ature data for the analysis of fat and oil samples they may be using in their work but should themselves obtain an analysis on each sample used. b) Contrary to the opinion apparently held by many research people, the data show that fats that are often referred to as "solid" or "saturated" are in fact predominately liquid or unsaturated. For example, only 11–21% of the glycerides of margarine are solid at room temperature, the remaining 79–89% being liquid. Similarly 70–85% of the glycerides of shortenings are in the liquid state at room temperature.

It should be added that even as this is being written, the knowledge of fatty acid composition of fats and oils is moving forward at a pace so accelerated by the recently developed technique of vapor phase chromatography that much of the data contained herein may soon be obsolete.

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

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• Fats and Oils

Deacidification with Urea of Peanut Oils of Low and Medium Acidity. M. Louty (Inst. tech. Corps Gras, Paris). *Olearia* 11, 213–17 (1957). Peanut oils with acidity of 1, 2.2, 3.5, 5, 10, and 15% were agitated at room temperature with varying amounts of urea and water. Optimum conditions were with urea at five times the fatty acid content of the oil and water at 45–60% of the urea used. Urea micella from one run with additional urea is used on the following run. Addition of water and centrifuging are used to separate final products. Satisfactory results are obtained when acidity is 1–5%. Below 1% the reaction decreases and above 5% greater difficulty in centrifuging is encountered. The method is economical but it does not deacidify completely. (*C.A.* 53, 1785)

Preparation of Monoglycerides from Olive Oil by Glycerolysis in the Presence of Urea. R. Rigamonti and Amelia Vacirca (Turin Polytech. Italy). *Olearia* 12, 49–52 (1958). Olive oil 20, glycerol 10, potassium hydroxide 0.28, urea 100 parts, and a solvent are agitated at room temperature 6–28 hours. The solvents used are acetone at 80% of total volume, isopropanol 170 ml., and a 1:1 mixture of the two, 200 ml. After 23 hours the first yields 73% esters containing 41% monoglycerides; after 19 hours, the second, respectively, 64.5 and 53.0; and after 5 hours, the third, 97.5% and 61.9%, and after 22 hours, 99% and 54.17%. Yield of monoglycerides is not above 62% because the di- and tri-glycerides are occluded in the precipitate formed. The acetone acts only as a solvent while the isopropanol enters into the esterification reaction. (*C.A.* 53, 1785)

Use of Trichloroethylene in Processing Olive Pulp. M. Catalano (Univ. Bari, Italy). *Olearia* 11, 257–61 (1957). The results from hot and cold trichloroethylene extractions of olive pulp with and without moisture are tabulated. In cold extraction of the pulp containing moisture, oil yield is 1% greater than when the pulp is free of moisture; but impurities in the oils are, respectively, 7.23 and 6.54%. Hot extraction increases the impurities to about 12.4 and 11.3% from moist and dry pulp, respectively. (*C.A.* 53, 1785)

Bleaching of Vegetable Oils. B. Ya. Sterlin. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Zhirov* **1954**(15), 105–13. Bleaching test results on cottonseed and rapeseed oils with domestic activated bleaching earths (gumbrin, askanite, tripolite) are given. Recommendations are given on pressing technique for cottonseed oil to lower color caused by gossypol derivatives. The use of bleaching earths is recommended also for bleaching of rapeseed oil in place of acid refining. (*C.A.* 53, 1785)

The Four Temperatures Test. IV. Winterization and Identification of Oils. G. B. Martinenghi. *Olearia* 12, 97–9 (1958); *ibid.* 11, 126–12 (1957). The four temperatures at which an oil becomes, respectively, cloudy, immobile, fluid, and clear are used to identify the oil. Data from nineteen samples show these points are about the same for refined oils from the same source, provided the oil has not been through the winterization process. The refined oils must be neutral and composed entirely of their particular glycerides. (*C.A.* 53, 1784)

Modern Technology of Fats and Fatty Products. LI. The Comminution of Raw Materials. H. P. Kaufmann and J. G. Thieme (Inst. f. Fettforschung, Münster, Ger.). *Fette, Seifen, Anstrichmittel* 60, 570–8 (1958). (*C.A.* 53, 1784)

Oilseeds. B. Y. Rao (Central Food Technol. Research Inst., Mysore, India). *Lit. Rev. Oils & Fats* **1956**, 1–4 (Pub. 1958).

Processing of Oils and Fats. *Ibid.* 10–26.

Chemistry, Characteristics, Composition, and Analysis of Oils and Fats. *Ibid.* 27–55.

Spoilage. *Ibid.* 56–62.

Nutrition and Metabolism. *Ibid.* 63–72. (*C.A.* 53, 1784)

Application of Spectrophotometry in the Study of Vegetable Oils. F. Minutilli. *Rass. chim.* 10(3), 24–7 (1958). A review, predominantly of French and U.S. literature, with 101 references. (*C.A.* 53, 1784)

Application of the Trichromatic Technique for the Study of the Bleaching of Fats with Earths. Influence of the Treatment on Certain Properties of the Bleached Products. C. Trizis and A. Uzzan (Iterg, Paris). *Rev. franç. corps gras* 5, 499–514 (1958). Two tallows and two lards were treated 30 minutes with 0.1, 0.2, 1.0% of different bleaching earths at 60, 80, 100°. The decrease of the color was determinted by the trichromatic method. Increasing the amount of bleaching earths is more efficient than increasing the temperature. (*C.A.* 53, 1784)

A Rapid Determination of the Hydroxyl Number. V. Vasilescu. *Fette, Seifen, Anstrichmittel* 60, 541-4 (1958). The conventional method for the determination of the hydroxyl number of fatty alcohols, acids, and carbohydrates is shortened from 60 to 10 minutes by increasing the temperature of acetylation from 105 to 130–50°. The accuracy is not affected. (*C.A.* 53, 1784)

The Separation of Higher Fatty Acids by Paper Chromatography with the Use of Change of Solvent Concentration During Development. V. Palo, V. Koman, and Z. Hrabe (Slovenská vysoká škola tech., Bratislava, Czech.). *Chem zvesti* 12, 525–32 (1958) (German summary). The method and results of separation of higher fatty acids by paper chromatography by using continuous change of mobile phase are described. It was possible to accomplish the separation on the whole width of the Whatman 3 filter paper with any number of samples. (*C.A.* 53, 1783)

Comparative Study of Pataua and Olive Oils. Maria de Lourdes Padua (Inst. Oleos, Rio de Janeiro). *Olearia* **11**, 262–4 (1957). An average of 56.4 mg. of squalene per 100 g. of oil were found in the crude pataua oil, 49.5 in the refined, and 220.3 in the olive oil. The $n^{40/D}$ for olive oil was 1.4623 and $n_F–n$ 0.00985, for refined pataua with 0.2% acidity 1.4617 and 0.00984, and for filtered pataua with 5.5% acidity 1.4612 and 0.00983. (*C.A.* **53**, 1785)

Water Content of Fats Used for Fabrication of Margarine. M. Loury and G. Lechartier (Iterg, Paris). *Rev. franç. corps gras* **5**, 550–2 (1958). The method of Smith and Bryant (*C.A.* **29**, 3940) is adapted to the determination of extremely small quantities of water (less than 0.1%) in good colored fats with low acidity. Dissolve *p* (about 10) g. of fat in 20 ml. toluene, add 10 ml. pyridine and 10 ml. acetyl chloride, and shake 20 minutes. Decompose the excess acetyl chloride by shaking 10 minutes with 10–20 ml. and determine the ml. of 0.5 normal potassium hydroxide employed, respectively, for the titration of the liberated acetic acid *(a)* and of a blank *(b)*. % water = 18 *(a-b)* (100)/200 *p*. (*C.A.* **53**, 1578)

Influence of Heat and Air Oxygen on Gossypol. V. P. Rzhekhin. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Zhirov* **1954** (15), 55–73. Heating crystallized gossypol in air decreases its neutralization value, acid hydroxyls, and aldehyde groups; increases coloring ability; spectral bands appear in areas: 4400, 3500–3550, 2650–2660, 2350–2400 A.; and mean molecular weight increases. These changes are greater, the higher the temperature. The changes start at temperature over 60°, but up to 115° they proceed slowly. At 130° and higher temperature more substantial changes connected with formation of more complex compounds appear. The changes are slower when heating in atmosphere of water vapor and of carbon dioxide. On heating gossypol dissolved in refined oil disappearance of aldehyde occurs simultaneously with decrease in acidity. The intensive brown color of crude cottonseed oil does not depend on gossypol alone, but on reaction products of gossypol with other constituents of cottonseed oil, particularly with phospholipides. Therefore, intensity of changes depends not only on temperature and duration of heating, but on size of surface in contact with air. (*C.A.* **53**, 742)

Detection of Trace Metals in Fats by Emission Spectrography. K. Täufel and K. Barthel. *Fette, Seifen, Anstrichmittel* **60**, 534–6 (1958). An apparatus and procedure are described which permit direct detection of 5×10^{-7} g. copper, 5×10^{-6} g. iron or nickel per 1 ml. oil. (*C.A.* **53**, 1783)

Paper Chromatography of Steroids from Animal and Plant Fats. J. C. Riemersma and W. Stoutjesdijk (Rijkszuivelstation, Leiden, Neth.). *Mitt. Gebiete Lebensm. u. Hyg.* **49**, 115–20 (1958). Methods for the paper chromatographic separation of sterols from vegetable and animal fats are compared. Spraying of chromatograms with phosphomolybdic acid to development of spots gave better results than an antimony trichloride spray. Stigmasterol can be detected in mixtures with other sterols by chromatographing bromides of sterol acetates. The possibility of using this method for the detection of adulteration of vegetable oils with animal fats is discussed. (*C.A.* **53**, 1783)

Peroxides in the Field of Fatty Substances. C. Paquot (C.N.R.S., Bellevue, France). *Actions chim. et biol. radiations* **4**, 3–17 (1958). Autoxidation of fatty materials is reviewed in regard to chemical mechanism, decomposition products, methods for analyses, and relative rates for different fatty acids. (*C.A.* **53**, 1783)

Glyceridic Structure of Natural Fats. P. Savary, J. Flanzy, and P. Desnuelle (Fac. sci., Marseille). *Rev. franç corps gras* **5**, 493–8 (1958). Structure of natural glycerides is studied by analysis of acids liberated by pancreatic lipase which liberates α-acids preferentially. Determinations of the iodine numbers of the acids liberated by the partial hydrolysis and those in the unsplit portion showed that in beef tallow, sunflower oil, and cacao butter the saturated acids occupy preferentially the external positions and that the reverse is true only for pig fat. (*C.A.* **53**, 1783)

Investigation of the Composition of Fatty Acids Obtained by Oxidation of Paraffin. N. K. Man'kovskaya and F. I. Asnina. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Zhirov* **1954**(15), 212–17; *Referat. Zhur., Khim.* **1956**, Abstr. No. 34316. The possibility of application of the adsorption-chromatographic analysis (aluminum oxide and silicon dioxide gel) for the separation of products, formed in the preparation of synthetic fatty acids from paraffin, was tested. A method for combined separation of methyl esters of fatty acids first on silicon dioxide gel and then on aluminum oxide was worked out and proposed. The method permits the separation of ester mixtures into groups according to functional substituents in the acid radical. (*C.A.* **53**, 210)

Reactivity of the Double Bond of Oleic Acid Esters. N. P. Bulatskii. *Trudy Odessk. Univ.* **4**, 103–7 (1954); *Referat. Zhur., Khim* **1956**, Abstr. No. 39425. The rate of oxidation of the esters of oleic acid (potassium permanganate in acetone) in relation to the structure of the ester alkyl radicals (methyl, ethyl, propyl, butyl) was studied. The increase in size of the alkyl radical decreases the rate of oxidation of esters of oleic acid. (*C.A.* **53**, 211)

Stability of Carotene and Vitamin E in Fat Solution in Relation to the Peroxide Number. B. G. Savinov and A. A. Mikhaĭlovnina (Inst. Org. Chem., Acad. Sci. Ukr. S.S.R., Kiev). *Vitaminy, Akad. Nauk Ukr. S.S.R., Inst. Biokhim.* **3**, 66–9 (1958). The stability of carotene and vitamin E solutions in fats decreased with increasing peroxide number. Carotene and vitamin E were dissolved in methyl oleate having the peroxide number 0, 3.79, and 6.20, respectively, and in methyl butyrate having the peroxide number 0, 0.08, and 0.14. The degradation rate was higher in solutions having higher peroxide number. (*C.A.* **53**, 520)

