtilis.* For example, 100 kilograms of trout guts was mixed with 8 kilograms of molasses and the pH adjusted to 5.2 by hydrochloric acid. After three hours, the mixture was liquefied and the surface was covered with an oil layer, 14.52 kilograms clear, slightly yellow fish oil being obtained. (*C. A.* **52**, 4217)

Refining of fish oils and fish-liver oils. N. Yoneda(Hayashikane Marine Industries Co.). *Japan. 1836('57).* Whale oil (one kilogram) with a bad odor and an acid number five is treated with fifty grams of glacial acetic acid, stirred for three hours at 80°, and let stand for one day. The acetic acid is removed *in vacuo* and the residue is neutralized with sodium hydroxide, washed with warm water, and dried, giving 950 grams refined oil free from fishy odor. Treatment with formic acid gave the same results. (*C. A.* **52**, 4217)

Refining of fish oils and fish-liver oils. N. Yoneda(Hayashikane Marine Industries Co.). *Japan. 1837('57).* Cod-liver oil (one kilogram) of red-yellow color with bad odor and containing 10,000 units of vitamin A per gram is treated with one hundred grams of fifty per cent aqueous citric acid, stirred for three hours at 80° while passing in carbon dioxide, let stand for one day, filtered, washed with water, and alkali refined as usual, giving 950 grams of an oil free from fishy odor and containing the same amount of vitamin A. Use of tartaric, oxalic, and(or) malic acid is also specified. (*C. A.* **52**, 4217)

Boiler for deodorization of fats and oils. T. Yamamoto. *Japan. 2780('57).* A boiler for small scale operation is described. (*C. A.* **52**, 5006)

Cacao fatlike product. T. Takatsuki. *Japan. 3121('57).* Palm-kernel oil at 35° is mixed with 4 volumes of methyl ethyl ketone at 15° and the solution is cooled to 6° at a rate of one degree per minute. The crystalline deposit is filtered off and washed with 40 volumes of methyl ethyl ketone at 3°. Catalytic reduction of this solid with 0.1% nickel kieselguhr and hydrogen at ten kilograms per square centimeter for one hour at 170–80° gives a cacao fatlike material having an acid number of 0.11, a saponification number of 247.9, an iodine number of 0.15, and a melting point of 34.9°. Nearly the same result is obtained by treating coconut oil as above. (*C. A.* **52**, 5700)

Hydrogenation of fats and oils. S. Itakura. *Japan. 3279('57).* Herring oil (500 ml.) is hydrogenated with ten grams of previously magnetized Raney nickel for one hour at 100–10° and normal pressure of hydrogen to obtain a product with an iodine number of 63.4 (iodine number obtained with the usual Raney nickel is 67.0). (*C. A.* **52**, 5859)

Wax polish and coating. J. C. Sabater. *Span. 233,914.* To ten parts virgin wax, five parts paraffin, and five parts ozokerite, melted at 70°, is added one part meta-silicic acid or ferric oxide. After heating to 200° for four hours, the mixture is cooled and incorporated into a cellulose support or made into bars or flakes. (*C. A.* **52**, 5010)

FATTY ACID DERIVATIVES

Preparation of high grade saturated aliphatic diacids by the nitric oxidation of saturated fatty monoacids or esters. C. Paquot and R. Perron. *Olearia* **12**, 5–7(1958). A new method is described for the nitric oxidation of saturated fatty monoacids. The oxidation is regulated by the sulfuric acid and nitric acid mixture. The efficiency is 78%, based on the original raw materials. The possibility of the industrial application of this process is seen.

Effect of degree of unsaturation of fatty alcohols on the properties of their sulfated products. II. Preparation of Egyptian cottonseed-oil fatty alcohols of different degrees of unsaturation. Bahi El-Din Gebril(Univ. Alexandria). *Oil and Soap* **4**, 459 (1957). Adkins copper chromite catalyst was used for hydrogenation of the cottonseed oil to make saturated fatty alcohols. A cadmium-copper catalyst was used for preparation of cottonseed oil fatty alcohols of varying unsaturation. For preparation of unsaturated cottonseed oil fatty alcohols by the Bouveault and Blanc process, optimum conditions are reduction at 110° for one hour by adding a mixture: cottonseed oil 10 grams, xylene 200, and tert-butyl alcohol 58.54 grams (15% excess required) over a fifteen-minute period to sodium 34.81 grams (10% excess required) in xylene 50 grams. (*C. A.* **52**, 4213)

