Acknowledgment

The analyses for trichloroethylene reported in this paper were run by I. Eisdorfer, who used a distillation and infra-red absorption method devised in these laboratories. In this method 400 g. of oil are distilled with 200 ml. of deodorized kerosene and the first 40 ml. of distillate examined for infra-red absorption at 10.8 microns. This method has been superseded in our laboratories by the method of Eisdorfer and Mehlenbacher (1), which has proven to be superior in many respects.

REFERENCE

1. Eisdorfer, I., and Mehlenbacher, V. C., J. Amer. Oil Chem. Soc., 28, 307 (1951).

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ABSTRACTS . . . . Don Whyte, Editor

• Oils and Fats

R. A. Reiners, Abstractor

Molecular rotation in some long-chain fatty acid esters in the solid state. R. W. Crowe and C. P. Smyth (Princeton Univ.). *J. Am. Chem. Soc.* **73**, 5401(1951). A plot of the measurements of the dielectric constant of very pure stearic acid at various temperatures shows a sharp break at the freezing point. Due to its strong tendency to form non-polar dimers, the dielectric properties of this compound resemble closely those of a long-chain hydrocarbon. Dielectric constants and loss factors were also measured on a series of high molecular weight alcohol esters of stearic and palmitic acids.

A study of the n-octadecenoic acids. III. X-ray diffraction behavior of 6,7- through 12,13-dihydroxystearic acids. E. S. Sutton, W. F. Huber, A. J. Mabis and C. B. Stewart (Procter & Gamble Co.). *J. Am. Chem. Soc.* **73**, 5206(1951). Both the low-melting and the high-melting series of 6,7- through 12,13-dihydroxystearic acids show alternation of properties. By m.p.'s and interplanar spacings it is possible to classify these acids into 4 subgroups, namely, the even (6,7-, 8,9- etc.) and the odd (7,8-, 9,10-, etc.) low-melting and the even and odd high-melting isomers. Within each subgroup the individual members cannot be satisfactorily distinguished by means of m.p. and interplanar spacings. They can be distinguished, however, by the relative intensities of the different orders of their long spacings. Polymorphism was detected in the 6,7-acids and the 9,10-acids.

Displacement analysis of lipids. VI. Separation of unsaturated acids. R. T. Holman and W. T. Williams (Texas A. and M. College System, College Station). *J. Am. Chem. Soc.* **73**, 5285 (1951). Separations of saturated and various unsaturated fatty acids of the same chain length have been made with acids varying in chain length from 4-18 carbon atoms using charcoal as adsorbent and aqueous ethanol as solvent. Non-conjugated unsaturation decreases adsorption, carboxyl conjugated conjugation increases adsorption. Linoleic and oleic acids are separable, but they both lie between myristic and palmitic acids in adsorbability. Impurities in fatty acid preparations which were not removed by repeated distillation were detected by chromatographic separation.

VII. Carrier separation of unsaturated fatty acids. R. T. Holman. *Ibid.* 5289. The positions of a series of single unsaturated fatty acids in a carrier displacement chromatogram have been determined using methyl esters of even saturated acids in one series and methyl esters of odd saturated acids in another. Darco G 60 was the adsorbent and 95% ethanol was the solvent. It was found that increasing the number of isolated double bonds decreases the adsorption, changing a saturated acid to an unsaturated acid to an acetylenic acid decreases adsorption, and conjugation of double bonds increases adsorption. Differences in adsorbability of *cis*- and *trans*-isomers are slight. One isolated double bond in the molecule decreases adsorption roughly equivalent to 2 less carbon atoms. Separation of stearic and linoleic acids and of linoleic acid and its conjugated isomer by carrier displacement are demonstrated.

Component fatty acids of rapeseed oil. C. G. Youngs, T. M. Mallard, B. M. Craig and H. R. Sallans (Nat. Res. Labs., Saskatoon, Sask.). *Can. J. Chem.* **29**, 871(1951). The fatty acid composition of the oil from Argentine rapeseed grown in Western Canada was investigated by converting the glyceride esters to methyl esters and distilling the latter in a Podbielniak Heligrid column. Results indicated that the erucic acid content of this oil was 40% and the eicosenoic acid content 12% as compared with 47-50% and 3-6% reported by previous investigators. The methyl esters were prepared by the conventional method in 88% yield and by the use of dimethyl sulfate in 99.4% yield. Essentially the same results were obtained on distillation of these esters indicating that a representative sample was obtained in the former case.

Polymerizable derivatives of long-chain fatty acids. IV. Vinyl esters. W. S. Port, J. E. Hansen, E. F. Jordan, Jr., T. J. Dietz and D. Swern (Eastern Reg. Res. Lab., Philadelphia, Penna.). *J. Polymer Sci.* **7**, 207(1951). Vinyl esters of saturated fatty acids polymerize readily and rapidly. Vinyl oleate, when present in excess of 5%, and oxygen exert marked retarding effects. Properties of the polymers and polymerization techniques are described.

Hydrolysis of wool wax and related high molecular weight esters. I. Homogeneous reactions. E. V. Truter (Univ., Leeds, 2). *J. Applied Chem.* **1**, 452(1951). The homogeneous alkaline hydrolysis of the acetates, caprylates, and palmitates of n-octadecanol and cholesterol in alcohols has been studied. The constants of the reactions are within the anticipated range indicating that any difficulties encountered in the heterogeneous saponification of wool wax must be due to surface phenomena.

II. Heterogeneous reaction: oil-in-water emulsions. *Ibid.*, 454. The aqueous alkaline hydrolysis of wool wax, n-octadecylcaprylate and palmitate and cholesteryl acetate and caprylate as oil-in-water emulsions stabilized by various agents, has been examined. When about one-third of the wax has been saponified the rate of reaction is considerably diminished because the alcohols liberated in the reaction compete with the esters for places in the interface and the latter are excluded by a mass-action effect. Complete saponification as an oil-in-water emulsion will only be possible if these alcohols can be removed from the interface.

Residual oil in extracted soybean flakes is 0.5% using solvent-flake ratio of 0.85. Anon. *Chem. Proc.* **14**(11), 46(1951). Operation of the Rotocel extractor installed in the Indianapolis plant of Glidden Co. is described.

Develop new type traveling screen extractor for cotton seed. Anon. *Oil Mill Gaz.* **56**(5), 13(1951). A total immersion countercurrent type extractor is described in which the flakes are passed in a zig-zag pattern down the rectangular extraction column by means of a series of horizontally traveling stainless steel screens. High efficiency is claimed.