Relation Between Rate of Degradation of Carotene and Vitamin E in Fat Solutions and the Degree of Unsaturation of Fat. B. G. Savinov and A. A. Mikhaĭlovnina (Inst. Org. Chem., Acad. Sci. Ukr. S.S.R., Kiev). *Vitaminy, Akad. Nauk Ukr. S.S.R., Inst. Biokhim.* **3**, 60–5 (1958). The investigation of the rate of degradation of carotene dissolved in fats of varying degree of saturation showed that carotene was more stable in fats having a higher degree of unsaturation. The rate of degradation of vitamin E dissolved in methyl pelargonate was approximately equal, indicating that the unsaturated part of fat does not affect the stability of this vitamin. (*C.A.* **53**, 520)

A Study on the Rancidity of Stored Wheat Flour. A. B. Vakar, N. I. Sosedov, V. A. Shvetsova, Z. B. Drozdova, and A. T. Naymova. *Biokhim Zerna, Sbornik* **1958**(4), 206–28. Deterioration of flour is accompanied by oxidative and hydrolytic processes, involving the oxidation of double bonds of fatty acids, hydrolysis of glycerides, and the formation of lactides and estolides. However, no significant changes are observed in such fat characteristics as the iodine or saponification number. The increase of the acid value, which is considerable, bears no direct relation to the degree of rancidity. There is no accumulation of aldehydes or low-molecular-weight fatty acids, hence these compounds are not the cause of the specific taste and odor of rancid flour. (*C.A.* **53**, 596)

New Tall-Oil Fraction. M. G. Bestul, I. A. Stine, and J. C. McManus (West Virginia Pulp & Paper Co., Charleston, S.C.). *Soap Chem. Specialties* **34**(10), 49–51 (1958); *Chem. Specialties Mfrs. Assoc., Proc. 41st Mid-Year Meeting, May* **1958**, 150–2. A soft waxy material separated from saponified tall oil according to U.S. 2,591,885 is described and compared with lanolin in regard to chemical and physical characteristics. The product is essentially a fatty ester of high-molecular-weight alcohols and plant sterols and is useful as a soap additive, rust preventive, emulsifier and for many other purposes. (*C.A.* **53**, 735)

Investigation of Composition of Unsaponifiable Matter Obtained by Thermal Treatment of Soap in Manufacturing of Synthetic Fatty Acids. N. K. Man'kovskaya and T. V. Tyutyunnikova. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Zhirov* **1594**(15), 217–19. Unsaponifiable matter obtained from oxidized Drohobycz paraffin, which had acidity 0, saponification value 22.4, carbonyl value 77.5, hydroxyl value 25.5, containing about 40% of ketones, was investigated. Ketones could not be separated by reaction with semicarbazones, because the reaction continues to resinification and splitting to carboxylic acids. This occurs in the presence of β-ketones. Analyses show: hydrocarbons (38%); solid ketones with mean number of carbon atoms 21–22 (28%); liquid ketones with mean number of carbon atoms 8–9 (9%); two functional derivatives, perhaps keto alcohols. Alcohols and ketones were not separated. (*C.A.* **53**, 742)

Study of the Panzer-Niebuer Method of Separation of Sulfated Products Prepared from Castor Oil. M. Ceamis. *Ind. uşoară* (Bucharest) **5**, 204–6 (1958). In studying the separation of emulsified and emulsifying components of sulfated castor oils by extraction with petroleum ether and ethyl alcohol, it was found that addition of ethyl ether, recommended by Dietsche and Luebbe, gives more correct results than does the original method of Panzer and Niebuer. (*C.A.* **53**, 741)

VARIATION OF THE PROPAGATION OF SOUND IN A MIXTURE OF LINSEED OIL AND PETROLEUM AT TEMPERATURES BETWEEN 10° AND 50°. A. Illényi and T. Tarnoczy. *Magyar Fiz. Folyóirat* **6**, 24–35 (1958). A sonic interferometer was constructed to measure the propagation of sound as a function of temperature. The relation between the decrease of velocity in the mixture and increase of temperature was linear. The velocity increases with density; this is due to the change in adiabatic compressibility brought about by the changes in intermolecular forces. Two inflection points in the curve of velocity of propagation of sound as a function of the per cent composition of the mixture are explained on the basis of the changes of intermolecular forces. (*C.A.* **53**, 741)

CHEMICAL EXAMINATION OF ARGEMONE MEXICANA SEED OIL AND ITS UTILIZATION. E. H. Chiniwala and C. M. Desai (M.T.B. Coll., Surat). *J. Indian Chem. Soc., Ind. & News Ed.* **20**, 70–4 (1957) (in English). Chemical composition and physical properties of *Argemone mexicana* seed oil are reported. Utility of the oil was determined by sulfation and cold saponification. Drying properties when mixed with linseed oil are reported. (*C.A.* **53**, 741)

LOSS OF OIL DURING HYDROGENATION. N. V. Vengerova. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Zhirov* **1954**(15), 128–37. A laboratory method for determination of oil loss during hydrogenation, which can be adapted for production control, was developed. To decrease loss of oil one should decrease the hydrogenation temperature, reduce the processing time at 240–250° to 3–3.5 hours, and decrease the water content of the hydrogen used. (*C.A.* **53**, 741)

LOAD STRENGTH OF HIGH-OIL-CONTENT SUNFLOWER-SEED SHELLS. V. V. Klyuchkin. *Masloboino-Zhirovaya Prom.* **24** (9), 14–6 (1958). Data are presented to show that the size grading of sunflower seeds prior to decortication is of no practical value to oil-mill industry, since there is no relation between the load strength of the shell and the size of seed. (*C.A.* **53**, 740)

BALANCE OF COMMODITY AND PURE OIL BY EXTRACTION OF SOYBEANS. E. A. Semenov. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Zhirov* **1954**(15), 94–104. Extraction plant balances show 0.44–0.72% more oil than do analytical results on the original soybeans. This is attributed to decomposition of lipoproteins and sugar lipides which release phospholipides into oil and solvent during plant processing, but not by analytical Soxhlet extraction in the laboratory. (*C.A.* **53**, 740)

DETERMINATION OF FAT IN SOYBEAN, SUNFLOWER, AND FLAX SEEDS, AND OIL CAKES WITH USE OF VARIOUS SOLVENTS. V. P. Rzhekhin and N. I. Pogonkina. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Zhirov* **1954**(15), 73–94. Use of ethyl ether gives results which are 0.19–0.86% higher than with the use of petroleum ether. Ethyl ether is recommended for production control. (*C.A.* **53**, 740)

DETECTION OF PALM-KERNEL OIL IN COCOA BUTTER WITH THE AID OF PARTITION CHROMATOGRAPHY. W. Wachs and P. Petscha (Tech. Univ. Berlin-Charlottenburg, Ger.). *Z. Lebensm.-Untersuch. u. -Forsch.* **108**, 244–55 (1958). The method is based on lauric acid determination. This method permits detection of additions down to 1% of palm-kernel oil in cocoa butter; at additions of 5 to 1% of palm-kernel oil the possible error is about 8%. The method is suitable for analysis of chocolate and its products. (*C.A.* **53**, 740)

CARBONATE SAPONIFICATION. F. V. Nevolin. *Trudy Vsesoyuz. Nauch.-Issledovatel Inst. Zhirov* **1954**(15) 205–8. Pilot plant and plant saponifications of fatty acids with sodium carbonate were carried out. Neutralization of fatty acids was completed within the first five minutes. At equivalent amounts of fatty acids and sodium carbonate, as well as 10, 20, and 30% excess of fatty acids, about 4% of sodium carbonate did not participate in the reaction; fatty acids in excess of 40% sodium carbonate reacted completely. (*C.A.* **53**, 740)

DISTILLATION OF FATTY ACIDS SEPARATED FROM BLACK COTTONSEED SOAPSTOCKS. F. V. Nevolin. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Zhirov* **1954**(15), 202–5. The results of plant distillation of fatty acids from black cottonseed oil soapstock containing 6% nonfatty matter are given. Yield is 82–3% (based on calculated fatty acids). Flow sheet and detailed conditions are given. Distillation of those soapstocks containing high amounts of nonfatty matter would be profitable. (*C.A.* **53**, 739)

POSSIBILITY OF FORMATION OF HYDROXY ACIDS DURING PROCESS OF PRODUCTION OF OIL. V. P. Rzhekin and N. I. Pogonkina. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Zhirov* **1954**(15), 4-11. In double pressing of sunflower with expeller presses the amount of hydroxy acids increased by 0.16% (on weight of seeds, determined after Fahrion). Increase of hydroxy acids was observed during preparation of pulp but not during pressing. The oxidation process was activated by the presence of oxygen during cooking. (C.A. 53, 739)

EFFECT OF USED CATALYST ON THE HYDROLYSIS OF HYDROGENATED FAT. V. I. Goldeneev, K. G. Bogareva, E. I. Bobkova, and O. N. Dobrynina (Polytech. Inst., and S. M. Kirov's Oil-Fat Combine, Gorki). *Masloboino-Zhirovaya Prom.* **24**(9), 17–22 (1958). The study revealed that used copper-nickel catalyst contained up to 8% of nonextractable magnesium, calcium, nickel, and soduim soaps, and that magnesium and calcium soaps promote the splitting of fat during its hydrogenation at relatively high temperature, causing an increase in the free fat acidity of the finished product. The magnesium and calcium soaps could be reduced to a minimum by washing the nickel and copper carbonate precipitates with soft water and by regeneration of dissolved catalyst with hydrogen peroxide and air. (*C.A.* **53**, 739)

VOLATILE COMPOUNDS FORMED BY DECOMPOSITION OF THE PEROXIDES OF HIGHLY UNSATURATED ACIDS AND THEIR METHYL ESTERS. Yoshiyuki Toyama, Katsuhito Suzuki, Takeshi Nakagami, and Keiho Yoshida. *Mem. Fac. Eng., Nagoya Univ.* **9**, 125–31 (1957). The highly unsaturated acids and their methyl esters prepared from sardine oil were oxidized by shaking in an atmosphere of air or oxygen, or spread on absorptive cotton and kept in contact with air, and then the oxidized samples were heated while a current of nitrogen was passed through to decompose the peroxides. The cycle was then repeated. The volatile compounds formed contained C_1–C_6 saturated acids, C_1–C_6 saturated aldehydes, crotonaldehyde and 2 hexenal, and possibly dialdehyde. The characteristic odor of the highly unsaturated acids of fish oil cannot be attributed to any of the compounds identified in this study. (*C.A.* **53**, 741)

APPLICATION OF THE CHROMATOGRAPHIC METHOD FOR THE ANALYSIS OF SYNTHETIC FATTY ACIDS. N. I. Ladyzhnikova. *Masloboino-Zhirovaya Prom.* **24**(9), 28–30 (1958). Adsorption of synthetic fatty acids from oxidized paraffin on a silica gel column, and the subsequent elution of the column with benzene, 95 and 90% benzene-alcohol mixtures, and alcohol alone, resulted in the fractionation of synthetic fatty acids and its separation from a mixture of a keto compound, unsaponifiable matter, and other low-molecular-weight monocarboxylic acids. (*C.A.* **53**, 1783)

DETERMINATION OF THE TOTAL AMOUNT OF THE PRODUCTS OF OXIDATION IN VEGETABLE OILS. V. P. Rzhekhin and N. I. Pogonkina. *Masloboino-Zhirovaya Prom.* **24**(10), 6–9 (1958). Fahrion's (*C.A.* **15**, 1225) method for the estimation of oxidized acids in vegetable oils was modified as follows: 5 g. of oil is saponified with 50 ml. of 2 *N* alcoholic potassium hydroxide solution for one hour. The alcohol is distilled off and the soap in the separatory funnel is treated with hot 10% solution of hydrochloric acid. After cooling, the mixture is extracted with 100 ml. of petroleum ether (boiling point 60°), and allowed to stand for 10–12 hours. The aqueous layer is decanted and the precipitated oxidized acids, which tends to concentrate in the interface, is filtered off, washed free of fatty acids with petroleum ether, dissolved in a small amount of hot alcohol, and filtered. The alcohol is then driven off, and the residual oxidized acids, dried at 100°, is weighed. 15 references. (*C.A.* **53**, 1785)