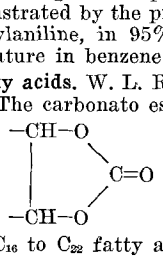
Preparation of mono- and diglycerides from peanut oil and their halogenation. D. K. Mukherjee, C. R. Mitra and A. N. Saha (Univ. Calcutta). *J. Indian Chem. Soc., Ind. & News Ed.* **20**, 23–4(1957). Glycerolysis of peanut oil was carried out with potassium carbonate as a catalyst. The resulting mono- and diglycerides contain hydroxyl groups which were replaced by chlorine by passing dry hydrochloric acid gas through the mixtures of the glycerides at 110°. (*C. A.* **52**, 2429)

Myristic acid and related compounds. J. H. Gustafson(N. Dakota Agr. Coll., Fargo). *Proc. N. Dakota Acad. Sci.* **11**, 19–23 (1957). Trimyristin, melting point 55°, was obtained by Soxhlet methyl ether extraction of nutmeg. Trimyristin was converted into myristamide, melting point 97–102°, by heating with concentrated ammonium hydroxide in a sealed tube for twenty hours at 200°. Myristamide was converted via the first of a 2-step Hofmann hypobromite degradation reaction into methyl tridecylcarbamate, melting point 47–50°. The direct single-step conversion to the amine is not feasible. Myristamide was also prepared from myristic acid via myristoyl chloride. Methyl myristate, boiling at 747 millimeters pressure at 293–7°, was obtained by a Fischer esterification of myristic acid as well as by ester-interchange of methyl alcohol and trimyristin. (*C. A.* **52**, 1920)

The total synthesis of sphingosine. D. Shapiro, H. Segal and H. M. Flowers(Daniel Sieff Research Institute, The Weizmann Institute of Science). *J. Am. Chem. Soc.* **80**, 1194–97(1958). The synthesis of DL-1,3-dihydroxy-2-amino-4-octadecene and its optical resolution is described. The key intermediate, ethyl 2,3-dioxo-4-octadecenoate-2-phenylhydrazone is reductively acetylated to the amide. Selective reduction with sodium borohydride, followed by hydrolysis of the carbinyl leads to the ester hydrochloride which is reduced to racemic sphingosine.

A new method of introducing peroxy groups into organic molecules. M. S. Kharasch and A. Fono(Inst. of Org. Chem., Univ. of Chicago, Chicago, Ill.). *J. Org. Chem.* **23**, 324–5(1958). The discovery of a new reaction was reported. In the presence of trace amounts of copper, cobaltous or manganous salts, alkyl and aralkyl hydroperoxides react readily with organic molecules containing a slightly activated hydrogen, replacing it with a peroxy group. The general applicability of this new method is readily demonstrated by the preparation of N-methyl-N-tert-butylperoxymethylaniline, in 95% yield, from dimethyl aniline at room temperature in benzene as solvent.

Carbonato esters of fatty acids. W. L. Riedeman(Rohm & Haas Co.). *U. S. 2,826,591.* The carbonato ester contains the grouping



and is derived from a C_{16} to C_{22} fatty acid.

Oxyethylated lauryl alcohol steam inhalation composition. L. C. Dick and T. C. Grubb(Vick Chemical Co.). *U. S. 2,828,243.* A composition for steam inhalation therapy consists of an organo polysiloxane, at least one aromatic and oxyethylated lauryl alcohol in which there are 5 to 10 oxyethylene groups for each lauryl alcohol radical.

Reaction products of epoxidized monohydric alcohol esters and hydroxylated tertiary monoamines. M. De Groote and J. Cheng (Petrolite Corp.). *U. S. 2,828,323.* Under oxyalkylation conditions, a hydroxylated tertiary monoamine is reacted with an epoxidized ester of a lower alkanol and a fatty acid or acylated fatty acid in which the epoxidized ester contains about one oxirane ring per fatty acid radical.

Process for obtaining pure products of polymerization of 11-amino undecanoic acid. W. Münch, C. Maderno, L. Notarbartolo and R. Lamma(Perfogit Soc. per Azioni). *U. S. 2,829,127.* Polyamide polymers are prepared by heating 11-amino undecanoic acid in the presence of at least 50% by wt. of water at temperatures above 180° under pressure. The low molecular weight polymer is separated and further polymerized by heat.

Lubricant containing an aliphatic amine salt of monoalkyl ester of a dimeric acid. H. G. Smith and T. L. Cantrell(Gulf Oil Corp.). *U. S. 2,830,021.* A corrosion inhibitor for a mineral oil lubricant is the salt of an aliphatic long chain amine and a monoalkyl ester of a dimeric acid. The dimeric acid is derived from a C_8 to C_{22} polyunsaturated fatty acid.