Selective extraction of a fish oil with furfural. Ma. A. de Lamo, R. Montequi and A. Doadrio. *Pubs. inst. quim. "Alonso Barba"* (Madrid) **4**, 295-301(1950). Striped-tunny oil of good quality and furfural were heated on a water bath until in solution, and the temperature was noted. After standing 24 hours the two layers were separated, and the percentage oil and furfural in each was determined before and after vacuum distillation. It was most convenient to segregate at 40° with a furfural: oil ratio of 4:1. The iodine no. of the residue oil was 184.6 while that of the extracted oil was 220. The iodine no. of extracted oil diminished with rise in extraction temperature. (*Chem. Abs.* **45**, 9283)

Indian edible oils. Unsaponifiable matter. K. Ramamurti and B. N. Banerjee (Indian Inst. Sci., Bangalore). *Indian J. Med. Research* **38**, 377-83(1950). The unsaponifiable matter from peanut oil, sesame oil, and coconut oil were studied. As rancidity increases (1) the iodine no. of both alcohol-soluble and insoluble fractions of the unsaponifiable matter increase; (2)

the alcohol-insoluble unsaponifiable matter increases; (3) antioxidant properties decrease; and (4) the sterol and tocopherol proportion of the unsaponifiable matter decreases. These changes are more pronounced in peanut oil than sesame oil, and least in coconut oil. (*Chem. Abs.* **45**, 9283)

Crystal structure of lauric acid. V. Vand, W. M. Morley and T. R. Lomer (Lever Bros., Cheshire, England). *Acta Cryst.* **4**, 324-9(1951). Lauric acid (form C or a) is monoclinic with $a = 9.524 \pm 0.02$, $b = 4.965 \pm 0.01$, $c = 35.39 \pm 0.07$ A., $\beta = 129°13' \pm 1'$. The cell contains 4 molecules; density observed 1.032, calculated 1.034 g./cc. The space group is $C^5_{2h} - P2_1/a$. Fourier projections were prepared and atomic coordinates determined. The angle of tilt $\tau = 54°52'$. (*Chem. Abs.* **45**, 8844)

Chemical composition of the drupes of Rhus succedeanea. II. Fatty oil from the seed. F. C. Chen (Natl. Taiwan Univ., Formosa). *J. Taiwan Pharm. Assoc.* **2**, 20-2(1950). The fatty oil from the seeds consists of glycerides (25.4% palmitic, 46.8% oleic, and 27.8% linoleic acids), phytosterol and sitosterol. (*Chem. Abs.* **45**, 9282)

Determination of linoleic acid in glycerides. A. R. S. Kartha, K. N. Menon and P. S. Raman. *Current Sci.* (India) **18**, 8-9 (1949). Stainsby's method for the determination of linoleic acid in edible fats, by oxidation with $KMnO_4$ in acetone, removal of volatile acidic products, and titration of acidic glycerides, gave the values 51.5, 54.2, and 58.5% for a synthetic glyceride containing 40% of linoleic acid. This was believed to be due to hydrolysis of azelao-glycerides during oxidation or the alkali titration. (*Chem. Abs.* **45**, 9282)

Lard and its recognition. G. N. Nielsen. *Dansk Tids. Farm.* **21**, 256-9(1947). The presence of hardened oil in lard substitutes made from hardened oil and liquid oil is rendered certain not only by determining the usual values (iodine no., saponification no., etc.) but by determining the iodine no. of the solid fatty acids separated by the Pb salt-alcohol method. Natural fats give values of at most 4-5, usually less, whereas in hardened oils of the lard-like consistency they are approximately 40. (*Chem. Abs.* **45**, 9281)

The relation of the aniline point and iodine number of fats. F. Th. van Voorst (Keuringsdienst voor Waren, Alkmaar, Netherlands). *Chem. Weekblad* **47**, 333-5(1951). A straight line relates the iodine no. and aniline point of oils and fats, except for those having an "abnormal" (higher than 200 or lower than 190) saponification no. (*Chem. Abs.* **45**, 9281)

Determining the amount of fat in olive-oil residues. R. Casares-Bescansa (Munic. Lab., Malaga, Spain). *Anales bromatol.* (Madrid) **2**, 375-7(1950). To determine oil in olive-oil tank sediment a 50-cc. sample in a graduated cylindrical separatory funnel is left to stand for several minutes, an equal volume of carbon tetrachloride is added, mixed, and after settling the carbon tetrachloride layer is withdrawn and its density is determined (Westphal balance). The percentage of fat in the original sample of residue is calculated from the equation $\% \text{ fat} = (D - d') \times 100/d' - d$; where D = density of solvent (1.58); d = density of the fat (olive oil is 0.92); d' = density of the extract. The accuracy is adequate for technical purposes. (*Chem. Abs.* **45**, 9281)

Applications of crystalline addition products of urea and organic substances to the chemistry of fats. I. Separation of mixtures of triglycerides and fatty acids. Preliminary laboratory note. J. M. M. Moreno, A. V. Roncero and J. F. Jimenez (Inst. especial grasa y derivados, Seville, Spain). *Anales real soc. espan, fis. y quim.* **47B**, 229-34(1951). Based on the fact that urea and thiourea form addition products with saturated and unsaturated fatty acids and their aliphatic monohydric alcohol esters, but not with triglycerides and oxidized fatty acids, the following separations are possible: (a) triglycerides from fatty acids, (b) oxidized from monoxidized fatty acids, (c) chaulmoogric acid from straight-chain acids, and (d) fatty acid from turpentine pine resinous acids. (*Chem. Abs.* **45**, 9281)

Determination of peroxides in fat. N. Drozdov and L. Starikova. *Myasnaya Ind. S.S.S.R.* **22**, No. 3, 52-5(1951). Various common methods of determining the peroxide value of fats gave different results on the same sample. Use of different mineral acids, different concentrations of an acid, and different reaction times also affected the results. A new method was developed which gave sharp consistent results. In a 150-200-ml. flask add 2 ml. 60% H_2SO_4 or 5 ml. HCl and 1 ml. dimethylaniline; mix, cool, and add a solution of 1 g. test fat in 5 ml. chloroform or 5-20 ml. dichloroethane and 1 ml. saturated solution KI; mix for 1 minute, add 50 ml. water and a measured amount of excess 0.01 *N* solution of $Na_2S_2O_3$; mix well and titrate excess $Na_2S_2O_3$ with a 0.01 *N* I solution with starch as the indicator. (*Chem. Abs.* **45**, 9281)