PAPER CHROMATOGRAPHY OF FATS. XXVI. THE QUANTITATIVE PAPER CHROMATOGRAPHIC-POLAROGRAPHIC ANALYSIS OF FATTY ACIDS. H. P. Kaufmann and M. M. Deshpande. *Fette, Seifen, Anstrichmittel* **60**, 537–41 (1958). A combination of paper-chromatographic and polarographic methods for the separation and determination of fatty acids is described. With 150–300 γ fatty acids in undecane at 22°, identification of the acids as copper salts by using cupric acetate, treatment at 60° with 0.1 *N* sulfuric acid to obtain soluble cupric sulfate, and by washing the excess with water, the acids are determined by polarographic estimations of copper. One- to 4-component known mixtures gave deviations of from −5.6 to −4.3%. Applied to natural oils, the fatty acids of corn oil contain, respectively, 49.1 and 50.8% oleic and linoleic acids, rape-seed oil contains linoleic 13.3, linolenic 12.1, oleic and palmitic 23.6, stearic 38.7, and erucic acid 38.6%. (*C.A.* **53**, 1783)

Detecting Lower Fatty Acids in Dough and Bread by Paper Chromatography. A. W. Croes (Meel en Brood T.N.O., Wageningen, Neth.). *Chem. Weekblad* **54**, 396–7 (1958). Leaven from wheat and rye flours contained formic acid, acetic acid, propionic acid, and butyric acid, but in normal dough propionic acid did not appear until after baking. Evidently all four acids are formed in normal bread-making processes. (*C.A.* **53**, 597)

Studies of Lard. I. Changes in Lard Through Treatment with Bleaching Earth. R. Grau and A. Mirna (Bundesforschungsanstalt Fleishwirtschaft, Kulmbach, Ger.). *Fleischwirtschaft* **10**, 694–7 (1958). The effect of refining on decrease in peroxide value depends on the type of earth used and temperature of bleaching. Decreases in peroxide value during refining are reflected as changes in the ultraviolet absorption spectra. The intensity of the triene band (E_{268}) depends on the initial quality of the bleached lard sample. (*C.A.* **53**, 1578)

The Detection of Lard Refining. R. Grau and A. Mirna. *Fette, Seifen, Anstrichmittel* **60**, 553–4 (1958). The ultraviolet spectra of the nonsaponifiable fractions of lard and tallow of satisfactory quality are essentially identical, while those of spoiled, deodorized, and bleached lard show maximum at 230 and 270 millimicrons; this indicates that spoilage brings about structural changes in the unsaponifiable fraction. (*C.A.* **53**, 1578)

By-Products from the Cracking of Castor Oil and Their Uses. G. Dupont (École normale superieur, Paris). *Olearia* **12**, 53–6 (1958). These by-products are found in the gases and in the two distillation fractions from the cracking process. The former consists mainly of carbon monoxide, carbon dioxide, and unsaturated hydrocarbons. One of the distillation fractions is the ''aldehyde head-oils'' collected before enanthaldehyde (heptyl aldehyde) comes off, and the other the ''S-oils'' from the residual material after methyl undecylinate is obtained. The main constituents of ''aldehyde head-oils'' are 20% enanthaldehyde, alkenes, hydrocarbons (mostly pentene, hexene, heptene, octene, nonene, and decene), and methyl esters of saturated acids. It can be used as an intermediate and as a gum and plastic solvent if deodorized by elimination of head products, by saponifying the fatty acids, or by hydrogenation. S-oils are methylated and found to consist of methyl undecylinate 8.0, ricinoleate 17.7, linoleate 38.7, palmitate 21.6, and unidentified acids 13.8%. These can be used in the manufacture of varnishes and plastics. (*C.A.* **53**, 1785)

Hardness of Butter. II. Influence of Setting. J. M. De Man and F. W. Wood (Department of Dairying, Univ. of Alberta, Edmonton, Canada). *J. Dairy Sci.* **42**, 56–61 (1959). The extent of setting was measured in conventional and continuously made butter representative of seasonal hardness extremes, which have been related earlier to variations in the solid fat content of the butterfat. The extent of setting, which is defined as the hardness increase during storage of the butter, is shown to be largely dependent on initial hardness, the harder butter displaying the greater degree of setting. Setting was always less, however, in continuously made butter when compared with conventional butter made in the same season. Rapid cooling of the cream resulted in a harder conventional butter, with an increase extent of setting. The extent of setting may be permanently lessened by printing and, again, the decrease is influenced by the initial butter hardness. A complete interruption of setting is effected by freezing, but setting resumes its normal course on removal of the butter to higher temperature storage.

Enzymatic Determination of Polyunsaturated Fatty Acids. J. MacGee (Procter and Gamble Co., Cincinnati). *Anal. Chem.* **31**, 298–302 (1959). A rapid enzymatic method is developed for determining polyunsaturated fatty acids using lipoxidase. The enzyme produces the conjugated diene hydroperoxide which is measured at 234 mμ. Direct measurements are made in fats, oils, fatty acids, blood plasma, microorganisms, and plant seed with good sensitivity and accuracy.

Formation of Methyl Ketones from Milk Fat During Steam Distillation or Saponification. S. Patton and B. W. Tharp (Pennsylvania Agricultural Experiment Station, University Park). *J. Dairy Sci.*, **42**, 49–55 (1959). An homologous series of methyl ketones was identified, by means of their 2,4-dinitrophenylhydrazones, in both the steam distillate and the unsaponifiable matter from milk fat. This series contains the n-alkyl members with odd numbers of carbons from C_3 (acetone) through C_{15} (pentadecanone-2). Evidence is presented that fresh unheated milk fat is devoid of such ketones, with the exception of acetone, but that it does contain carbonyl functions as suggested by its reaction with 2,4-dinitrophenylhydrazine reagent. The capacity of milk fat to generate methyl ketones is discussed in terms of origin and flavor significance.

Composition of Edible Fats, Unsaturated Fatty Acids of Butterfat. W. E. Scott, S. F. Herb, P. Magidman, and R. W. Riemenschneider (Eastern Utilization Res. and Development Division, U.S. Department of Agriculture, Philadelphia 18, Pa.). *J. Agr. and Food Chem.* **7**, 125–28 (1959). This study was undertaken to characterize more completely the unsaturated fatty acids of butterfat. The presence of C_{10} to C_{18} monoethenoid acids was confirmed; the C_{12} and C_{14} were predominantly the *cis*-form, while C_{16} and C_{18} acids and both *cis* and *trans* double bonds. The nonconjugated dienoic acids were found to be a mixture of *cis-cis* and either *cis-trans* or *trans-trans* isomers. Conjugated dienoic acids were identified as *cis-trans* and *trans-trans* isomers. The trienoic, tetraenoic, and pentaenoic acids had the all-*cis* configuration.

Analysis of Long-Chain Fatty Acids by Gas-Liquid Chromatography. Micromethod for Preparation of Methyl Esters. W. Stoeffel, Florence Chu, and E. H. Ahrens, Jr. (Rockefeller Inst., New York 21). *Anal. Chem.* **31**, 307–08 (1959). A technique is devised for the quantitative formation of methyl esters of long-chain fatty acids. The esters, separated in pure form by sublimation, are ready for gas-liquid chromatographic studies. The technique eliminates saponification with its several disadvantages.

Vegetable Oils and Fats. IV. Takejii Kashimoto (Kanazawa Univ.). *Nippon Kagaku Zassi* (J. Chem. Soc. Japan, Pure Chem. Sect.) **78**, 123–5 (1957). The plant studied, the oil yield (%) of the seed (or the fruit), $d^{4/30}$, $n^{D/25}$, acid no., saponification no., iodine no., unsaponifiable matter content (%), and fatty acids identified, were, respectively, as follows: *Oenanthera parviflora*, 19.74, 0.9190, 1.4760, 1.256, 203.0, 91.79, 2.88, myristic (I), palmitic (II), stearic (III), oleic (IV), and linoleic (V); *Sophora angustifolia*, 12.14, 0.9217, 1.4773, 2.113, 209.2, 110.7, 3.04, I–V, and arachidic (VI); *Vitex rotundifolia*, 8.00% of the fruit, 0.9248, 1.4795, 3.271, 197.1, 124.4, 10.82, II–VI, and montanic (VII); *Cassia mimosoides* var. *nomame*, 4.48, 0.9281, 1.4771, 3.818, 203.0, 127.6, 2.58, I–VI, and linolenic (VIII); *Polygonum tinctorum*, 3.68, 0.9147, 1.4745, 5.060, 199.0, 109.8, 2.46, I, II, IV–VI, and VIII; *Artemisia capillaris*, 11.20, 0.9088 (at 45°), 1.4797, 4.535, 179.7, 128.5, 16.56, II–VII.

Vegetable Oils and Fats. V. *Ibid.* **79**, 403–6 (1958).; cf. preceding abstr. The similar data were as follows: *Ternstroemia japonica*, 43.29, 0.9166 (at 20°), 1.4650, 1.23, 156.6, 97.97, 3.60, I-III, V, and petroselinic (IX); *Ligustrum japonicum*, 11.50% of the fruit, 0.9378, 1.4753, 10.96, 139.6, 95.13, 2.96, I–VI, and cerotic (X); *Achyranthes japonica*, 8.84% of the fruit, 0.9187, 1.4698, 1.29, 151.4, 126.3, 2.90, I–VII, and X; *Gilbertia trifida*, 35.21, 0.9137, 1.4644, 3.97, 163.9, 89.52, 2.36, only V and IX; *Arabis japonica*, 18.50, 0.9315, 1.4732, 1.65, 141.8, 169.8, 2.70, I–III, V–VIII, and X.

Vegetable Oils and Fats. VI. Takeji Kashimoto and Kunio Noda. *Ibid.* **79**, 873–6 (1958); cf. preceding abstr. The similar data were as follows: *Rosa multiflora*, 14.00, 0.9241, 1.4787 (at 14°), 2.54, 185.4, 156.3, 3.20, I–VI, and VIII; *Solanum melongena* var. *esculentum*, 19.83, 0.9232, 1.4754 (at 14°), 5.65, 180.3, 126.2, 3.84, I–VI; *Chrysanthemum coronarium* var. *spationum*, 17.75% of the fruit, 0.9223, 1.4766 (at 14°), 5.72, 184.5, 139.7, 5.10, I–VI, and X; *Mallotus japonicus*, 45.83, 0.9354 (at 40°), 1.4897 (at 37°), 42.10, 194.8, 114.8, 3.70, I, II, V, and IX; *Clerodendron trichotumum*, 34.25% of the fruit, 0.9055 (at 35°), 1.4666 (at 27°), 2.53, 173.4, 113.3, 4.77, I–VII, and X.

Fatty Oils of Aquatic Invertebrates. XVI. Fatty Oils of Cynthia Roretzi and Pinna Pectinata Japonica with Particular Reference to Their Sterol Components. Toru Takagi, Takeo Maeda, and Yoshiyuki Toyama (Nagoya Univ.). *Nippon Kagaku Zassi* (J. Chem. Soc. Japan, Pure Chem. Sect.) **78**, 88–92 (1957). Two samples of *C. roretzi* flesh (containing viscera) gave 11.0, 7.5% of ether extract and 9.3, 5.7% acetone soluble portion. The latter, i.e. oil gave the following data: $d^{4/30}$ 0.9414, 0.9512, $n^{D/30}$ 1.4820, 1.4879, acid no. 39.7, 41.9, saponification no. 152.2, 154.5, iodine no. 179.9, 194.7, unsaponifiable matter (%) 15.57, 15.60, solid acids (%) 20.4, 21.2, iodine no. of solid acids 10.6, 12.4, unsaturated fatty acids—dienoic 3.7, 6.0, trienoic 2.4, 1.6, tetraenoic 6.6, 10.9, pentaenoic 26.5, 16.3, and hexaenoic 14.7, 14.7%. The sterols were examined by chromatography of the acetates on Al_2O_3 column, ultraviolet and infrared absorption, and chemical studies. They were $\Delta^{5,7}$-conjugated sterol (possibly 7-dehydrostigmasterol), poriferasterol, and clionasterol. The viscera oil of *P. pectinate japonica* had $d^{4/30}$ 0.9226, $n^{D/30}$ 1.4720, acid no. 76.5, saponification no. 146.2, iodine no. 171.1, and unsaponifiable matter (%) 19.98. A $\Delta^{5,7}$-conjugated sterol (m.p. 122–3°) and clionasterol were identified.