12-Cyano-12-hydroxystearic acid and esters. T. R. Steadman and J. O. H. Peterson, Jr.(National Research Corp.). *U. S. 2,830,065.* **12-Carboxamido-12-hydroxystearic acid and esters.** *U. S. 2,830,077.* The preparations of these compounds are described.

Spindle oil composition. J. N. Bowden and E. W. Brennan(The Pure Oil Co.). *U. S. 2,830,951.* The load bearing capacity of a mineral lubricating oil is increased by the addition of not less than 0.3% by wt. of methyl ricinoleate and tetramethyl diamino diphenyl methane in a ratio of about 5 to 1.

Gear oil composition. A. A. Manteuffel, E. W. Brennan and J. B. Stucker(The Pure Oil Co.). *U. S. 2,830,952.* The load bearing capacity of an extreme pressure lubricant is increased by the addition of a sulfurized and phosphorized fatty oil and a C_1 to C_5 alkyl ester of a C_{18} monohydroxy monobasic aliphatic acid.

Polyamide grease composition. J. A. Dixon(California Research Corp.). *U. S. 2,830,954.* The grease thickening agent is a polyamide which is prepared by first reacting C_4 to C_{12} aliphatic dibasic acids with an excess of C_2 to C_{22} aliphatic diamines and, then, with C_3 to C_{23} aliphatic monocarboxylic acids to form a product having a molecular weight less than 1000. *U. S. 2,830,955.* The polyamide thickening agent is prepared by reacting C_2 to C_{22} aliphatic diamines with an excess of C_4 to C_{12} dibasic aliphatic acids and, then, with C_2 to C_{22} *n*-primary amines to form a polyamide having a molecular weight less than 1000.

Fatty acid bis(hydroxyalkyl)amides. (Colgate-Palmolive Co.). *Brit. 781,549.* The reaction between esters, such as methyl laurate, and bis(hydroxyalkyl)amines, such as diethanolamine, is exothermic and is facilitated by use of lower temperatures, except that the reactants are normally immiscible. Presence of a fatty-acid bis(hydroxyalkyl)amide gives a single phase and permits the reaction to proceed at an increased rate at lower temperature. (*C.A.* **52**, 2431)

Fatty alcohols. (Thomas Hedley & Co., Ltd.). *Brit. 783,661.* Aliphatic alcohols, containing 6–22 carbon atoms, are produced from the corresponding low-alkyl esters or esters of tallow or coconut fatty acids by hydrogenating at 570°F. at 3000 pounds per square inch with hydrogen containing 0.3–1.4 mole % carbon monoxide, the ratio of ester to hydrogen being 15:1 to 40:1, in the presence of 1–5% copper-chromium oxide catalyst. At throughputs of 1400–1690 pounds per hour of ester, reaction times of 15.3–18.1 minutes and conversions of 95.3–7.8% were found. Carbon monoxide in the feed gives rise to methyl alcohol; the ester alkyl also is converted to a low-alkyl alcohol. Hydrocarbons as by-products amounted to 0.3–0.9%. (*C.A.* **52**, 4216)

Epoxy esters of oleic and (or) linoleic acid. W. D. Niederhauser and J. E. Korcly(Rohm & Haas Co.). *Ger. 857,364.* Oleates and (or) linoleates are treated with a mixture of hydrogen peroxide and formic acid at 10–100°, particularly 20–75°, to give the title compounds, which are useful as plasticizers for film-forming products, e.g., poly(vinyl chloride) and copolymers thereof. Hydrogen peroxide and formic acid are used in amount of 1–2 and 0.25–1 mole, respectively, per double bond of esterified acid. (*C.A.* **52**, 4210)

• Biology and Nutrition

Influence of high-fat diets on growth and development of obesity in the albino rat. J. J. Barboriak, W. A. Krehl, G. R. Cowill and A. D. Wheldon(Dept. of Biochem., Yale Univ. School of Medicine, New Haven, Conn.). *J. Nutrition* **64**, 241–49(1958). The growth-promoting and obesity-producing properties of certain animal and vegetable fats were studied in several rat experiments. The fats were fed at high concentration, contributing 81% of the calories. The vegetable oils tested (corn oil, coconut oil, and cottonseed oil) did not promote growth in young rats as efficiently as lard, Crisco, margarine, or butter. With respect to the obesity-producing properties, lard and Crisco were most effective, then butter and margarine, with corn oil and coconut oil showing the least effect. About 80% of the rats in the lard group reached a weight greater than 1000 gm. Some cases of fatty infiltration of the aortic subendothelium and deposition of fat in livers were noted. No special lesions in relation to any of the high-fat diets could be established.