Liver oils of Adriatic Elasmobranchia. I. Preliminary report. S. Cmelik. *Rep. Fish. Sta., Split* **1947**, 1, 4 pp. The livers of various specimens of *Elasmobranchia* from the Adriatic gave values of 15-50% for water (by distillation with xylene) and values of 40-60% for oil (by extraction with ethyl ether and drying at 70°) contained in the fresh organs. (*Chem. Abs.* **45**, 9184)

The existence of a β'-phase in higher monoacidic triglycerides. G. B. Ravich and E. G. Voronova. Doklady Akad. Nauk S.S.S.R. **77**, 1035-7 (1951). Thermal analysis of carefully purified tripalmitin gives an inflection at 46.5°, corresponding to melting of the γ form, and an inflection at 54-5.5°, corresponding to solid transformation of α into β'. The results show the existtence of 4 phases: glassy γ form, metastable crystal α and β' phases, and stable crystal β phase. Photomicrographs of specimens are shown. (*Chem. Abs.* **45**, 8864)

The lipids of microbes. I. The effect of temperature on the lipid formation by fungi. Yo Imai (Hokkaido Univ., Sapporo). *J. Japan. Biochem. Soc.* **22**, 192-6(1950). Cells of 2 strains of *Peniccilium chrysogenum*, grown on acidic Czapek-Dox medium at 4, 16, 22, and 26°, respectively, were extracted with methanol-ether (3:1) and the lipids, after purification with ethyl ether, fractionated and analyzed. More lipids were formed in the mold cells at higher temperatures. Phosphatide content was greater at higher temperatures, while more unsaturated fatty acids were present in the phosphatide fraction when growth was at lower temperatures. Fatty acids of nonphosphatide nature were mainly composed of C_{18}-acids (average molecular weight, 280-296); the ratio of liquid to solid acids becoming smaller at higher temperatures (*Chem. Abs.* **45**, 9121)

The transformation of long-chain acid amides. T. Sakurai (Univ. Tokyo). *J. Phys. Soc. Japan* **6**, 199-200(1951). Small anamolies in the specific heat were observed at 56° for palmitamide and at 64° for stearamide. The heats of transformation were approximately 150 and 155 cals./mol., respectively. The electrical conductivity of palmitamide increased greatly at the transformation temperature, whereas that of stearamide showed no great change above the transformation temperature. These transformations are similar to those observed with alkali soaps near the melting point of the corresponding fatty acids. (*Chem. Abs.* **45**, 8852)

The influence of nonglyceridic constituents on autoxidative rancidity of sesame oil. S. A. Saletore and N. H. Harkare (Nagpur Univ.). *Current Sci.* (India) **20**, 10-11(1951). Sesame oil was subjected to processing treatments and the peroxide value and odor were determined after each stage. The constituents present in the husk of the seed have little effect on the keeping quality of the oil. Removal of sesamin has little effect, but removal of sesamol and fatty acids causes rapid deterioration. Treatment of this latter oil with Al_2O_3 removes oxidants and gives an oil of good stability. If this Al_2O_3-treated oil is treated with charcoal, it again rapidly deteriorates. (*Chem. Abs.* **45**, 9898)

The analytical constants and composition of fatty acids of Egyptian fenugreek oil. M. Shahat (Fouad I Univ., Cairo, Egypt). *Proc. 11th Intern. Congr. Pure Applied Chem.* (London) **3**, 569-575(1947). The following constants were obtained from analyses of a purified fenugreek oil: d_{25} 0.910, n_{25} 1.4741, acid no. 2, saponification no. 178, iodine no. 115, CNS no. 77.2, hexabromide no. 36, unsaponified matter 3.9-4%, sterols 1.3-1.5%, phospholipids 0.09-0.12%, f.p. of fatty acids 21°, m.p. of fatty acids 24, n_{40} of fatty acids 1.463, saturated acids 15.7, unsaturated acids 83.5. Reichert-Meissl no. 0.15, and Polenske no. 0-0.05. The composition of fatty acids was palmitic 9.68, stearic 4.92, arachidic 2, behenic 0.9, oleic 35.11, linoleic 33.72, and linolenic acid 13.8%. (*Chem. Abs.* **45**, 9896)

Hydration of phospholipids in presence of glycerides. P. Desnuelle, J. Molines and D. Dervichian. *Bull. soc. chim. France* **1951**, 197-203. The glycerol mono-ester of peanut oil acids was prepared by careful hydrolysis of peanut oil with aqueous NaOH solution. Peanut and soybean phospholipids dissolved in the mono-esters to give clear solutions which became cloudy in the presence of water and deposited crystals of hydrated phospholipids. The interfacial tension, mono-ester-water, is profoundly modified by the addition of minute quantities of phospholipids (5 mg./100 g.). (*Chem. Abs.* **45**, 9897)

Purification of mustard oil contaminated with argemone oil. Om Prakash, A. Ram and B. Prakash (H. B. Technol. Inst., Kanpur). *Current Sci.* (India) 20, 16-17(1951). The oil is stirred vigorously with 10% its weight of 20% $FeCl_3$ solution for 20 minutes, the emulsion is kept on a water bath for 0.5 hr., allowed to settle, and filtered through fuller's earth. (Chem. Abs. **45**, 9898)

Rapid method for the determination of solvent residues in extraction meals. A. Schramme. *Fette u. Seifen* **53**, 342-3(1951). The method consists of passing superheated steam through the meal, igniting the vapors, and estimating the solvent content from flame size and time of burning. (*Chem. Abs.* **45**, 9897)

Turkish vegetable oils. T. Yazicioglu (Univ. Ankara, Turkey). *Fette u. Seifen* **53**, 189-90(1951). Turkish production methods are reviewed and the following constants are reported for the oil from *Cephalaria syrica:* d^{20} 0.9263; n^{20} 1.4716; η^{20} 84 centipoises; solidification point —15°; acid no. 6; saponification no. 194; iodine no. 85; thiocyanogen no. 65; hydroxyl no. 20; Reichert-Meissl no. 0.25; Polenske no. 0.15; unsaponifiable 1.32%. (*Chem. Abs.* **45**, 9897)