XVII. Fatty Oils from One Species of Ophiuroidea, Three Species of Asteroidea, and Three Species of Loricata with Particular Reference to Their Sterol Components. Toru Takagi and Yoshiyuki Toyama. *Ibid.* 93–6. Species from which oil was extracted, $n^{D/30}$, acid no., saponification no., iodine no., and unsaponifiable matter (%), were as follows: *Gorgonocephalus caryi (Ophiuroidea)* (2 samples), 1.4824 and 1.4839, 107.1 and 116.4, 147.7 and 143.4, 156.4 and 183.3, 25.46 and 29.86; *Luidia quinaria*, 1.4757, 124.9, 146.8, 136.0, 25.94; *Astiopecten scoparius*, 1.4697, 137.0, 147.3, 152.0, 26.52 (these 3 belong to *Asteroidea*); *Acanthochiton rubrolineatus*, 1.4777, 35.0, 144.1, 130.2, 22.52; *Cryptoplax japonica*, —, —, —, —, 18.80; *Liolophura japonica*, 1.4782, 43.9, 151.1, 136.7, 23.89 (these 3 belong to *Loricata*). The sterols of *G. caryl* consisted mainly of Δ^5-sterols, among which β-sitosterol was present. Other species contained Δ^7-sterols (about 40% of unsaponifiable matter). In this case $\Delta^{5,7}$-conjugated sterols were scarce, if any were present. The fatty acids of *Liolophura japonica* oil contained 27.4% solid acids (iodine no. 12.7), dienoic 9.5, trienoic 7.0, tetraenoic 9.1, pentaenoic 5.8, and hexaenoic 2.2%.

XVIII. Fatty Oil of Tonna Luteostoma and Its $\Delta^{5,7}$-Sterol Component. Tatsuo Tanaka and Yoshiyuki Toyama. *Ibid.*, 665–8. The flesh and viscera (2 samples) of this shellfish had, respectively, $d^{4/40}$-, 0.9129, 0.9128, $n^{D/40}$-, 1.4707, 1.4721; acid no. 57.7, 19.0, 84.0; saponification no. 124.4, 163.1, 163.8; iodine no. 135.9, 133.1, 141.0; unsaponifiable matter (%) 50.21, 15.30, 14.72. The viscera oil contained solid acids 29.2%, dienoic 5.9, trienoic 11.0, tetraenoic 9.7, pentaenoic 5.4, and hexaenoic 3.0%. The viscera oil contained a $\Delta^{5,7,22,25}$-cholestatetraenol, as examined by Al_2O_3 column chromatography, ultraviolet and infrared absorption, and derivatives.

XIX. Nonconjugated Sterols and Other Unsaponifiable Components in the Fatty Oil from Tonna Luteostoma. *Ibid.*, 366–70. The non-conjugated sterols of flesh and viscera oils from this shellfish consisted chiefly of the sterols with one double bond, which were cholesterol and clionasterol (γ-sitosterol). The viscera oil contained bachyl and selachyl alcohols. Also in *Mem. Fac. Engineering, Nagoya Univ.* **10,** 77–83 (1958) (in English).

XX. Fatty Oil from a Shellfish, Brachidontes Senhousia with Particular Reference to Its Sterol Components. Toru Takagi and Yoshiyuki Toyama. *Ibid.*, 1236–9. Three samples of this oil showed acid no 72.8–85.1, saponification no. 145.2 164.3, iodine no. 150.1–152.9, unsaponifiable matter (%) 20 4 31.0, sterols in the unsaponifiable matter 34.9–40.3%, $\Delta^{5,7}$-conjugated sterol in total sterols 30.5–34.7%. Studies by Al_2O_3 column chromatography, ultraviolet and infrared absorption, and derivatives showed that this sterol was $\Delta^{5,7,22}$- (or $\Delta^{5,7,23}$-) cholestratrienol.

A Symposium on Oxidation [of Oils] and Its Prevention. Introduction. Tsutomu Kuwata. *Yukagaku* (J. Japan Oil Chemists' Soc.) **7,** 247 (1958).

Reaction Mechanism of Autoxidation and Bond Energies. Makoto Takashi. *Ibid.*, 248–56.

Oxidation Stability of Fuel Oils. Yuzo Koga. *Ibid.* 257–63.

Some Problems in Oxidation Stability Tests of Lubricating Oils. Akira Wakana. *Ibid.* 263–75.

Oxidation of Edible Fats and Its Evaluation. Shinji Mitsunaga and Umajiro Shimamura. *Ibid.* 275–84.

Oxidation and Flavor Problems in Edible Oils. Kazuhiko Yoshitomi. *Ibid.* 285–93.

Edible Oils. Mitsuo Nakamura and Sakan Tomita. *Ibid.* 293–8.

Stability of Fatty Acids. Izumi Yamane. *Ibid.* 298–302.

Oxidation of Shortening and Margarine. Hisato Murata. *Ibid.* 302–8.

Vitamins and Antioxidants. Goichiro Katsui. *Ibid.* 308–12.

Rancidity of Soap. Masao Nonaka. *Ibid.* 312–14.

Perfumery. Shigeo Katsura. *Ibid.* 315–17.

Rusting of Fish Products and Its Prevention. Junsaku Nonaka. *Ibid.* 317–22.

The Oxidation of Foods and Its Prevention. Yoshijiro Kihara. *Ibid.* 322–5. Reviews with references.

Naturally Occurring Sterols. Correction and Supplement. Taro Matsumoto. *Yukagaku* (J. Japan Oil Chemists' Soc.) **7,** 518 (1958); cf. *Ibid.* 61–9.

A Review of Japanese Studies on Oil Chemistry in 1955–57. Saburo Komori. *Yukagaku* (J. Japan Oil Chemists' Soc.) **7,** 225–31, 363–75 (1958). A review with 378 references.

A Symposium on Rheology. Introduction. Tsutoma Kuwata. *Yukagaku* (J. Japan Oil Chemists' Soc.) **7,** 455 (1958).

Rheological Problems in Oil Chemistry. Hirotaro Kambe. *Ibid.* 461–5.

Rheology of Paints and Varnishes. Masao Gotoda. *Ibid.* 489–500.

Rheological Aspect of Margarine and Shortening. Akira Enomoto, Jun Kawai, and Shinji Mitsunaga. *Ibid.* 511–18. Reviews with references.

Separation of Glycerylphosphoryl Inositol and Related Compounds on Ion-Exchange Columns. J. N. Hawthorne and G. Hübscher. (Dept. Med. Biochem. & Pharmacol., The Medical School, Birmingham 15). *Biochem. J.* **71,** 195–200 (1959). A procedure for the alkaline hydrolysis of phosphatides is described. Hydrolyzates were fractionated on columns of Nalcite SAR or Dowex 1 or 2. On these columns, glycerylphosphoryl inositol and glycerylphosphoryl serine were separated from one another and from other phosphates, and glycerylphosphoryl choline was not retained. It is suggested that the glycerophosphate observed in hydrolyzates of tissue phospholipids cannot arise from any known lipid except phosphatidic acid. Evidence is presented indicating that the glycerylphosphoryl inositol from liver has a structure analogous to that of lecithin, choline being replaced by myoinositol.

Method of Treating Peaches. R. D. Gerwe and M. A. Slade, Jr. (Food Machinery & Chemical Corp.). *U.S. 2,866,709.* Freshness of peaches is preserved by coating them with a highly atomized spray of wax dissolved in a refined vegetable oil.

Coated Sausage Casing. L. E. Dowd and M. A. Glaser (Tee-Pak, Inc.). *U. S. 2,866,710.* A sausage casing is made from a regenerated cellulose film coated with a mixture containing a butadiene-styrene copolymer as a moisture proofing ingredient and the reaction product of (A) a polyhydric phenol and a member of the group consisting of polyhaloalcohols, epihalohydrins and polyepoxy compounds, and (B) a drying oil, drying oil fatty acids or mixtures of these.

Recovery of Beta-Sitosterol from Tall Oil Pitch by Steam Distillation. L. F. Ciesielski and H. Albrecht (American Cyanamid Co.). *U. S. 2,866,739.* A mixture of beta-sitosterol and C_{22} to C_{26} alcohols is fractionated by steam distillation at temperatures of 190–280°.

Separating Non-Acids from Soap Stocks. R. R. Chase and J. C. Bowers (Union Bag-Camp Paper Corp.). *U.S. 2,866,781.* Sterols, higher alcohols and other nonsaponifiable materials are separated from crude tall oil soap skimmings and cottonseed foots by extraction of their aqueous dispersion with a low molecular weight ester.

Improved Process of Isolating Sterols. C. M. Berry, R. W. H. Chang, N. M. LeBard, and S. E. Miller (General Mills, Inc.). *U.S. 2,866,797.* Sterols are precipitated from their solution in ethylene dichloride by the addition of 0.2 to 2% of water and 2 to 5% of methanol.

Deep Fat Frier. D. M. Lutze (J. C. Pitman & Sons, Inc.). *U. S. 2,867,164.*

Process for Stabilizing and Refining Tung Oil. J. A. Watts (Tungolin Co., Inc.). *U.S. 2,867,639.* Tung oil is decolorized and deodorized without a substantial increase in viscosity by heating at 170 to 190°F. in the presence of about 5% of a solid adsorbent. The adsorbent is removed. At least 20% of the treated oil is further heated at 475 to 500°F. for no longer than 15 min. and is then added to the bulk of the adsorbent-treated oil. The resultant product is stable against formation of glyceryl-β-elaeostearate.

Liquid Shortening. F. H. Brock (A. E. Staley Mfg. Co.). *U.S. 2,868,652.* A liquid shortening having a creamy consistency at room temperature is prepared from an edible triglyceride oil containing substantially no normally solid triglycerides, a minor amount of mono- and diglycerides of fatty acids containing at least 16 carbon atoms and not more than one double bond, and a small amount of a free fatty acid containing at least 16 carbon atoms and not more than one double bond.

Salad and Dessert Topping. H. W. Diamond and E. L. Powell (R. A. Rich). *U.S. 2,868,653.* An edible, whippable emulsion is prepared from water, a glyceride fat, an alkyl cellulose derivative, and a polyol-fatty acid ester surfactant.

Preparation of Stigmasterol Material. M. H. Stern and O. D. Hawks (Eastman Kodak Co.). *U.S. 2,870,176.* A process is described for the recrystallization of phytosterol mixtures to enhance the stigmasterol concentration.

Edible Oil Containers and Method of Treating. G. W. Holman (The Procter & Gamble Co.). *U. S. 2,871,130.* Threads on a container for edible oils are coated with a film of an alkali metal dihydrogen orthophosphate salt.

Rearrangement of Lard with Metal Alcoholates. L. A. Van Akkeren (Swift & Co.). *U. S. 2,872,463.* Rearrangement of lard by heating under reduced pressure is catalyzed by an alkali metal glycerate and a low molecular weight glyceride.

Method of Processing Soybean Oil to Retard Flavor Reversion. R. J. Sims, K. F. Mattil, and W. J. Lehman (Swift & Co.). *U.S. 2,872,465.* Flavor reversion in unhydrogenated soybean oil is inhibited by heating the oil at 70° to 160°F. in the presence of 0.01 to 0.5% by wt. of a mild oxidizing agent such as dilute nitric acid, potassium dichromate or potassium permanganate.

Frying Oils. D. Melnick and C. M. Gooding (The Best Foods, Inc.). *U.S. 2,874,055.* A novel frying oil consists of a deodorized, hydrogenated vegetable seed oil having an iodine value of 75 to 94, a melting point of 80° to 95°F., and a setting point of 55° to 65°F.

Margarine Oil Composition. E. F. Drew. *U.S. 2,874,056.* A fat is produced by the interesterification of a coconut type oil with 1 to 20% of lower fatty acid glycerides from coconut oil, followed by physical mixing of the product with 1 to 15% of triglycerides of the palmitic acid fraction from coconut oil. The resultant fat has a Wiley melting point of 95 to 100°F. and a setting point of 20 to 23°.

Carotenoid Preparations. H. Klaui and H. Moor (Hoffmann-LaRoche Inc.). *U.S. 2,874,058.* A solid carotenoid concentrate is prepared by dissolving at least 15% by wt. of carotenoid in cetylic alcohol.

Recovery of Ergosterol. H. A. Nelson (The Upjohn Co.). *U.S. 2,874,171.* A process is described for the hydrolysis of yeast with an alkali metal hydroxide and a partially water miscible alkanol by heating. Ergosterol is recovered from the alkanol solution.