Effect of dietary protein and fat on changes of serum cholesterol in mature birds. M. Kokatnur, N. T. Rand, F. A. Kummerow and H. M. Scott (Dept. of Food Tech. and Animal Sci., Univ. Ill., Urbana, Ill.). *J. Nutrition* **64**, 177–183(1958). Male chickens, 12 to 18 months of age, were kept for 21 days on diets which contained 7.5, 15, or 30% of protein and 0.1 or 15% of corn oil. Samples of blood were obtained from each bird by heart puncture at the beginning, on the 10th, and on the 21st day of the experimental period and the serum cholesterol level of each sample was determined by the Schoenheimer-Sperry method. The largest increase in serum cholesterol was noted in birds which had consumed the least amount of protein. No apparent relationship existed between serum cholesterol and differences in feed intake or differences in the percentage of calories supplied by dietary fat. The serum cholesterol levels of hypercholesteremic birds dropped rapidly during the three-week experimental period, but it did not drop to normal values in this period of time unless the protein level was high.

Influence of H^3-β-sitosterol on sterol excretion. L. Swell, E. C. Trout, Jr., G. V. Vahouny, Henry Field, Jr., S. von Schuching and C. R. Treadwell(Veterans Ad. Center, Martinsburg, W. Va.). *Proc. Soc. Exptl. Biol. & Med.* **97**, 337–9(1958). An increased fecal excretion of cholesterol and related sterols followed the administration of H^3-β-sitosterol to rats receiving cholesterol-free emulsions containing bile salt and fatty acid. Approximately 53% of the administered labeled β-sitosterol was not recovered in the feces. This study provides additional evidence that plant sterols are absorbed in the same manner as cholesterol and thereby compete with cholesterol for the sterol absorptive mechanism.

Total lipid, cholesterol, and phospholipid content of non-irradiated skin(rabbit). H. P. Schwarz, L. Dreisbach and A. Kleschick(Dept. Biochem., Philadelphia General Hosp.). *Proc. Soc. Exptl. Biol. & Med.* 97, 581–3(1958). Data has been presented on total cholesterol, free cholesterol, phospholipid, and total lipid content of non-irradiated and x-ray irradiated skin of rabbits. Cholesterol of both the non-irradiated or irradiated skin alike comprises mostly free cholesterol and only relatively small amounts, 9–13%, cholesteryl esters. Phospholipids of both non-irradiated or irradiated skin consists of about 48–53% lecithin, 21% phosphatidyl ethanolamine, 11–12% phosphatidyl serine, rather small amounts of ethanolamine-plasmagens, and a relatively large amount, 18–21%, of unidentified phospholipids. Ionizing irradiation of the skin of rabbits has not significantly affected the lipids under study.

Effect of nature of dietary fat on synthesis of cholesterol from acetate-1-C^{14} in rat liver slices. S. Mukherjee and Roslyn B. Alfin-Slater(Univ. Southern Calif., Los Angeles, Calif.). *Arch. Biochem. Biophys.* **73**, 359–65(1958). A comparative study on the incorporation of acetate-1-C^{14} into cholesterol in liver slices has been effected in rats maintained on 4 experimental diets for 1, 4, and 16 weeks. Maximum cholesterol synthesis was observed in the liver of rats receiving a diet containing 15% cottonseed oil. Cholesterol synthesis was markedly reduced in animals receiving a fat-deficient diet and in those receiving the diet containing 30% hydrogenated coconut oil. The addition of the essential fatty acid, linoleic, to the animals on the fat-free diet maintained a normal liver cholesterol level and normal cholesterol synthesis. The depression of cholesterol synthesis in the livers of animals fed the fat-deficient diet may result from the accumulation of cholesterol in the liver which is observed in these rats.

Effect of heparin on serum lipids following intravenous administration of fat emulsion in dogs. H. C. Meng and J. B. Youmans(Vanderbilt Univ. Sch. of Med., Nashville, Tenn.). *Proc. Soc. Exptl. Biol. & Med.* **97**, 691–3(1958). Intravenous infusion of olive oil emulsion produced elevation of serum total fatty acids and possibly total cholesterol, but without consistent changes in lipid phosphorus. Heparin injection simultaneously with fat infusion increased the rate of removal of the intravenously infused fat and lowered serum cholesterol, but produced no significant changes in lipid phosphorus.