The possibility of direct titrimetric determination of the iodine number. O. Tomicek and I. Dolezal. *Acta Pharm. Intern.* **1**, 31-41(1950). Weighed samples were dissolved in acetic acid, 3-5 ml. of saturated sodium acetate in acetic acid was added, and the mixture diluted to 25-30 ml. with acetic acid, heated to 50-60°, and titrated potentiometrically with 0.1 *N* Br in acetic acid with a bright Pt electrode and calomel reference electrode. With phenol, α-naphthol, pyrocatechol, resorcinol, hydroquinone, thymol, cholesterol, and limonene sharp end points were obtained corresponding to stoichiometric substitution or addition reactions. With fatty oils and essential oils iodine numbers were in general lower by this method than by the methods of Hanus, Huhl, or Rosemund-Kuhnhenn. (*Chem. Abs.* **45**, 9897)

Relation between glyceride structure and physical properties. E. Schlenker (Fournier-Ferrier, Marseilles, France). *Fette u. Seifen* **53**, 191-3(1951). Several mixtures were prepared from fats of known glyceride compositions and their m.p.'s and consistencies were measured. Tri-saturated and tri-unsaturated glycerides either have no influence on these properties or it can be compensated for by di-saturated, mono-unsaturated and (or) mono-saturated, di-unsaturated glycerides. (*Chem. Abs.* **45**, 9896)

Reaction kinetics of branched-chain fat acids. I. Hydrogen-ion-catalyzed esterification of branched-chain acids with methanol. K. E. Schulte and J. Kirschner (Deut. Forschungsanst. Lebensmittelchemie, Munich, Ger.). *Fette u. Seifen* **53**, 267-73 (1951). The acid-catalyzed esterification represses the dissociation of the acid to be esterified and brings out the keto character of the carboxyl group. The alcohol complex ion ROH_2^+ may also act as a proton donor, giving a proton to the O of the semipolar carboxyl group; this increases the polarization of the carboxyl group and enables it to attach the alcohol to the C atom. (*Chem. Abs.* **45**, 9895)

Study of ternary mixtures of fatty acids. V. Freezing points of mixtures of palmitic, stearic, and oleic acids. C. Paquot and Mme. L. Durrenberger (Lab. C.N.R.S., Bellevue, France). *Bull. soc. chim. France* **1951**, 350-353. A ternary diagram of the f. ps. of mixtures of palmitic, stearic, and oleic acids is given which can be used either with the acid or iodine number to establish the composition of the ternary mixture. The 3 determinations can be used in pairs to get 3 values for any particular composition.

VI. Freezing points of mixtures of stearic, oleic, and linoleic acids. C. Paquot and J. Mercier. *Ibid.* 353-355. The ternary diagram of the f. ps. of mixtures of stearic, oleic, and linoleic acids given is insensitive where the amount of stearic is low. A new type of diagram, with rectangular coordinates, gives percentage of stearic on a greatly extended scale as the ordinate, and the relative amounts of oleic and linoleic as the abscissa. (*Chem. Abs.* **45**, 9895)

Significance of the acid value for grading of fats. V. Sudachenkov. *Myasnaya Ind. S.S.S.R.* 22, No. 4, 29-30(1951). Pork and beef fats of various grades and one sample each of bone and mutton fats were investigated to show differences in organoleptic characteristics, stability, Kreis test, and peroxide value that may occur at different acid numbers. (*Chem. Abs.* **45**, 9893)

The unsaponifiable of fats. IV. R. Lombard. *Oléagineux* **6**, 587-595(1951). This is a review paper which covers wool grease, fish liver oils, isolation and applications of cholesterol, isolation of ergosterol, isolation of β-carotene and a review of the vitamins A, D, E, and K.

The problems of lubricating textiles. A. Parisot *Oléagineux* **6**, 577-585(1951). The problems of obtaining a satisfactory lubricant for use in the textile industry is discussed. In general, the fatty oil should be a good lubricant, be easily emulsified, non-oxidizable, non-resinifiable and be easily removed from the fiber.

Identification of olive pulp oil extracted by trichlorethylene. B. Barsanti. *Olearia* **5**, 238-239(1951). The Wittka process which is based on the solubility of several kinds of olive pulp oil in extraction naphtha has been found useful for ascertaining the presence of oil extracted by trichloroethylene in mixtures with oil extracted by carbon disulfide.

Parallelism between the structure of fats and that of synthetic textiles. A. Parisot. *Oléagineux* **5**, 639-643(1950). A textile consists of linear, non-ramified macro-molecules placed parallel to one another and linked by secondary linkages of the van der Waals and hydrogen-bonding types. The molecules of the fatty series are placed similarly parallel to one another, but for these, longitudinal cohesion is much weaker than in the case of textile molecules. The comparison between paraffins or fatty acids and condensation polymers also shows a striking similarity between the curves of melting points when plotted as a function of the number of carbon atoms.

The sweet lupine. II. Constitution of the fat of the sweet lupine. K. Nehring and R. Schiemann (Univ. Rostock, Ger.). *Fette u. Seifen* **53**, 10-15(1951). The fat content of *Lupinus albus, L. luteus,* and *L. augustifolius* were found to be 11.01, 6.31, and 5.04%, respectively, (all on dry basis). The fat had an average constant of d^{15} 0.9229; solidification point, —17°; color, brown; taste, bitter; n^{19} 1.4772; unsaponifiable, 4.0; acid no., 20; saponification no., 183; hydroxyl no., 7.8; iodine no., 107; N, 0.13%; and phospholipids, 2.84%. (*Chem. Abs.* **45**, 9895)

Paper chromatography in the fat field. IV. Radiometry of oleic acid. H. P. Kaufmann and J. Budwig (Chem. Landesuntersuchungsamt Nordrhein-Westfalen, Munster, Ger.). *Fette u. Seifen* **53**, 69-73(1951). The theory and application of radioactive isotopes are reviewed. Oleic acid can be determined by placing microdrops of a solution containing 24-72 γ oleic acid per drop on a sheet of filter paper, exposing the paper to NH_3 fumes in a closed vessel for 30 minutes, adding several drops of a reagent consisting of a 2.5% aqueous cupric acetate solution containing 1% of a $Co^{60}Cl_2$ solution having a radiation of 1 mc. per ml., washing the paper with water, drying, cutting out the spots containing the Co oleate, and measuring the radiation with a Geiger-Muller counter.