Interesterification Processes. Unilever Ltd. *Brit. 796,808.* Spray drying 20% $NaOCH_3$ in ethyl alcohol by means of a rotating spray disk having a fluted surface and serrated rim gave a powdered, solid catalyst, 10–50 millimicrons in size, suitable for the interesterification of a mixture of cottonseed oil 20, coconut oil 40, hardened palm oil 10, and hardened whale oil 30% at 120°. (*C.A.* **53**, 1788)

Treatment of Glyceryl Esters. Ethyl Corp. *Brit. 797,357.* A fatty acid containing 5-40 carbon atoms in the fatty acid radical and glycerol is produced by reaction of a glyceryl ester with an aliphatic, cycloaliphatic, or araliphatic monohydric alcohol in the presence of an alkaline alcoholysis catalyst and an inert hydrocarbon solvent. The solvent used makes the glycerol insoluble or slightly soluble enough to form two layers; a glycerol layer, and a fatty acid ester and solvent layer. The glycerol layer is then separated. Further amounts of glycerol can be recovered by treating the ester phase with water. In this process, the ester layer is treated with an alkali metal to form an alcohol. In another aspect of the invention, the glycerol ester is allowed to react with 1.5–3 equivalents of a C_2–C_{10} aliphatic monohydric alcohol in the presence of an alcoholysis catalyst (an alkali metal alcoholate) and 0.2–1 part by weight of an inert hydrocarbon solvent per part of glyceryl ester treated. (*C.A.* **53**, 1788)

Viscometer, Especially for Vegetable and Animal Oils. Elly Höppler and Asta A. Schlaubitz. *Ger. 950,506.* (*C.A.* **53**, 744)

Extraction of Oil-Containing Materials. H. Gehle, H. Cleve, and R. Kempe (MIAG Vertriebsgesellschaft m.b.H.). *Ger. 951,031.* The process concerns solvent extraction, in which the material to be extracted is moistened first with the miscella which are added for filtering. After leaving the bath, the material is sprayed with pure solvent. An apparatus is described for the multiphase process. (*C.A.* **53**, 744)

Bleaching of Waxes, Fatty Oils, and Fats. R. Schirmer, H. Voit, and H. Hoyer (Farbwerke Hoechst Akt.-Ges., Werk Techchemie). *Ger. 954,903.* Bleaching is accomplished with chromium trioxide and sulfuric acid. The process is separated into several stages. The apparatus is described. (*C.A.* **53**, 743)

Apparatus for Continuous Solvent Extraction of Oily Materials. A. Falke (Christiansen und Meyer). *Ger. 955,627.* (*C.A.* **53**, 744)

Automatic Filtration Apparatus for Extraction of Vegetable Oil. E. Castellanos (Macquinaria Española Oleicola Maeso S. L.). *Ger. 956,538.* (*C.A.* **53**, 744)

Saponins from Horse Chestnuts. H. Schinske. *Ger. (East) 11,046.* (*C.A.* **53**, 744)

Crystalline Saponins from Horse Chestnuts. J. Merkel. *Ger (East) 11,178.* (*C.A.* **53**, 744)

Water-Soluble Prosapogenin from Horse Chestnuts. J. Merkel. *Ger. (East) 11,942.* (*C.A.* **53**, 744)

Separation of Fatty Acids and Alcohols from Lanolin. Società per la Distillazione Molecolare Società per Azioni (Sodimo). *Ital. 528,835.* Wool, carnaubyl, and hexadecyl alcohols, cholesterols, and palmitic and stearic acids are separated from lanolin by molecular distillation, after the raw product has been saponified. (*C.A.* **53**, 1788)

Deacidification of Vegetable Oils. Adolfo Romeo. *Ital. 531,502.* Vegetable oils containing up to 4% acids are deacidified without injury to their organoleptic characteristics by freezing and separating the liquid parts by centrifugation or pressure. (*C.A.* **53**, 1788)

Continuous Deodorization of Oils and Fats. Fratelli Gianazza Società in accomandita semplice. *Ital. 550,404.* A design of a plant. (*C.A.* **53**, 1584)

Oryzanol. T. Tsuchiya and O. Okubo (Bureau of Industrial Technics.). *Japan. 1149('58).* A residue (100 parts) after distillation of rice-oil hydrolyzate and containing 20% oryzanol is saponified with 100 parts 12% potassium hydroxide, 400 parts methyl alcohol added, and kept overnight at 18°. The precipitate is filtered off and the filtrate neutralized with acetic acid. The precipitate is filtered off and the filtrate acidified with acetic acid and let stand at room temperature, yielding 14 parts oryzanol, $E^{1\%/1cm.}$ 348 at 315 millimicrons. (*C.A.* **53**, 744)

Preserving Animal Fats. N. M. Emanuel, D. G. Knorre, Yu. M. Lyaskovskaya, A. A. Ivanova, and V. I. Piul'skaya. *U.S.S.R. 109,997.* Rendered animal fats are preserved with an alkaline salt., e.g., 0.08% of sodium carbonate or 0.2% of ascorbyl palmitate, to prevent the formation of mildew. (*C.A.* **53**, 1584)

FATTY ACID DERIVATIVES

Preparation of Unsaturated Fatty Alcohols by High Pressure. J. M. Martínez Moreno, R. Establier Torregrosa, and A. Vázquez Roncero (Univ. Seville). *Grasas y aceites* (Seville, Spain) 9, 60–3 (1958). Unsaturated alcohols are prepared in 92% yield from oleic acid, sulfur olive oil, or the fatty acids from olive oil by treating with hydrogen at 265° under 200 atmospheres for 2–3 hours, using 10% copper chromite as catalyst and 3.75% cadmium carbonate to protect the double bonds. (*C.A.* **53**, 1104)

Treatment of Polyunsaturated Fatty Acids. W. S. Baldwin, D. E. Floyd and R. F. Paschke (General Mills, Inc.). *U.S. 2,868,815.* A process of aromatizing linoleic acid compounds consists in heating linoleic acid or its esters to about 270° in the presence of a noble metal active hydrogen transfer catalyst. The products contain aromatic ortho-substituted dialkyl monocarboxylic acids which are characterized by a strong infrared absorption band in the 13.3μ region.

Hydrogen of Phosphatides. G. Jacini (American Lecithin Co., Inc.). *U.S.2,870,179.* Phosphatides are hydrogenated at 75 to 80° at 50 to 150 atm. in the presence of finely powdered nickel and platinum as a catalyst.

Method of Making Bakery Products. N. H. Kuhrt and M. I. Van Graafeiland (Eastman Kodak Co.). *U.S. 2,871,124.* In the preparation of bakery products, there is incorporated into the mix prior to baking 0.1 to 3.0% by wt. of a monoglyceride composition containing 50 to 95% of higher triglycerides and 5 to 50% of purified, saturated fatty acid monoglycerides. The preferred monoglycerides are monopalmitin and monostearin at least 25% of which are dispersed in the form of microcrystals about 0.05 to 0.2 micron in diameter and 1 to 20 microns in length. *U.S. 2,871,125.* The preferred monoglyceride is monopalmitin. *U.S. 2,871,128.* The preferred monoglyceride is monostearin.

Crystallization of Sugars. S. E. Kent (Hodag Chemical Corp.). *U.S. 2,871,148.* Sugars are crystallized in the presence of a C_8 to C_{22} fatty acid ester of a glycoside.

Fatty Acid Screen Vehicles. W. C. Morris. *U.S. 2,872,326.* A homogeneous vehicle for suspending a vitrifiable ceramic composition is prepared from 0.5 to about 55% by wt. of azelaic acid and at least 35% of C_{12} to C_{22} fatty acids.

Bifidogenic Compositions. J. Keck (Dr. Karl Thomae G.m.b.H.). *U.S. 2,872,382.* A bifidogenic composition is prepared from a glycero-phosphatide and cystine or cysteine.

Linoleum Composition. L. H. Dunlap and J. A. Parker (Armstrong Cork Co.). *U.S. 2,873,201.* The filler binding composition in linoleum is prepared by reacting dilinoleic acid with pentaerythritol by heating.

Alkyl Esters of Alkoxy-Acyloxy Stearic Acid. L. E. Gast, J. C. Cowan and H. M. Teeter (U.S.A., Secy. Agr.). *U.S. 2,873,255.* The preparation of alkyl ester of alkoxy-acyloxy stearic acid is described. Products are suitable for use in lubricants.

Process for Making Fatty Acid Diglyceride Diesters of Dibasic Acids. R. O. Feuge and T. L. Ward (U.S.A. Secy. Agr.). *U.S. 2,874,175.* Glycerol is esterified with a C_{12} to C_{22} fatty acid in such a way that the predominant product is the diglyceride. This is esterified with C_4 to C_{10} aliphatic dicarboxylic acid so as to form a diglyceride diester.

Epoxy Fatty Acid Esters. Union Carbide Corp. *Brit. 788,530.* Alkenyl esters of monoethylenic fatty acids were epoxidized with peracetic acid. (*C.A.* **53**, 1151)

Higher Aliphatic Alcohols. Société belge de l'azote et des produits chimiques du Marly, S.A. *Brit. 795,573.* A continuous process is described for the preparation of higher fatty alcohols from vegetable and animal fats. The fatty materials are first catalytically treated under super-atmosphere pressure (about 100 atmospheres) and at elevated temperature (300–360°) with a monohydroxy alcohol, such as methyl alcohol. Glycerol separates from the fats which are transformed into the corresponding esters. These are, in turn, catalytically converted by excess hydrogen at about 400 atmospheres and 180–250° into higher fatty alcohols. The unreacted hydrogen and the freed monohydroxy alcohol are recycled. In the various stages of the process, a powdered zinc silicate catalyst is used for transesterification, a copper zinc chromite catalyst for hydrogenation of the carboxylic ester group, and a nickel silicate catalyst for saturation of the olefinic linkages. (*C.A.* **53**, 743).

• Biology and Nutrition

Essential Fatty Acid Deficiency—Its Role in Parakeratosis. L. J. Hanson, D. K. Sorensen, and H. C. H. Kernkamp (Univ. of Minnesota, St. Paul). *Am. J. Vet. Research* **19**, 921–30 (1958). In two laboratory trials, parakeratosis was produced in normal, healthy, weaned feeder pigs. A deficiency of essential fatty acid was created by excessive levels of growth stimulants in a well-balanced swine ration. (*C.A.* **53**, 526)

Metabolisms of Sugars, Lipides, and Proteins. Tatsuo Abe (Tôhô Univ., Tokyo). *Yakkyoku* **8**, 553–6 (1957). A review. (*C.A.* **53**, 535)

Effect of Certain Dietary Oils on Bile-Acid Secretion and Serum Cholesterol. B. Lewis and Enid Volks (Univ. Cape Town, S. Africa). *Lancet* **1958-I**, 1090–2. Bile acid excretion was studied during the administration of various types of fat to three patients with complete bile fistulas. Sunflower-seed oil given by mouth and cottonseed oil given intravenously greatly increased the rate of cholic acid secretion, which preceded a fall in serum cholesterol. Hydrogenated coconut oil did not affect the bile acid output but raised the serum cholesterol. The findings support the hypothesis that the mechanism by which the serum cholesterol is reduced by certain vegetable oils involves accelerated catabolism of cholesterol to cholic acid. (*C.A.* **53**, 520)

Serum Cholesterol Levels after Consuming Eggs with Increased Content of Unsaturatd Lipides. H. Gordon, J. Wilkens, and J. F. Brock (Univ. Capetown, Union S. Africa). *Lancet* **1958-II**, 244-5. Ordinary and unsaturated hen's eggs were fed to adult Bantus. The unsaturated eggs had been laid by hens fed a mixture containing 43% sunflower seed (80% dehulled). The iodine number of their yolk lipides was 100 in comparison with 73 in control eggs. Serum cholesterol levels of subjects fed 10 boiled unsaturated egg yolks daily rose from 188 mg./100 ml. on a basal diet very low in fat to 218 mg. Next the basal diet plus 3 g. cholesterol (i.e., the amount in 10 egg yolks) was fed and serum cholesterol returned to basal level. In another experiment a minor effect was produced by feeding unsaturated eggs. Failure of the unsaturated eggs to lower serum cholesterol levels could be due to the presence in the yolk of an isomer of the biologically active *cis-cis* form of linoleic acid. The effect of dietary fats on serum cholesterol level is not simply a function of their degree of saturation. (*C.A.* **53**, 1484)

Serum Cholesterol Levels in Atherosclerotic Subjects and in the Australian Aborigenes. C. J. Schwartz and J. R. Casley-Smith (Univ. Adelaide). *Med. J. Australia* **1958-II**, 84–6. The mean serum cholesterol level of members of the Pintubi tribe was significantly lower than the mean level for controls of European descent. This difference was related to differences in dietary fat intake. Serum cholesterol levels were not elevated in a series of atherosclerotic patients in this study. (*C.A.* **53**, 535)

Serum Lipide Fractions and Serum Turbidity in High-Fat Diets upon Lipase Administration. H. Redetzki (St. Georg Hosp., Hamburg, Ger.). *Verhandl. deut. Ges. Verdaunngs-u. Stoffwechselkrankh. 18. Tagung Bad Hamburg* **1955**, 273–5 (Pub. 1957). High-fat diets supplemented with olive oil were used to study the effect of a pancreatic lipase preparation. Lipase apparently slowed the absorption of fat. Decrease in serum turbidity after pancreatic lipase was administered, in spite of increased total lipides, indicated little increase in chylomicra. (*C.A.* **53**, 536)

Essential Fatty Acid Deficiency. III. Effects of Conjugated Isomers of Dienoic and Trienoic Fatty Acids in Rats. E. Aaes-Jorgensen (The Hormel Inst. and Department of Physiological Chemistry, Univ. of Minnesota, Austin). *J. Nutrition* **66**, 465–83 (1958). Weanling male rats were fed a semi-synthetic, fat-free diet with or without supplements. The supplements, replacing 5% of sucrose, were: (a) 1% of conjugated *cis, trans*-ethyl linoleate plus 4% of ethyl palmitate; (b) 1% of conjugated *trans, trans*-ethyl linoleate plus 4% of ethyl palmitate; (c) 1% of ethyl α-eleostearate plus 4% of ethyl palmitate; (d) 1% of ethyl β-eleostearate plus 4% of ethyl palmitate; (e) 5% of ethyl palmitate; (f) 5% of cottonseed oil; and (g) 5% of hydrogenated coconut oil; (h) 1% of ethyl linoleate plus 4% of ethyl palmitate. It is concluded that the presence of small amounts of conjugated polyenoic acid does not explain the dietary effects of hydrogenated fat upon rats. The polyenoic acid pattern of adipose tissue differed markedly from that of other tissues examined.