α and β lipoproteins and serum cholesterol levels following administration of unsaturated fatty acids. T. D. Labecki, I. B. Bright, W. W. Lake, and C. Thompson(Heart Disease Control Unit, Mississippi State Board of Health, Jackson, Miss.). *Proc. Soc. Exptl. Biol. & Med.* **97**, 260–3(1958). The present study confirmed the group correlation between clinically demonstrable coronary atherosclerosis and abnormally low alpha to beta lipoprotein ratio. Daily administration of 3 g. of safflower seed oil and 4 mg. of pyridoxine for a period of up to 30 weeks, added to the previously administered lipotropes, resulted in a statistically significant increase of alpha to beta lipoprotein ratio starting at the 18-week period. The trend continued for the 24- and 30-week periods in over 70% of the cases. Twenty per cent of the cases showed lowered total serum cholesterol levels.

Influence of the type of solvent extraction upon the food value of the oilseed residue. R. Jacquot, J. Adrian and A. Rerat. *Rev. franc. corps gras* **5**, 3–8(1958). From results using white rats to check the nutritional value of the oilseed pulp after removal of the nutritional oil it was found that use of hydrated ketones or alcohol gave a good product. The classical methods of removing lipids from the oilseed residues gave much poorer results from the viewpoint of nutritional value of the residue left. The effect of temperature shows that high temperatures in extracting will give poorer nutritional values of the oilseed residue.

The effect of nicotinic acid upon serum cholesterol and upon basal metabolic rate of young normal adults. R. Altschul and A. Hoffer(Univ. of Saskatchewan, Canada). *Arch. Biochem. Biophys.* **73**, 420–4(1958). Nicotinic acid in relatively large doses (3 x 1 g. daily) lowered the serum cholesterol in 11 of 12 healthy medical students. The basal metabolic rates increased slightly but significantly. It seems that the relative response of cholesterol levels to nicotinic acid is related to the dosage in terms of body weight as well as to the initial cholesterol level. With dosage constant in terms of weight, the response may depend upon the initial cholesterol levels.

Serum cholesterol and phospholipide levels of Australian aborigines. C. J. Schwartz, A. J. Day, J. A. Peters and J. R. Casley-Smith(Univ. Adelaide). *Australian J. Exptl. Biol. Med. Sci.* **35**, 449–56(1957). The serum cholesterol level of Australian aborigines is lower than that of Australian white controls. In aboriginal females and white males but not in aboriginal males or white females, serum cholesterol level increased with age, to a peak at 40–50 years. Aboriginal female phospholipide levels are higher than for white females or aboriginal males. The ratio of cholesterol level and phospholipide level is lower for aborigines than for whites. Results are discussed in terms of a lower fat intake by aborigines. (*C. A.* **52**, 3961)

Effect of feeding rancid ghee to rats. S. Tawde and N. G. Magar(Inst. Sci., Bombay). *Indian J. Dairy Sci.* **10**, 73–8 (1957). On a diet of sucrose 60, salt mixture 5, fat-free casein 15, and rancid ghee (clarified butter) 20%, supplemented by vitamins, rats gained less weight in eight weeks than when the fat was supplied by fresh ghee, a result attributed to greater food intake with fresh ghee. No diarrhea occurred from either diet. No differences were observed as to average weight of liver, kidneys, heart, or spleen on autopsy, cholesterol and phospholipide content of the liver, brain, or blood, or as to the digestibility of the fat. Diet with fresh ghee showed linoleic acid in the fecal fat, absent in the case of diet with rancid ghee. Vitamin A was absent in the liver fat in the case of diet with rancid ghee. Protein metabolism was not as efficient in the case of diet with rancid ghee, which may have been a cause of slower growth. (*C.A.* **52**, 3953)

Poisoning with rancid cod-liver oil in silver foxes. Cz. Kaszubkiewicz, L. Wartenberg, and J. Zwierzchowski(Wyższa Szkoła Rolna, Wrocław). *Med. Weterynar. (Poland)* **13**(4), 228–33 (1957). Fatal poisoning of silver foxes was caused by rancid fish oil used as a feed supplement. Chemical analysis of the oil showed high degree of rancidity: peroxide number 18.9 (vs. 3.0 for the fresh cod-liver oil), acid number 24.3, iodine number 152, and a positive Kreis test for aldehydes. Biological tests conducted on white rats confirmed the poisoning effect of the oil. (*C.A.* **52**, 2299)

Fat in human nutrition. Dietary fat—its role in nutrition and human requirement. L. E. Holt, Jr.(New York Univ., New York, N. Y.). *J. Am. Med. Assoc.* **164**, 1890–4(1957). A review with 29 references.

Biochemical aspects of lipide and lipoprotein metabolism. D. S. Fredrickson(Natl. Insts. of Health, Bethesda, Md.). *Ibid.* 1895–9. The review summarizes aspects of basic knowledge concerning lipide transport mechanisms and fat metabolism that are of clinical importance. 20 references.