VI. Application to soaps. H. P. Kaufmann, J. Budwig and E. Duddek. *Ibid.* 285-288. Soaps are best hydrolyzed with HCl vapors after applying them to the paper. The inorganic salts are then removed with water. Information is given for separating the fat acids. (*Chem. Abs.* **45**, 9893)

Aniline point of some fats. J. G. Kane and G. M. Ranadive (Univ. Bombay). *J. Sci. Ind. Research* (India) **10B**, 62-6 (1951). The aniline points of common edible fats like groundnut, sesame, cottonseed, and coconut are considerably increased in the presence of white oils, the increase being approximately proportional to the amount of white oil present. Free fatty acids and rancidity lower the aniline point of a fat; moisture increases it. It is possible to estimate the amount of mineral oil in an edible fat within 1 to 2% by using these relationships. The aniline points of some neutral fatty oils are: groundnut oil, 16.8°; sesame oil, 12.2°; cottonseed oil, 5.9°; coconut oil, 3.8°. Increase in unsaturation or decrease in molecular weight causes a decrease in aniline point, as does the hydroxyl group. (*Chem. Abs.* **45**, 9893)

Fat determinations in milk and milk products. L. Gershenfeld and M. H. Rosenthal (Philadelphia Coll. of Pharm. and Sci., Philadelphia, Pa.). *J. Milk Food Technol.* **14**, 17-18(1951). A method is given, using various anionic and nonionic detergent combinations for determining the fat content of milk (raw, pasteurized, plain, or homogenized), buttermilk, chocolate milk, skim milk, butter, cream, ice cream, and sour cream. The proper quantity of sample is mixed with the nonionic detergent (e.g., Tween 20 or Triton A-20) to which is then added the anionic detergent (e.g., Tergitol 4T). The mixture is then washed into a Babcock test bottle which is placed in a boiling water bath. After 5 minutes in this bath, the test bottle is removed and hot water added to bring the fat column to the graduated neck of the bottle. A single solution consisting of Tween 40 and Tergitol 4 or Tergitol P-28 was the only mixture of nonionic and anionic detergent that was satisfactory. The test in all mixtures was accurate, easy to perform, and required no extensive laboratory equipment. All findings were compared and agreed in every instance with the official Babcock technique, the Schain method, and the Gershenfeld and Ucko modification of the Schain method. (*Chem. Abs.* **45**, 9768)

Relation between acid number of cream and off-taste of butter. F. Munin. *Fette u. Seifen* **53**, 46-7(1951). Laboratory acidification of cream resulted in metallic and oily butter taste. Water-soluble antioxidants prevented this. Butter made from cream where the surface layer of the fat particles had been removed by washing with water developed no oily taste on storage. (*Chem. Abs.* **45**, 9763)

Stability of the double bond in oleic acid and oleyl alcohol (in vivo). K. Bernhard and U. Gloor (Univ. Basel, Switz.). *Helv. Physiol. et Pharmacol. Acta* **9**, C17-18(1951). When azelaic acid labeled with D was fed to dogs or human subjects it was all recovered in the urine. No evidence was found that any azelaic acid is formed in the body from oleic acid by oxidative fission at the double bond. No azelaic acid was formed from oleyl alcohol and its acetate and benzoate when fed to dogs. (*Chem. Abs.* **45**, 9669)

Fungistatic activity of fat acids of short and medium chain length against pathogenic yeasts. W. Haensel and A. Szakall. *Fette u. Seifen* **53**, 337-8(1951). Fat acids of medium chain length were esterified with the corresponding alcohols. The resulting esters had no appreciable action on *Endomyces dermatitidis in vitro* but had excellent penetrating properties and good therapeutic properties *in vivo*. Fatty acids as low as C_6 could be used. (*Chem. Abs.* **45**, 9609)

Dehydration of ricinoleic acid, its esters, and its glycerides. P. Desnuelle and R. Massoni. *Bull. soc. chim. France* **1950**, 1180-5. Analytical methods used for the determination of OH groups, dienic content, degree of unsaturation in the presence of conjugated systems, and of linoleic and isolinoleic acids are discussed in detail. Castor oil was dehydrated at 220-40° with 0.5-5.0% $KHSO_4$, P_2O_5, and p-$CH_3C_6H_4SO_3H$ as catalyst, and the final products were identified. Ricinoleic acid and its methyl ester were dehydrated with $KHSO_4$ at 250-80° (the latter temperature is preferred). Numerous curves and tables are shown. (*Chem. Abs.* **45**, 9475)

Lecithin and oxidized flavor in milk and butter. S. Hartmann. *Proc. 11th Intern. Congr. Pure and Applied Chem., London 1947* **3**, 93-6(1951). The oxidation of lecithins, the process responsible for the oxidized flavor in milk and butter, is effected by several oxidation-reduction systems involving heavy metals, ascorbic acid, and flavoproteins. The oxidizing effect of ascorbic acid is due to the fact that other oxidation-reduction systems such as Cu^{+}, $—Cu^{++}$, or ascorbic acid oxidase transfer ascorbic acid to dehydroascorbic acid. This system is most important in bringing out the oxidized flavor in milk. Ascorbic acid and heavy metals exert an oxidizing effect on lecithins as shown by manometric measurement of O absorption. A decrease in the content of ascorbic acid in milk is an indicator of heavy metal catalysis. The enzyme ascorbic acid oxidase influences the oxidizing effect of ascorbic acid on lecithins as does Cu. When ascorbic acid is added to butter, the peroxide value is unaltered; this indicates that the fatty acids are not oxidized appreciably. Graphs are shown indicating the result of adding Cu-binding substances to lecithins. The addition of 8-hydroxyquinoline, e.g., completely blocks oxidation, although its toxicity limits use. (*Chem. Abs.* **45**, 9763)

Continuous extractors. R. Christiansen. *Fette u. Seifen* **53**, 99-101(1951). A review of the apparatus used in industrial extraction of solids with liquids. (*Chem. Abs.* **45**, 9309)

The titrimetric determination of plasma fatty acids. E. Page and Loraine Michaud (Univ. Laval, Quebec). *Can. J. Med. Sci.* **29**, 239(1951). A method is described for the determination of total fatty acids in small amounts of blood plasma. The plasma lipids are extracted in an alcohol-acetone mixture. Following saponification and hydrolysis, the fatty acids from an aliquot of their benzene solution are dissolved in alcoholic thymol blue and titrated with tetramethyl ammonium hydroxide.

Britain's oil and fat position. C. G. Hewood. *Soybean Digest* **11**(11), 55(1951). The United Kingdom has always been a large importer of fats. Every effort is being made to increase fat production within the Empire due to the dollar shortage.