Essential Fatty Acids in Infant Nutrition. II. Effect of Linoleic Acid on Caloric Intake. Doris J. D. Adam, A. E. Hansen and Hilda F. Wiese (Department of Pediatrics, Univ. of Texas School of Medicine, Galveston). *J. Nutrition* **66**, 555–64 (1958). The caloric intake was measured on 18 healthy infants under 4 months of age who, for one to 28 weeks, were fed on one or several of 12 different types of milk. The linoleic acid intake ranged from 0.1% to 8.0% of total calories. On the basis of the data presented it appears that in young infants optimum caloric efficiency is attained when linoleic acid comprises about 4% of the caloric intake.

Studies on the Experimental Production and Prevention of Bloat in Cattle. III. The Effect of Vegetable Oil and Animal Fat on Acute Legume Bloat. H. W. Colvin, Jr., J. M. Boda and T. Wegner (Dept. of Animal Husbandry, Univ. of California, Davis). *J. Dairy Sci.* **42**, 333–45 (1959). The influence of animal and vegetable fats on ruminal motility, eructation, and bloat has been investigated in dairy cattle receiving freshly harvested alfalfa tops under laboratory and feed-lot conditions. It is concluded that foaming of the rumen ingesta is an important factor in the etiology of acute legume bloat. Rumen motility studies indicate that there is a sufficient number of secondary (eructation) contractions occurring during the development of bloat to relieve the pressure, if the cardia can be cleared of foam. Animal and vegetable fats prevent acute legume bloat by exerting such an effect.

The Biosynthesis of Ergosterol: Its Relationship to the Squalene Hypothesis. W. G. Dauben, T. W. Hutton and G. A. Boswell (Department of Chemistry, Univ. of California). *J. Am. Chem. Soc.* **81**, 403–07 (1959). C^{14}-Ergosterol was biosynthesized from 1-C^{14}-acetate and the distribution of the labeled atoms studied. By conversion of ergosterol to progesterone it was shown that the distribution of label between the side-chain and the nucleus was that predicted on the basis of the squalene hypothesis. The specific carbons, C-3, C-4, C-11, and C-12 were obtained by degradation of appropriate precursors, and it was found that C-4, C-11 and C-12 were derived from the carboxyl of acetate, again as predicted by the squalene hypothesis. These results strongly support the concept of the utilization of the intact acyclic triterpene, squalene, in the biosynthesis of all steroids.

Protein Distribution in Fresh and Stored Shell Eggs from Hens Fed Crude Cottonseed Oil. R. J. Evans, Selma L. Bandmer, J. A. Davidson and Doris H. Bauer (Michigan State Univ. of Agriculture and Applied Science, East Lansing). *J. Agr. and Food Chem.* 7, 47–50 (1959). Hens fed rations containing 2.5% crude cottonseed oil produce eggs that develop pink whites and large salmon-colored yolks after 6 months or more of cold storage. Protein migrates from the white to the yolk. The composition of the migrating protein was calculated from changes in protein distribution in whites and yolks of fresh and stored shell eggs as determined by paper electrophoresis. The migrating protein contained ovalbumin, conalbumin, and lysozyme, but no ovumucoid or ovoglobulin. Livetin migrated from yolk to white. The lipovitellenin band from 6-month-old eggs moved almost three times as far as that from fresh eggs during electrophoresis. Part of the lipovitellin was converted to a protein which behaved similarly to lipovitellenin under the conditions used for electrophoresis.

Essential Fatty Acids in Infant Nutrition. III. Clinical Manifestations of Linoleic Acid Deficiency. A. E. Hansen, Mary E. Haggard, A. N. Boelsche, Doris J. D. Adam and Hilda F. Wiese (Department of Pediatrics, Univ. of Texas School of Medicine, Galveston). *J. Nutrition* 66, 565–76 (1958). In an infant feeding study it was found that young infants fed on a skim milk diet extremely low in fat and linoleic acid, though otherwise nutritionally adequate, showed certain signs and symptoms. The first sign observed was dryness, then thickening and later desquamation with oozing in the intertriginous folds. Addition of saturated fatty acids to the diet did not improve the skin. On the other hand, the addition of linoleic acid as trilinolein to constitute 2% of the daily caloric intake restored the skin to a normal soft moist texture and appearance within one to two weeks.

Quality of the Cooked Meat of Turkeys Fed Animal or Vegetable Protein Diets with Vitamin and Fat Supplements. Alice M. Harkin, Carroll Kitzmiller and Gladys L. Gilpin (Human Nutrition Res. Division, Inst. of Home Economics, Beltsville, Maryland) and S. J. Marsden. *Poultry Sci.* 37, 1328–39 (1958). Judging panel members scored thigh meat from turkeys fed the vegetable protein diet with dry vitamin A plus 8% lard higher in flavor and as having less off-flavor than meat from turkeys fed each of the other diets under test. Thigh meat and skin from all turkeys fed the animal protein diet containing 0.15% vitamin A and D oil had the most off-flavor and the greatest number of comments of fishy off-flavor.

Estimation of the Monoglyceride Content of Milk. R. G. Jensen and M. E. Morgan (Dept. of Animal Industries, Storrs Agricultural Experiment Station, Storrs, Conn.). *J. Dairy Sci.* 42, 232–39 (1959). Butterfat from both normal and rancid milk obtained by the silica-gel extraction method, employed in the determination of free fatty acids and cottonseed oil digested with pancreatic lipase, were analyzed for total monoglycerides. Normal milk contained from none to a trace when 10-ml. aliquots were analyzed. Acid degree increases ranging from 8.55 to 12.95 were accompanied but not paralleled by increases in 1-monoglyceride content ranging from 0.36 to 0.86 mM per 100 g. fat, and a 2-monoglyceride content ranging from 0.56 to 0.99 mM per 100 g. fat. The presence of diglycerides in rancid milk is indirectly indicated.

Serum Cholesterol in Men: Diet Fat and Intrinsic Responsiveness. A. Keys, J. T. Anderson, and F. Grande (Laboratory of Physiological Hygiene, Univ. of Minnesota). *Circulation* 19, 201–14 (1959). Data obtained from a number of dietary experiments in man yield a formula by which the responses in serum cholesterol to changes in diet can be predicted. In this paper the reliability of this formula is tested and the effects of various types of fatty acids on serum cholesterol are investigated.

The Interaction of Human Low Density Lipoproteins with Long-Chain Fatty Acid Anions. D. S. Goodman and E. Shafrir (Lab. of Cellular Physiology and Metabolism, National Heart Inst. National Insts. of Health). *J. Am. Chem. Soc.* 81, 364–70 (1959). Lauric, palmitic, stearic, oleic and linoleic acids have been compared both in terms of the absolute values of the association constants and in terms of the relative tightness with which they bind to lipoprotein compared to their binding to albumin. The two lipoprotein fractions have been shown to be qualitatively similar in their interaction with the different fatty acids; there is a slight quantitative difference, however, in that the lower density lipoprotein binds all five fatty acids somewhat more tightly. Increasing the ionic strength has been shown to alter the distribution in such a way that relatively more fatty acid becomes associated with lipoprotein. In contrast, altering the pH within the range to 6.8 to 7.7 has very little effect on the distribution. The implications for metabolic studies and for defining the physical state of unesterified fatty acids in plasma have been discussed.

The Effect of Added Fiber with and without Fat in a Practical Broiler Ration. C. E. Richardson, A. B. Watts and E. A. Epps (Poultry Industry Dept., Louisiana State Univ., Baton Rouge, Louisiana). *Poultry Sci.* 37, 1278–83 (1958). Using gain and feed conversion as criteria of performance, it was found that the various fiber sources gave different results. The addition of fat to the rations improved performance in all instances but the magnitude of improvement was influenced by the source of fiber. This fact was emphasized by a fat × fiber interaction within the series of rations containing wheat bran and extracted rice bran.

Advances in Nutrition. C. G. King (Nutrition Foundation, Inc., New York, N. Y.). *J. Am. Dietet. Assoc.* 35, 109–14 (1959). Included in this review is a section of lipid metabolism in which the glyceride structures of natural fats, the role of polyunsaturated fatty acids and epidemiologic studies are briefly discussed.

Effect of Food Restriction on Cholesterol Metabolism. I. Moderate Limitation During Late Adolescence. Ruth Okey, Marian M. Lyman and Betty M. Einset (Dept. Nutrition & Home Econ., Univ. Calif., Berkeley). *J. Am. Dietet. Assoc.* 35, 115–18 (1959). Adolescent rats, which had been reared on 15% protein diets with or without cholesterol, were given diets containing 15 or 30% protein. In each case one group of animals had unlimited access to food and the other group was restricted to ¾ of the amount eaten by the ad lib-fed group. In all cases, reduced food intake resulted in decreased liver size and a proportionate change in liver lipids. The ad lib-fed rats on 15% protein ate more and gained more weight than did animals receiving the 30% protein diet. Fasting serum cholesterol levels were highest in the females on the high protein diet, especially when food intake was restricted.

Cooking with Fats High in Polyunsaturated Fatty Acids. Gladys E. Vail (School of Home Econ., Purdue Univ., Lafayette, Ind.). *J. Am. Dietet. Assoc.* 35, 119–21 (1959). Results are described on the acceptability of baked goods prepared with a corn oil margarine (80% of fat consisting of nonhydrogenated corn oil) instead of the solid fats commonly used. It is concluded that the corn oil margarine may have its greatest advantage in batters mixed by ''quick'' methods, although pastry made with this fat scored consistently higher than that made with a hydrogenated shortening. Flavor acceptability seemed to depend somewhat on individual taste preferences.

Fat, Protein, Sodium, and Chlorides in Diets in Hawaii. Mabel Walker, Nao S. Wenkam and C. D. Miller (Dept. Foods & Nutrition, Univ. Hawaii Agr. Expt. Station, Honolulu). *J. Am. Dietet. Assoc.* 35, 122–7 (1959). Meals for one day were obtained from three local hospitals: three house diets, two low-fat diets, and one house diet served to older Japanese patients. In addition, meals for one day were obtained for a Caucasian home diet and for a Japanese and a Chinese diet as served in restaurants. Each was analyzed for moisture, fat, protein, and sodium; carbohydrate was estimated by difference assuming 2% crude fiber and ash. Calories were calculated. All diets except the low-fat hospital diet contained 40 to 50% of calories as fat.

Lipid Composition of Human Serum Lipoprotein Fraction with Density Greater than 1.210. G. B. Phillips (College of Physicians & Surgeons, Columbia Univ., N. Y. City). *Proc. Soc. Exptl. Biol. Med.* 100, 19–22 (1959). A human serum lipoprotein fraction having a density greater than 1.210 was found to contain about 8% of total serum phospholipid, nonphospholipid ester (presumably triglyceride) and little or no cholesterol. About one-half of the phospholipid was lysolecithin.