Pathological lesions related to disturbances of fat in man. W. S. Hartroft and W. A. Thomas(Washington Univ., St. Louis, Mo.). *Ibid.* 1899–1905. A review with 22 references.

Dietary control of serum lipides in relation to atherosclerosis. E. H. Ahrens, Jr., J. Hirsch, W. Insull, Jr., T. T. Tsaltas, R. Blomstrand, and M. L. Paterson(Rockefeller Inst., New York, N. Y.). *Ibid.* 1905–11. Mainly a review of data relative to the unproven hypothesis that dietary fats affect atherogenesis with the conclusion that radical changes in dietary habits cannot yet be recommended 18 references.

Diet and the epidemiology of coronary heart diseases. A. Keys (Univ. of Minnesota, Minneapolis). *Ibid.* 1912–19. A review with 26 references.

Nutritional studies relating to serum lipides and atherosclerosis. Therapeutic implications. F. J. Stare, T. B. Van Itallie, Mary B. McCann, and O. W. Portman(Harvard School of Public Health, Boston, Mass.). *Ibid.* 1920–5. (*C.A.* **52**, 2192)

Dietary fat and hypercholesteremia in the Cebus monkey. II. Esterification and disappearance of cholesterol-4-C^{14}. O. W. Portman and L. Sinisterra(Harvard School of Public Health, Boston, Mass.). *J. Exptl. Med.* **106**, 727–42(1957). Three groups of monkeys, one fed a diet including 45% of the calories as corn oil, one fed corn oil plus 0.1 gram of cholesterol per one hundred calories, and one fed lard plus cholesterol for five months were injected with 0.005 millicurie of cholesterol-4-C^{14} emulsified with water. Specific activity for free serum cholesterol was greater than that for total cholesterol within one hour after the injection. After seven months on diets including corn oil plus cholesterol and lard plus cholesterol, the levels of lipide in most tissues were not different for the two dietary groups, nor were they appreciably elevated above previous control figures for monkeys not fed cholesterol. The mean total lipide content of the adrenals of three monkeys fed corn oil was 30.9%; in three fed lard was 14.9%. The mean serum β-lipoprotein value with an S_f of 0-11 was 430 milligrams per one hundred milliliters and with an S_f of 12–20 was 216 milligrams per one hundred milliliters in three monkeys fed corn oil; corresponding values for two monkeys fed lard were 150 and 78 milligrams per one hundred milliliters. In monkeys fasted before and after gastric intubation of a test meal containing 0.66 milligrams of cholesterol-4-C^{14}, the disappearance of total cholesterol from the serum consisted of a rapid, followed by a slow, exponential function. The rate of disappearance of cholesterol-4-C^{14} from the serum depended on the type of fat; it was most rapid with safflower and slowest with lard. (*C. A.* **52**, 2196)

Alteration of serum cholesterol by dietary fats. W. D. Armstrong, J. Van Pilsum, A. Keys, F. Grande, J. T. Anderson, and L. Tobian(Univ. of Minnesota, Minneapolis). *Proc. Soc. Exptl. Biol. Med.* **96**, 302–6(1957). Serum total cholesterol concentration was measured in 122 young men and 19 young women before and after 9 days during which each person ingested daily 57 grams of corn oil, olive oil, safflower oil, or butterfat (emulsified in milkshakes). The subjects were instructed to follow their usual diets during this period and body-weight measurements indicated that the experimental fats did not supplant an equal quantity of ordinary diet calories, since all gained some weight. Those who ingested butterfat showed a slight but statistically insignificant rise in serum cholesterol while the other groups showed a decrease averaging 23 ± 2.8 milligrams per 100 milliliters of serum with corn oil, 18 ± 4.6 with safflower oil, and 10.7 ± 2.3 with olive oil. Compared with safflower oil the corn oil was more saturated (iodine value 126.7 vs. 144.2) and contained less linoleic acid (57.5 vs. 72%). Hence it appears that the cholesterol depressant action of the corn oil is not fully accounted for by its degree of unsaturation or its content of essential fatty acid. (*C.A.* **52**, 3950)

Atherosclerosis: a hypothesis concerning the initiation steps in pathogenesis. D. Harman(Univ. of California, Berkeley). *J. Gerontol.* **12**, 199–202(1957). Three steps are proposed in atherogenesis: oxidation followed by polymerization of serum lipoprotein constituents; anchoring of the oxidized materials

in the arterial wall; and an inflammatory reaction induced in the arterial wall by these condensed products. The importance of the first two processes increases with age, while that of the third declines. (*C.A.* **52**, 4798)