World fat and oil supplies and American soybeans. P. E. Quintus (Office Foreign Agr. Relations). *Soybean Digest* **11**(11), 38(1951). The importance of our soybean and soybean oil exports are assayed in light of the current world fat and oil situation.

High quality fatty acids from continuous distillation unit. H. N. Acker. *Can Chem. Proc.* **35**, 716(1951). Description of a new unit recently installed at London, Ontario.

A tailor-made raw product. S. W. Schwartzman (Armour Res. Found.). *The Frontier* Sept. **1951**, 10. The possibility of production of fats or fatty acids by submerged culture of microorganisms is discussed.

World oils and fats shortage diminishing. J. A. Faure. *Oils and Oilseeds J.* **4**(2), 6(1951). If the U. S. oil production should be as large as the present optimistic crop reports indicate and if olive oil production is about normal, the postwar shortage of oils and fats should be largely overcome.

Recent developments of oil crushing industry in India and abroad. S. M. Sudarsanam. *Oils and Oilseeds J.* **4**(2), 14 (1951). A brief report of the equipment used by the European oil crushing industry. The effect of India's prohibition of exports of oil seeds is discussed.

Studies on oxidized milk fat. I. Observations on the chemical properties of the volatile flavor material from oxidized milk fat. M. Keeney and F. J. Doan (Penna. Agr. Exp. Station, State College). *J. Dairy Science* **34**, 713(1951). Vacuum distillation of oxidized milk fat yielded material with the characteristic flavor and odor of oxidized fat. The carbonyl compounds were shown to be the chief contributors to the characteristic odor of oxidized fat. The addition of the volatile neutral material to milk was capable of imparting an oxidized flavor to milk when present in concentrations of less than 1 ppm. A compound was isolated from the volatile neutral fraction with an empirical formula of $C_9H_{16}O$. It was apparently an α,β-unsaturated ketone with the O in the 3, 4, or 5 position.

II. Preparation of 2,4-dinitrophenylhydrazones from the volatile material from oxidized milk fat. *Ibid.*, 719. The volatile neutral material from oxidized milk fat contained carbonyl compounds of the following empirical formulae: $C_3H_{4-6}O_2$, $C_7H_{12}O$, $C_9H_{16}O$, $C_{12}H_{20-22}O$. The first compound was probably 2-hydroxypropanal. The C_7 and C_9 compounds were unsaturated ketones with the former containing an isolated double bond, while the latter was an α,β-unsaturated ketone. The C_{12} compound was an α,β-unsaturated carbonyl compound.

III. Chemical and organoleptic properties of volatile material obtained by fractionation with various solvents and Girard's reagent. *Ibid.*, 728. The predominant odor compounds from oxidized milk fat were ketones. None of these ketones were methyl ketones and a large portion of them were unsaturated. It has been shown that in the advanced stages of milk fat oxidation it is possible to isolate flavor fractions which are typical of earlier stages in the oxidation.

Body composition of cattle. I. Estimation of body fat from measurement in vivo of body water by use of antipyrine. H. F. Kraybill, O. G. Hankins and H. L. Bitter (Bur. Animal Ind., U. S. Dept. Agr., Beltsville, Md.). *J. Applied Physiol.* **3**, 681-9 (1951). Body water measurements were made on 30 beef cattle, consisting of steers, heifers, and cows varying widely in age, weight, and composition by a modified antipyrine method. The body water content ranged from 43.9 to 63.3%, corresponding to a range in body fat of 13.9 to 40.1%. The body water values agreed closely with those calculated from sp. gr. and body fat values agreed with those determined by analysis of carcass samples. A sex difference in fat and water content was demonstrable in a group of Hereford cattle on a high plane of nutrition. The heifers averaged 32.5% fat and 49.4% water, whereas the steers averaged 27.5% and 53.1% within the same weight and age range. (*Chem. Abs.* **45**, 8072)

Unsaturated fatty acids and oncogenous hydrocarbons. W. Ciusa and G. Nebbia. *Acta Vitaminol.* **5**, 20-2(1951). A review, with 23 references, suggests a connection between unsaturated fatty acids in the diet and the oxidation of oncogenous hydrocarbons to harmless products. (*Chem. Abs.* **45**, 8098)

Constituents of the ovaries of globefish. II. Steroids that constitute the fatty oil (1). K. Tsuda and B. Umezawa (Univ. Tokyo). *J. Pharm. Soc. Japan* **71**, 273-8(1951). The ovaries contained about 30% oil; 3 kg. of the oil gave 130 g. of unsaponifiable substance. Unsaponifiable substance contains, beside cholesterol, a new substance, $C_{30}H_{46}O_2$, m. 115-16°, belonging to the steroid or triterpenoid series.

III. Fatty acids that compose the fatty oil (1). K. Tsuda and H. Shan-Hai. *Ibid.* 279-82. The saponified portion of the oil gives palmitic, stearic, oleic, and linoleic acids of which the content of saturated and unsaturated fat acids are about equal. (*Chem. Abs.* **45**, 8150)

The amounts and properties of the glycerides present in milk fat. M. Karsnitskaya (Timirjasev Agr. Acad., Moscow). *Molochnaya Prom.* **9**, No. 5, 22-3(1948); *Chem. Zentr.* (Russian Zone Ed.) **1949, I,** 546. The milk fat used for these tests was obtained from sweet-cream butter by warming the latter to 50°, filtering, and dissolving in acetone. By slowly cooling this liquid to —15° three fractions were obtained: I (14%) from 20 to 6°, m. 53.9-60.2°; II (21%) from 0 to —5°, m. 27.7°; and III (65%) obtained by distilling off the acetone, solidifying 6.1°. The following values are reported for fractions I, II, and III, in order: saponification no. 207, 222, 229; Polenske no. 1.7, 2.1, 3.9; iodine no. 11.0, 24.0, 43.4. (*Chem. Abs.* **45**, 8159)

Oxidation of milk fats and action of antioxidants. E. Giacoboni-Vercesi. *Mondo latte* **1951**, 208, 211, 213-4, 217(1951). A lecture on the chemistry of oxidation of milk fats, its inhibition by antioxidants, and methods for the determination of the oxidation degree. (*Chem. Abs.* **45**, 8159)