ABSORPTION OF H^3-β-SITOSTEROL IN THE LYMPH FISTULA RAT. L. Swell, E. C. Trout, Jr., H. Field, Jr., and C. R. Treadwell (Vet. Admin. Center, Martinsburg, W. Va., and School of Med., Geo. Washington Univ., Washington, D.C.). *Proc. Soc. Exptl. Biol. Med.* **100**, 140-2(1959). Lymph fistula rats were given 44 mg. H^3-β-sitosterol as an aqueous emulsion containing albumin, oleic acid, sodium taurocholate and glucose. Balance data indicated approximately 40% absorption in 48 hr. There was increased fecal excretion of cholesterol and related sterols. There was considerable uptake of the sitosterol by the intestinal wall but essentially no transfer into the lymph. It is suggested that part of the fed sitosterol is transformed in the intestinal wall or lumen so that it is no longer precipitated by digitonin and thus may escape detection.

EFFECT OF OLIVE OIL AND SQUALENE ON CHOLESTEROL MOBILIZATION IN THE RAT. Ruth Okey, Anne Harris, Genevieve Scheier, Marian M. Layman and Shirley Yett (Dept. Nutrition & Home Econ., Univ. Calif., Berkeley). *Proc. Soc. Exptl. Biol. Med.* **100**, 198-201 (1959). Higher values for serum cholesterol were observed in 2 series of female rats fed 1% cholesterol in 10% olive oil than in the series fed similar diets made up with coconut or cottonseed oils. Olive oil-fed males did not have high serum cholesterol values but did have high liver lipids and cholesterol. An attempt to duplicate the effect of olive oil by adding equivalent amounts of commercial squalene to diets containing 10% cottonseed oil and 10% coconut oil is reported. The squalene-fed females on diets with added cholesterol had higher serum cholesterol levels than did those fed cholesterol only but values were not nearly so high as in rats fed cholesterol only. Both males and females fed squalene with cholesterol and coconut oil had significantly higher liver lipids and cholesterol than did littermates fed only coconut oil and cholesterol in the same amounts. Little or no effect attributable to squalene was observed in castrates.

THE FATTY ACIDS OF BLOOD. G. A. Garton (Rowett Research Inst., Bucksburn, Aberdeenshire). *J. Sci. Food Agr.* **10**, 12-19 (1959). Review; 70 references. Topics discussed include: total fatty acids in blood, nature of corpuscular fatty acids, nature of esterified fatty acids, and some aspects of the biochemistry of blood fatty acids.

SULFONAMIDE COMPOSITION COMPRISING A LIPID-AQUEOUS EMULSION CARRIER. W. H. Feinstone. *U.S. 2,867,565.* A therapeutic composition for oral administration is prepared from an absorbable sulfonamide and an aqueous emulsion containing 20 to 60% by wt. of an edible fat.

METHOD OF COATING FOOD ARTICLES. Lorraine E. Patten and H. C. Kelly (Dow Chemical Co.). *U.S. 2,868,656.* The chilled food is coated by dipping into a molten mixture of an ethyl cellulose, an edible fat and a plasticizer.

THERAPEUTIC COMPOSITION. C. E. Meyer (Upjohn Co.). *U.S. 2,870,019.* A fat emulsion for oral and intravenous use is prepared from a metabolizable, non-toxic oil, a sugar, water, and an ethylene oxide-polypropylene glycol condensate.

DETOXIFYING COTTONSEED MEAL. W. H. King (U.S.A., Secy. Agr.). *U.S. 2,873,190.* A process for reducing the free gossypol content of solvent extracted cottonseed meal consists in treating the meal with aqueous alklai and a hot water-miscible, volatile organic solvent. The finished meal has a gossypol content not exceeding 0.01%.

PREPARATION OF COTTONSEED MEAL SUITABLE FOR UNRESTRICTED USE IN LAYING HEN DIETS. W. H. King, A. M. Altschul, J. M. Dechary and V. L. Frampton (U.S.A. Secy. Agr.). *U.S. 2,873,191.* The moisture content of cottonseed flakes is adjusted to 20 to 50% by the addition of water containing at least enough stearyl amine to react with "free gossypol" present in the flakes. The treated flakes are dehydrated by heating until the moisture content is 7 to 13%. The cooled flakes are extracted. The residual meal can be fed in unrestricted amounts to laying hens without producing egg yolk discoloration.

Paints and Drying Oils

SYNTHETIC DRYING OILS AND ALKYD RESINS FROM FATTY-ACID ESTERS OF METHYL-α-D-GLUCOPYRANOSIDE. Zb. Jedliński. *Przemysł Chem.* **35**, 229-33 (1956). Esters were prepared from α-D-glucopyranoside, cameline oil (from *Camelina sativa*), and tall oil, both oils being high in free fatty acids, by using lead monoxide and zinc oxide catalysts. Alkyd resins were prepared from α-D-glucopyranoside, these oils (after esterification with glycerol), the α-D-glucopyranoside esters, and phthalic anhydride. (*C.A.* **53**, 1773)

GLYCERYL-PHTHALIC ALKYD RESINS MODIFIED WITH SOYBEAN OIL AND MODIFIED SOYBEAN OIL. J. P. Helme and J. Molines. *Peintures, pigments, vernis* **34**, 385-400 (1958). Soybean oil is increasingly used as a modifying agent in alkyds. Equally, maleic modified soybean oil advantageously replaces linseed oil in paint vehicles, showing reduced after-yellowing and better color retention. Paints formulated with modified soybean oils have improved brushability. Extensive physical and chemical characteristics of various soybean oil derivatives are given. (*C.A.* **53**, 735)

OIL-SOLUBLE RESINS. II. PREPARATION AND PROPERTIES OF OIL-REACTIVE 100% PHENOL RESINS OF *o*-CRESOL. Ju Kumanotani, Tsutomu Kuwata, Takashi Hiramoto (Univ. Tokyo), Kenji Ueki, and Kyuma Ikeda. *Yukagaku* (J. Japan Oil Chemists' Soc.) **6**, 100-4 (1957). Similar methods as in Part I for preparing resins from *p*-tert-butylphenol (I) were applied in preparing oil-reactive resins from *o*-cresol (II). The II resins were practically suitable for paints and varnish. Especially the resistance against chemicals was higher than the resins from I. The II resin varnish was less soluble in mineral spirit and more soluble in aromatic solvents and the II resin showed lower heat resistance than the I products. The oil-reactive resins from II had mol. wts. 810-850 and methylene ether linkages and methylol groups. The resins from higher amounts of HCHO were better in oil-reactivity, viscosity of varnish, and resistances against heat and chemicals.

FACTORS AFFECTING THE LEVELING OF LATEX PAINTS. B. S. Garrett, W. C. Prentiss, and J. D. Scott (Res. Labs., Rohn & Haas Co., 500 Richmond St., Philadelphia 37, Pa.). *Ind. Eng. Chem.* **51**, 117 (1959). It was concluded that the method outlined is applicable for determining the effects of formulation variables on leveling in general, and on the specific factors controlling the leveling phenomenon, the yield stress, and wicking rate.

MICROBIOLOGICAL DETERIORATION OF WATER-THINNABLE COATINGS. R. T. Ross and S. J. Buckman (Buckman Lab., Inc., Memphis, Tenn.). *Ind. Eng. Chem.* **51**, 116 (1959). Microbiological deterioration of water-thinnable coatings falls into two general categories, spoilage of emulsion paints in the container and disfigurement of paint films. The former is the result of metabolic degradation of resins and emulsion stabilizers, usually by bacterial rather than fungal activity. Disfigurement is the result of mold growth, alone or with soil particles trapped and entrained by vegetative structures.

AIR DRYING WRINKLE COATING COMPOSITION CONTAINING EPOXY RESIN ESTERS. B. E. Lederman (Midland Chemical Corp). *U.S. 2,867,591.* A polymeric condensation product of bisphenol and epichlorhydrin is esterified with drying oil fatty acids by heating at 380 to 540°F. The resultant resinous mass is dissolved in a xylol thinner. To this resinous vehicle are added pigment, an oil soluble metal drier and a polyalkylene polyamine. The resulting mixture dries to a hard wrinkle film.

THERMOPLASTIC POLYAMIDE-EPOXY ADHESIVES. T. C. MORRIS and A. M. Chaplick (B. B. Chemical Co.). *U.S. 2,867,592.* A permanently fusible, thermoplastic adhesive is prepared from the reaction product of a polymeric polyene fatty acid and an alkylene polyamine having at least two primary amino groups, and a resinous polyepoxide.

COATING VEHICLE. R. T. Dean and R. J. Schefbauer (Interchemical Corp.). *U.S. 2,867,593.* A vehicle having rapid dry and good color retention is made from an alkyd resin formed by the reaction of a polyhydric alcohol with glyceride drying oil or drying oil fatty acids and then with an α,β-unsaturated dicarboxylic acid and 2,5-endomethylene Δ-3-tetrahydrobenzyl alcohol.

FURAN RESIN COMPOSITIONS INCLUDING TALL OIL AND AN AROMATIC ALDEHYDE. R. M. Frey (McGraw-Edison Co.). *U.S. 2,868,747.* A thermosetting resin is prepared from furfural or furfuryl alcohol, tall oil and an aromatic aldehyde in the presence of diethyl sulfate as catalyst.

SHELL MOLDING COMPOSITION CONTAINING FATTY ALKYLOL AMIDE CONDENSATE, INERT FILLER AND A PHENOLIC RESIN. R. H. Cooper and J. A. Kelly (Dow Chemical Co.). *U.S. 2,869,195.* The binder for shell molds made of sand is a mixture of a phenol-formaldehyde condensation product and a non-ionic fatty alkylol amide.

RESIN DERIVED FROM POLYHYDRIC ALCOHOL, FATTY OIL, BENZENE TRIBASIC ACID AND CERTAIN GLYCOLS. R. E. Van Strien (Standard Oil Co.). *U.S. 2,870,102.* A process is described for the preparation of an oil modified alkyd resin from the following materials; a polyhydric alcohol; a vegetable oil, fish oil or fatty acids having at least 10 carbon atoms; trimesic acid, hemimellitic acid, trimellitic acid or trimellitic anhydride; ethylene glycol, diethylene glycol, pentaerythritol or bis-hydroxy-ethyl isophthalate.

Method of Producing Drying Oils. J. Weiss (Richard Nilsson Akt.). *U.S. 2,871,135.* The drying oil is a mixture of glycerides with a synthetic oil which is obtained by the condensation of 2 moles of unsaturated higher fatty acids (or their mixtures with saturated acids) with 1 mole of the aluminum compound prepared by the reaction of equivalent amounts of aluminum alcoholate and an enolic compound such as acetoacetic ester, malonic diethyl ester or acetonyl acetone.

Aminoplast Resin Coating Compositions. J. P. Shelley (Rohm & Haas Co.). *U.S. 2,871,209.* The coating compositions is an alcoholic solution of a long-oil alkyd resin, a butylated dimethylolurea, and the monosalt of maleic acid with triethylamine.

Stable Chlorophthalic Acid Modified Unsaturated Alkyd Resin Molding Compositions. J. W. Hyland, Jr. (Allied Chemical Corp.). *U.S. 2,871,215.* A molding composition is prepared from 50 to 85% by wt. of filler and 15 to 50% of a mixture of an amorphous polymerizable unsaturated chlorophthalic alkyd, diallyl phthalate and an organic peroxide polymerization catalyst.

Alkyd Resin Coating for Metals. E. J. Barret, Jr. and D. Flitter (E. I. du Pont de Nemours & Co.). *U.S. 2,873,210.* A metal article is given a baked alkyd resin prime coat and a topcoat of methyl methacrylate lacquer. The alkyd is prepared from hexachloroendomethylenetetrahydrophthalic acid, at least one polyol, and tall oil, semidrying oils, drying oils or fatty acids derived therefrom. The alkyd resin has an oil length of 20 to 45, and acid number less than 50, and unreacted hydroxyl equivalent to 0.5 to 5.0% by wt. of glycerol based on the total weight of the resin.

• Detergents

Fluorescent Brightening Agents. D. A. W. Adams (Hickson & Welch Ltd., Castleford, Yorkshire, Engl.). *J. Soc. Dyers & Colourists* **75**, 22–31 (1959). The nature of fluorescent brightening agents, their historical development, properties, and uses are reviewed, and some details are given of their application in soap and detergents, in textile processing, and in the production of paper. Their chemical constitution is then discussed, and indications are given of the effect on their properties of changes in structure. 120 references.