Effect of dietary lipides on the lipides in rat milk. L. E. Hallanger and M. O. Schultze(Univ. of Minnesota Agr. Inst., St. Paul). *Proc. Soc. Exptl. Biol. & Med.* **96**, 473–6(1957). Spectrophotometric determinations of polyenoic acids showed that the milk of rats whose diet contained methyl linoleate as the only source of fatty acid contained significant quantities of unconjugated dienoic, trienoic, and tetraenoic acids. Feeding of vegetable oils caused a great increase in concentration of unconjugated dienoic acid and lesser increases in trienoic and tetraenoic acids in the milk fat. (*C.A.* **52**, 4760)

Turnover rate of unesterified fatty acids in human plasma. S. Laurell(Univ. Lund, Swed.). *Acta Physiol. Scand.* **41**, 158–67 (1957). The disappearance rate of unesterified palmitic and oleic acids in human plasma was determined after varying periods of fasting and after administration of glucose. Although the biological half-life increased during prolonged fasting, the turnover was large enough to satisfy the bulk of the caloric requirements, at least after three days' fasting. (*C.A.* **52**, 4761)

Essential fatty acids in human nutrition. L. Söderhjelm(Hosp. Skellefteå, Swed.). *Proc. Symposium on Nutritive Aspects of Preserved Food, Swedish Inst. Food Preserv. Research, Göteborg,* **Publ. No. 115**, 138–43(1954). This is a general discussion of the importance of polyunsaturated fatty acids in human nutrition. The meconium of new-born babies showed a demonstrable amount of polyunsaturated fatty acids as did human fetuses that were in various stages of development. Litters from rabbits that received cod-liver oil showed fatty acids high in hexaenoic acids and dienoic acids, whereas those that received corn oil showed fatty acids high in dienoic acids. Human fetuses from mothers that received cod-liver oil or sesame oil for some days before surgical abortion showed fatty acids somewhat higher in tetraenoic acid and dienoic acids than control fetuses. Abundant fatty acids in cod-liver oil, sesame oil, or corn oil increased in amount in the breast milk of mothers within 1 or 2 days after they began to receive two tablespoonfuls of any one of these oils daily. (*C. A.* **52**, 5571)

Stabilized fat-soluble vitamins. A. Rosenberg. *U. S. 2,828,206.* Discrete, free-flowing particles are prepared from an inner core of fat-soluble vitamin material coated first with a shell of a fat-insoluble substance such as protein, gums, carbohydrates or pectin, and then with a member of the group consisting of fats and waxes having a melting point between 45 and 95°.

Food color. M. A. Perret(Chas. Pfizer & Co., Inc.). *U. S. 2,830,908.* The desired pigment is prepared by heating at 95 to 125° a bixin ester or a nor-bixin di-ester in a liquid ester of a higher fatty acid.

• Drying Oils and Paints

Action of organo-aluminum compounds on fatty acids and the preparation of new drying oils. J. Weiss(Institut des Peintures et Vernis de Stockholm, Sweden). *Rev. franc. corps gras* **5**, 63–74(1958). The author discusses the preparation of new drying oils in which the fatty acids have been treated with an organo-aluminum compound to form new drying oils of higher viscosity. The oils are usually thickened at a temperature of about 300° although some are made at a temperature of 100–120°. Fourteen figures and four tables give the results.

Dehydration of castor oil under reduced pressure. Li-Tsoung Lee and Muh-Gen Jaw(Cheng-Kung Univ.). *Chemistry (Taiwan)* **1956**, 257–62. Light colored dehydrated oil, which dried in five days, was obtained when 1% of catalyst (sodium acid sulfate) was heated with castor oil at 250° and 20 millimeters pressure for 0.5–1 hour. (*C.A.* **52**, 4213)

Structural changes on heating linseed oil. K. D. Ledwoch and K. H. Wüllenweber(Rheinpreussen A.-G. Bergbau u. Chem., Homberg/Niederrhein, Ger.). *Fette, Seifen, Anstrichmittel* **58**, 516–18(1956). The change in the extinction coefficient for 965-centimeters^{-1} light was used to follow the relative amount of *trans* in the *cis-trans* conversion of linseed oil with heating. With an inert atmosphere, the reaction begins to attain reasonable velocity at 250–60°; with a sulfur dioxide atmosphere, however, the extinction coefficient shows a maximum at 260° rather than rising to a limit. (*C. A.* **52**, 4206)