New methods of fat analysis. H. P. Kaufmann (Chem. Landesunter-suchungsamt Nordrhein-Westfalen, Ger.). *Fette u. Seifen* **52**, 713-21(1950). Identification of traces of fats and fat acids by paper chromatography: (1) The foam test can be used. (2) Use of fat-soluble dyes; rhodamine gives a green fluorescence under ultraviolet light with 1 γ oleic acid or linoleic acid. (3) Unsaturated glycerides and fat acids give a gray color on filter paper exposed to OsO_4 vapors; the test is sensitive to 5 γ oleic acid or 2.5 γ linoleic acid. Work on a quantitative method is in progress. (4) When filter paper containing fat acids is pulled quickly through alkaline $KMnO_4$ solution, the unsaturated acids discolor the $KMnO_4$ at once; the test is sensitive to 1 γ oleic acid. (5) The formation of colored metal salts is useful in the identification of fatty acids and their soaps. Contrasting colors may be used to make spots more visible and several reactions may be carried out on the same paper. The determinations of fats and fatty acids on paper by frontal and planimetric methods is discussed. Separations of fatty acids, glycerides, and mixtures can be carried out on paper. For the determination of the iodine no. on paper, the paper is first impregnated with a dye which is decolorized by Br, e.g. indigo carmine. Drops of the oils to be analyzed are then placed on the paper and 0.02 *N* Br in methanol saturated with NaBr is allowed to rise up the paper. The Br removes all color except in areas just above the oil drops. The size of these areas varies with the iodine no. of the oil. Radiometry can be applied to paper chromatography of fatty acids; Co^{60} soaps can be used. (*Chem. Abs.* **45**, 8271)

Distillate obtained during the manufacture of factice from castor oil. T. R. Sharma, M. Prasad, R. Prakash and Om Prakash (H. B. Technol. Inst., Kanpur). *Proc. Ann. Convention Oil Technol. Assoc. India* 3, 31-8(1948). This product which is about 2% of the original oil contains fatty acids 45, aldehydes and ketones 7, and residual oil 40%. (Chem. Abs. **45**, 8272)

Chemical study of the seed kernels of Prunus armeniaca (bitter apricots). I. Component fatty acids of its fixed oil. D. R. Dhingra and U. K. Shukla (H. B. Technol. Inst., U. P. Cawnpore, India). *Proc. Ann. Convention Oil Technol. Assoc. India* **3**, 2-6(1947). India bitter apricot seed yielded 28% kernels of moisture 5.56 and oil 40.39%. The character of the oil was: color light pale, odor pleasant, taste pleasant, n^{36} 1.46375, d^{36} 0.9204, acid no. 7, saponification no. 192, saponification equivalent 292, iodine no. 99. The acid components were: myristic 2.69, palmitic 4.40, stearic 1.12, arachidic 0.50, oleic 68.42, and linoleic 21.69%; the unsaponifiable matter was 1.38%. A cost analysis of processing indicated that it could be produced at a profit. The oil is edible. (*Chem. Abs.* **45**, 8273)

Alkali refining of oils—groundnut and til oils. A. Ram, Om Prakash and D. Y. Athawale (H. B. Technol. Inst., Cawnpore). *Proc. Ann. Convention Oil Technol. Assoc. India* **3**, 25-33(1947). Optimum conditions for refining peanut oils of acid nos. 2.5, 6.0, and 9.0, and sesame oil (til oil) of acid no. 2.3, respectively, were temperature 60, 60, 60, and 50°, and alkali strength 10, 15, 25, and 25%. (*Chem. Abs.* **45**, 8273)

National olive oils. III. Chemical composition of the fatty acids of oils from olive residues. P. Cattaneo, G. K. de Sutton and J. Rodriguez. *Anales asoc. quim. argentina* **38**, 383-400 (1950). Olive residues from cold expression were extracted with petroleum ether, the oil saponified, and the fatty acids separated by distillation of their methyl esters. A refined commercial oil was investigated. The results were (as % of total acids): myristic acid 0.7, palmitic 13.8, stearic 1.4, saturated acids C_{20}-C_{30} 0.9, palmitoleic 1.5, oleic 65.1, and unsaturated acids higher than C_{18} 1.1. (*Chem. Abs.* **45**, 8274)

Rohini seed and its oil. D. Bhushan, A. Ram and Om Prakash (Singh Eng. Works, Ltd., Kanpur). *Proc. Ann. Convention Oil Technol. Assoc. India* **5**, 39-43(1949). Oil from Rohini seed *(Mallotus phillipinensis)* is a drying oil and has the following characteristics: sp. gr. 0.9444, saponification no. 190, iodine no. (Wijs) 166, maleic anhydride no. 49, acid no. 5.16, Hehner no. 96.4, unsaponifiable matter 2.3%, m.p. (capillary method) 54.2°, and titre 49.5°. The oil cake is fairly rich in N and should form a good fertilizer. (*Chem. Abs.* **45**, 8274)

Extraction of oil from the by-products of wheat milling. Products obtained and their eventual utilization. S. Anselmi. *Rend ist. super. sanita* **7**, 466-89(1944). A large-scale trial of the extraction of wheat bran by CS_2 has been carried out with a plant designed for the extraction of olive marc. Of the 4% of oil originally present in the bran about 3% was extracted. The separated oil was dark in color with a disagreeable odor and contained 0.88% of water. Analysis of the extracted oil was as follows: unsaponifiable 4.3%, d^{15} 0.9299, n^{25} 1.4805, acid no. 54, saponification no. 188, and iodine no. 118. Normal refining methods offered prospects of producing an edible oil. Hydrogenation of the oil (Ni catalyst at 220°) was unsuccessful (*Chem. Abs.* **45**, 8274)

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Treatment of glyceride oils. S. E. Freeman (Pitts. Plate Glass Co.). *U. S. 2,573,896. The furfural extract of glyceride oils is* extracted with a liquid paraffin hydrocarbon to remove the glycerides therefrom. The furfural raffinate is then saponified and the unsaponifiables extracted with a petroleum hydrocarbon.

Solvent extraction of vitamin A from fish liver oil. S. E. Freeman and S. W. Gloyer (Pitts. Plate Glass Co.). *U. S. 2,573,897.* Fish liver oil is countercurrently contacted with an organic polar solvent which is partially miscible therewith in a vertical extractor, the top portion of which is at a substantially higher temperature than the lower portion. The cool extract is highly enriched in vitamin A.