Synthetic Detergents as a Factor in Water-Softening Economics. W. W. Aultman and J. M. Montgomery. *J. Am. Water Works Assoc.* **50**, 1353–64 (1958). The relation between soap and syndets is discussed. The average expense and desirability of water softening is also considered. The point is made that syndets do not perform as well in hard as in soft water, and in many cases softening is still necessary. Other advantages of water softening are cited. 23 references. (*C.A.* **53**, 1603)

Synthesis and Biotesting of Metallic Surfactants. J. N. Bone and D. W. O'Day (Univ. of Wyoming, Laramie). *J. Am. Pharm. Assoc.* **47**, 795–9 (1958). The Ag, Hg, Pb, Zn, Cu, and Fe salts of lauryl sulfate (I) were prepared by refluxing Na alkylsulfate and the appropriate metallic sulfate in 95% EtOH and those of dioctylsulfosuccinate (II) and isopropylnaphthalene sulfonate (III) by adding the proper oxide, hydroxide, or carbonate to the surfactant freed from Na by treatment with 40% H_2SO_4 in 95% EtOH. The antifungal activity of all 6 metals as surfactants was greater than the corresponding sulfates, chlorides, or nitrates. The Cu, Fe, Zn and Pb surfactants were also more active against bacteria, but the Hg and Ag surfactants were less active than the inorganic salts. There was no appreciable difference between the 3 surfactants in the potentiation of the activity of the metals except with the Fe, Hg, and Ag salts of I which seemed to have greater activity than the corresponding compounds with II and III. (*C.A.* **53**, 2651)

Nonionic Detergents in Raw-Wool Scouring Including Studies of Waste Clarification. W. Fong (Western Regional Research Laboratory, Albany, Calif.). *Am. Dyestuff Reptr.* **48**, 45–50 (1959). Several types of nonionic detergent, representing polyethylene glycol derivatives and alkylolamides, were compared in laboratory studies of raw-wool scouring. Scouring effectiveness was measured at various pH's. Among polyethylene glycol derivatives the alkylpolyoxyethylene ethers were uniquely effective under acid scouring conditions. They showed excellent cleaning effectiveness and low detergent consumption independent of pH over a range of 4 to 10. However, in common with other polyethylene glycol derivatives, the waste liquors produced were exceedingly difficult to clarify. On the other hand, alkylolamides, particularly those containing a high proportion of hydroxylethyl lauramide, exhibited the dual advantages of excellent neutral scouring efficiency and uniquely effective waste liquor clarification by simple cold acid-cracking.

Chromatographic Separation of a Nonionic Polyether Surfactant. J. Kelly and H. L. Greenwald (Rohm & Haas Co., Bristol, Pa.). *J. Phys. Chem.* **62**, 1096–8 (1958). A mixed *p*-tert,tert-octylphenoxypolyoxyethylene-EtOH with 9.7 CH_2O units per phenol was separated into its components by chromatography. Silicic acid columns were used with mixed $CHCl_3$-acetone eluents. The shape of the elution curve suggested that the resolution was sufficient for the isolation of very pure species. Agreement with the expected distribution of species from the ethylene oxide-phenol condensation reaction was satisfactory. (*C.A.* **53**, 810)

The Analysis of Shampoos. S. H. Newburger (Food & Drug Admin., Washington, D.C.). *J. Assoc. Offic. Agr. Chemists.* **41**, 664–8 (1958). An ion-exchange resin method is proposed for shampoos containing an alkyl sulfate and a fatty acid-alkanolamine condensate as active ingredients. An analysis scheme is given by chart. Soap can also be determined. The procedure is probably applicable to emulsions containing sulfated and sulfonated esters. (*C.A.* **53**, 2542)

Effect of Hardness of Water on the Soil-Removing and -Suspending Power of Sodium Carboxymethylcellulose. K. J. Nieuwenhuis and K. H. Tan. *Teintex.* **23**, 629–48(1958). Water-hardness affects both the removing and suspending powers of Na carboxymethylcellulose (I). Low soap content and approximately 100 mg. (I) per liter are less affected than high soap content and no I, tested in waters of 0–20° French hardness. In soft water the increase in removing power with addition of I is most marked with low soap concentrations, but in the same medium the soap concentration has hardly any influence on the suspending power.

Assay of Hexachlorophene and Bithionol in Solid and Liquid Soaps, Emulsions and Dusting Powders. H. J. van der Pol (Brocades-Stheeman Pharm., Meppel, Neth.). *Pharm. Weekblad* **93**, 881–6 (1958) (in English). The best method for the determination of hexachlorophene (I) is that of Childs and Parks. This method works well on liquid soaps but on solid soaps a turbid solution results. To overcome this, the solvent must be changed from 90% MeOH to 99–100% MeOH. The reagents are likewise made up in 99–100% MeOH. The method is applicable for the determination of bithionol. (*C.A.* **53**, 2539)

Is It at Last Possible to Measure the Detergent Power? J. Vallee. *Teintex* **23**, 321–36 (1958). A description is made of a stretching method using the Thibaud apparatus for measuring the detergent power. Nine synthetic detergents at various concentrations were studied. The method is compared with launderometer tests. Detergent properties are evaluated irrespective of soils, fabrics, stirring, temperature, rinsing, bleaching agents, and optical dyes. (*C.A.* **53**, 1787)

Determination of Synthetic Detergent Content of Raw-Water Supplies; Task Group Report. J. C. Vaughn (Dept. of Water & Sewers, Chicago). *J. Am. Water Works Assoc.* **50**, 1343–52 (1958). It is estimated that 90% of the washing products used in the home are synthetic detergents. The characteristics of these are described. The most widely used is the alkylbenzenesulfonate (ABS). Its characteristics are outlined. Methods for detection and determination are described and discussed. Graphic formulas are given. Several analytical methods are given in detail. (*C.A.* **53**, 2513)

Manufacture of Surface-Active and Washing Agents by Sulfonation of the Products of Oxidation of Thoroughly Hydrogenated Petroleum Fractions. V. V. Veselov, I. S. Kataeva, D. B. Orechkin, and N. V. Popova (Ester Plant, Moscow). *Masloboino-Zhirovaya Prom.* **24**(10), 19–22 (1958). Preliminary data are presented to show that alkylsulfates can be produced from thoroughly hydrogenated oxidized, and then reduced petroleum fractions. (*C.A.* **53**, 1787)

Effect of Ethylene Glycol on the Colloidal Properties of Aqueous Solutions of Sodium Oleate. A. I. Yurzhenko and G. F. Storozh (I. Franko Univ., L'vov). *Kolloid Zhur.* **20**, 550–5 (1958). EtOH and $(HOCH_2)_2$ affect the viscosity, the turbidity, and the electrical conductivity of Na oleate solutions. They lower the critical concentration of micelle formation of Na oleate. (*C.A.* **53**, 1892)

A Trend of Application of Surface Active Agents in Petroleum Industry. Haruzi Yamamoto (Mitsubishi Petroleum Oil Co., Kawasaki). *Yukagaku* (J. Japan Oil Chemists' Soc.) **7**, 125–8 (1958). A review with 6 references.

Surface Active Agents in Petroleum Industry. Yuzo Koga (Tôa Nenryô Kôgyô Co., Shizuoka-ken). *Yukagaku* (J. Japan Oil Chemists' Soc.) **7**, 327–31 (1958). A review with 25 references.

Separate Determination of Nonionic Surfactant in the Presence of Ionic Agent. Masao Kurata and Shigejiro Inoue (Dai-ichi Kôgyô Seiyaku Co., Kyoto). *Yukagaku* (J. Japan Oil Chemists' Soc.) **6**, 92–6 (1957). As the nonionic surfactant higher alcohol ethers of polyoxyethylene glycol were used with H.L.B. of 16 and 12. Anionic agents (Na sperm alcohol sulfate or Na alkylbenzenesulfonate) or cationic agents (oleyl picolinium chloride) were added to the solutions (0.07–0.3%) of nonionic agents. To 3 mequiv. of such mixture 8 mequiv. of ion-exchange resin was used at the flow rate of 0.14–0.22 cc./cc. resin/min. The nonionic agent was determined on the effluent in the recovery of 96.8 ± 2.5%.

Assay of Both Nonionic Surfactant and Quaternary Ammonium Salt in the Mixture. In Combination of Ferricyanide and Epton Methods or of Ferricyanide and Bromophenol Blue Methods. Masao Kurata and Shigejiro Inoue. *Yukagaku* (J. Japan Oil Chemists' Soc.) **6**, 96–100 (1957). The mixture of higher alcohol ether of polyoxyethylene glycol (H.L.B. 18) and oleyl picolinium chloride or lauryltrimethylammonium chloride could be separately determined by combining known methods.

Packaged Charge for Making Soap. B. H. Thurman (Union Stock Yard and Transit Co. of Chicago). *U.S. 2,861,953.* A dry soap charge package by which soap may be made wherever it is used, consists of approximately 45% of yellow grease containing at least 5% free fatty acid, 8–9% caustic soda, 25% of a 51% sodium silicate solution and 21–22% water softeners such as phosphates, carbonates and silicates, the caustic, sodium silicate solution and water softeners being distributed through the saponifiable material so that the grease coats and covers them.

Detergent for Hard Water. R. D. Aylesworth (Emery Industries, Inc.). *U.S. 2,861,955.* It has been found that, despite the common assumption that cationics and anionics are incompatible, the precipitation of fatty acid soaps in hard water can be prevented by producing a soap consisting of 10–20% quaternary ammonium compound having a molecular weight of between 175 and 600 with from 80–90% of fatty acid soaps such as the sodium salts of fatty acids from 8-22 carbon atoms.

Liquid Detergent Compositions. L. Fernandez (Monsanto Chem. Co.). *U.S. 2,861,956.* A liquid household detergent with abundant stable foams, resistant to hard water and easy on the hands can be prepared by mixing together varying proportions of a low molecular weight aliphatic alcohol, water and a water-soluble salt of a sulfated condensation product of about 1 to 5 moles of ethylene oxide with 1 mole of a C_{10}–C_{18} aliphatic alcohol.

Detergent Composition of Improved Foam Performance. R. D. Stayner (California Research Corp.). *U.S. 2,863,836.* A detergent having foam of good quality, stability and persistence may be obtained by adding to the organic sulfate detergents a fatty acid amide such as palmitamide and/or myristamide and a straight-chain C_{10}–C_{14} saturated *p*-acyl phenol, or a monoethylene glycol or diethylene glycol ether of phenol.

Germicidally Active Soap Containing Reaction Product of Silver Salt and Ethylenethiourea. M. M. Baldwin (Permachem. Corp.). *U.S. 2,864,768.* A germicidally active soap composition consists of a water-soluble, higher fatty acid soap and a germicidal amount of a reaction product of silver chloride and ethylene thiourea, said reaction product being characterized by a ratio of three moles of ethylenethiourea to one mole of silver chloride.

Hydrazides and Soap Stability. Unilever Ltd. *Brit. 795,674.* It has been found that the deterioration of odor of soap which occurs during storage can be retarded by the incorporation of certain hydrazides, which have the particular advantage that they have little or no tendency to react with perfume components which contain carbonyl groups. The hydrazides can be incorporated in soap at any stage of manufacture, for example, in the fat charge before saponification or in the soap at the crutching or milling stage.

Nonionic/Cationic Detergent Bars. Imperial Chemical Industries. *Brit. 795,814.* Bactericidal detergent bars are made consisting of one condensation product of one molecular proportion of an alkyl phenol with 2 to 6 molecular proportions of ethylene oxide and at least one surface-active quaternary ammonium bactericidal compound. Such bar detergent compositions can be used for the washing and cleaning of equipment used in the handling and preparation of food, the cleaning of dishes, etc.

Detergent Compositions. Thomas Hedley & Co., Ltd. *Brit. 802,302.* A heavy duty detergent with depressed sudsing action consists of a water-soluble anionic synthetic detergent salt such as a sulfate or sulfonate, at least an equal amount by weight of alkali metal polyphosphate, and a suds depressant mixture comprising at least three compounds having acyl radicals of different carbon atom content and in the form of saturated fatty acids having from 16 to 31 carbon atoms, with the mixture containing more than 50% of the compounds having at least 16 carbon atoms and at least 5% of the compounds having at least 20 carbon atoms.

A Stabilized Soap-Containing Composition. Olin Mathieson Chemical Corp. *Brit. 802,447.* Soap compositions in various forms, cakes, bars, liquid, etc. containing phenolic bactericides can be stabilized with respect to color and odor formation by the addition of minor amounts of azines, non-aromatic hydrazides, or hydrazinium salts of organic acids.