Molecular enlargement of drying oils under the influence of hemins. H. P. Kaufmann and B. Hambrock(Univ. Münster/Westf., Ger.). *Fette, Seifen, Anstrichmittel* **58**, 520–7(1956). The interactions involved when unsaturated oils oxidize in the presence of a large number of hemin derivatives are examined. Hemins accelerate the autoxidation of conjugated oils. The effect is a function of the complex-bound heavy metals. The iron complexes are the most effective, followed by cobalt, manganese, and lead. Metal-free heterocyclic systems catalyze autoxidation only under limited conditions of illumination and temperature (photocatalysis). Nonconjugated oils, drying in the presence of metal naphthenates, were less influenced by hemins than the conjugated oils. (*C. A.* **52**, 4206)

Tall oil and its derivatives. A. B. Doran. *Paint Ind. Mag.* **72** (12), 21–58(1957). A brief sketch of the tall-oil industry and its history. (*C.A.* **52**, 4999)

Improvement of the drying properties of vegetable oils by heating with furfural. R. Rigamonti and E. S. Marchetti. *Peintures, pigments, vernis* **33**, 801–4(1957). By heating drying or semi-drying oils with 2-furaldehyde in the absence of air, the drying properties are increased. This has been demonstrated for grapeseed, cotton, soya, and linseed oils by using about 30% 2-furaldehyde and heating for up to eight hours at 90–140° Drying times were reduced by half. By examination of ultraviolet spectra of the oils and analysis for the 2-furaldehyde used in the reaction it was concluded that the decreased drying time was due to isomerization of linoleic and linolenic components to conjugated double bond systems. (*C.A.* **52**, 2423)

Rheological properties of printing inks. B. N. Shakhkeldyan *Paint Technol.* **22**, 43–8(1958); translated from *Kolloidny Zhurnal* **18**, 111–9(1956). The viscosities of printing inks fall sharply as the rate of shear increases. The greatest decrease in viscosity is found in inks with a tendency to gelation. Measurement of the relative viscosities of printing inks can be a means of determining the stabilizing power of drying oils. Inks containing polymerized linseed drying oils have lower relative viscosities and less rigid, more elastic structures than do inks made with raw linseed oil. A Milori Blue ink is described which does not thicken with water and can be used without interruption in offset printing.

Polyvinyl chloride resin compositions containing organotin mixed salts of a fatty acid and maleic acid. C. R. Gloskey(Metal & Thermit Corp.). *U. S. 2,826,561.* A stable polyvinyl chloride resin composition contains an organotin salt having a molar ratio of fatty acid to maleic acid in the range of 2:1 to 3:1.

Stabilizer for resins. C. R. Gloskey(Metal & Thermit Corp.). *U. S. 2,826,597.* A resin stabilizer is prepared by the reaction of one mole of a dihydrocarbon tin oxide (alkyltin, phenyltin or benzyltin oxide) with about one mole of a fatty acid and half a mole of maleic anhydride.

Linoleum cements. L. H. Dunlop(Armstrong Cork Co.). *U. S. 2,828,215.* A composition of matter suitable for use in the manufacture of lineoleum cements by oxidation at 160 to 240°F. is prepared from 57 to 69% by wt. of a drying oil, 13 to 21% of rosin, and 10 to 30% of an oxidized fraction of tall oil substantially free from saturated fatty acids and having a viscosity between 15 and 25 seconds.

Process of preparing tung oil varnish resins. L. L. Hopper, Jr. U. S. A., Sec'y. Agr.). *U. S. 2,829,064.* A gas-proof, non-gelling tung oil varnish resin having rapid air drying rate is prepared by heat bodying at 550°F. or above a mixture of a drying oil (at least 50% by wt. of tung oil), zinc rosinate, and 1 to 5 parts by wt. of a rosin-polyhydric alcohol product prepared by the reaction of rosin with glycerol, pentaerythritol, or pentaerythritol and maleic anhydride.

Interpolymer of nuclear methylated styrenes, esters of drying oil acids and dialkenyl aromatics. N. R. Peterson, W. A. Henson and D. P. Churchfield(The Dow Chemical Co.). *U. S. 2,830,961.* The interpolymer is prepared from a monomer mixture containing 10 to 60% by wt. or at least one nuclear methylated styrene, 35 to 85% of at least one polyhydric alcohol partial ester of a polyunsaturated fatty acid, and 0.4 to 5% of at least one dialkenyl aromatic hydrocarbon. The interpolymer can be dispersed in mineral spirits to form a varnish which air dries to a clear solid film.

Polymerization of drying oils. H. P. Kaufmann and K. Strüber. *Ger. 927,528.* Drying oils are polymerized with themselves or with other polymerizable substances with organic radicals, e.g., triphenylmethyl. (*C.A.* **52**, 4210)