Separation of tall oil components. R. M. Christenson and R. E. Harpt (Pitts. Plate Glass Co.). *U. S. 2,573,890.* The fatty acids in tall oil are esterified with a lower aliphatic alcohol and the remaining rosin acids neutralized with NaOH. This material is then made up into a solution containing 25-62% solids, 7-6% lower alcohol and 15-70% water and one volume of this solution countercurrently extracted with 1-20 volumes of naphtha. The extract contains the fatty acid esters, the rosin soaps are in the alcohol-water phase.

Recovery of sterols. R. M. Christenson (Pitts. Plate Glass Co.). *U. S. 2,573,891.* The acidified soap from a glyceride oil containing sterols is thoroughly water washed and then intimately commingled with a system of a polar and non-polar solvent which is not completely miscible. On separation of the two layers the polar solvent contains fatty acids of a relatively high degree of unsaturation and a small quantity of sterols while the non-polar phase is relatively rich in the more saturated fatty acids enriched in sterols. Crystallization of most of the fatty acids from the raffinate phase provides a sterol concentrate.

Treatment of glyceride oils. S. E. Freeman (Pitts. Plate Glass Co.). *U. S. 2,573,900.* The furfural extract of a glyceride oil is concentrated and extracted with naphtha. Or a liquid aliphatic hydrocarbon may be introduced into a furfural extraction column at a point below the oil inlet. The presence of the naphtha tends to remove from the extract the relatively more saturated glycerides.

Solvent concentration of vitamins. S. W. Gloyer (Pitts. Plate Glass Co.). *U. S. 2,573,902.* A vitamin A containing oil is countercurrently extracted with furfural in a column into which naphtha is introduced near the bottom. The extract phase contains unsaturated glycerides, *free fatty acids and vitamin* A. This extract is countercurrently contacted in another extraction zone with naphtha which removes the glyceride oil and vitamin A leaving the fatty acids in the polar solvent.

Acyl ureide preparation. E. W. Eckey and A. D. Abbott (Procter & Gamble Co.). *U. S. 2,574,864.* Acyl ureides are formed by contacting a fatty acid ester of an aliphatic polyhydric alcohol with urea in the presence of less than 5% sodium methoxide. The temperature of the reaction (always below 150°) is such that progressive crystallization of the fatty acid ureide takes place.

Process for purifying oil by distillation. C. J. Egger and R. W. Webster (The Buckeye Labs. Corp.). *U. S. 2,575,051.* Oil contaminated with a substance boiling considerably below the boiling point of the oil may be purified by spraying it at elevated temperature into an evacuated chamber and removing the contaminents overhead. Apparatus for carrying out this process without overheating the oil is described.

Method of separating fatty acids. L. D. Myers (Emery Industries, Inc.). *U. S. 2,575,526.* A method of separating fatty acids is claimed which consists of preparing the fatty amides, dissolving the amides in a solvent, reducing the temperature to precipitate part of the dissolved amides, separating the precipitated amides from the dissolved amides, and converting the amides into the corresponding fatty acids.

Fat splitting agent and method of producing same. W. K. Griesinger (Atlantic Refining Co.). *U. S. 2,575,807.* An agent for hydrolyzing fats is disclosed which comprises a mixture of sulfuric acid of 80-85% concentration and sulfonic acids of a polyalkylated benzene fraction boiling between 400 and 550° F. The polyalkylated benzene is made by reacting benzene and propylene in the presence of a phosphoric acid catalyst at 400-500°F. under a pressure of 200-400 psi.

Solvent fractionation. W. M. Leaders and F. E. Lacey (Swift & Co.). *U. S. 2,576,841.* A process for the treatment of fatty materials containing relatively saturated and unsaturated constituents to obtain an improved separation of the highly unsaturated constituents is disclosed which comprises fractionally crystallizing the more saturated materials from a propane solution held at a temperature between 30° and —70°F.

Emulsification of fats. H. Tsuchikawa and K. Nishimura. *Japanese 179,024.* Fats and oils are polymerized while the deodorization process is in progress and then emulsified in gelatin. (*Chem. Abs.* **45,** 9900)

Acid-decreasing process of fats and oils. M. Hazama (Oriental Chemical Co.). *Japanese 179,338.* Fats and oils having a high acid no. are mixed with mono- or diglycerides and heated above 200° where esterification decreases the acid no. to less than 8. (*Chem. Abs.* **45,** 9900)

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• Biology and Nutrition

R. A. Reiners, Abstractor

Reproductive failure of rats on glyceryl trilaurate-containing diets and its prevention by certain natural fats. K. W. Keane, Eva M. Cohn and B. C. Johnson (Univ. Illinois, Urbana). *J. Nutrition* **45,** 275(1951). Female rats fed a diet containing glyceryl trilaurate plus methyl linoleate as a fat source were unable to rear their young to weaning age. When this diet was supplemented with 2.5% wheat germ oil, the young were raised successfully. It appears that there is in wheat germ oil and other natural fats (corn oil) an unidentified factor which is necessary to permit the female rat to rear her young.

Technical aspects of research on the amino acid composition of oil cake. J. Roche and R. Michel. *Oleagineux* **3,** 192-6(1948). The importance of a knowledge of the amino acid composition of proteins of oil cake is emphasized. Methods of determining the proportions of various acids are summarized. (*Chem. Abs.* **45,** 9282)

The utilization of butyric acid for the synthesis of cholesterol and fatty acids. I. Zabin and K. Bloch (Univ. Chicago). *J. Biol. Chem.* **192,** 26(1951). The formation of acetoacetate in rat liver slices, and of cholesterol and of fatty acids in the intact animal, have been studied with butyric acid-1-C^{13} 3-C^{14}. The ratios of the 2 carbon isotopes in the metabolic products were significantly different from 1.0 showing that the breakdown of butyrate yields fragments of different reactivity. Results from incubation of rat liver slices indicate that the terminal fragment of the butyrate furnished a larger portion of the total acetoacetate carbons than did the fragment comprising carbon atoms 1 and 2 of the fatty acid. Similar results were obtained in animal studies.

Spectrophotometric determination of vitamin A. A. Mariani and A. Gaudiano (Ist super. sanita, Rome). *Rend ist. super. sanita* (Rome) **13,** 632-58(1950). The method of correction for extraneous adsorption was improved by an interpolation technique. For vitamin A acetate, the Morton-Stubbs correction is adequate; for vitamin A alcohol other corrections are proposed. (*Chem. Abs.* **45,** 9588)

The vitamin A potency of fresh and of stored butter made from sweet and from neutralized sour cream. J. L. Brence and J. A. Nelson (Montana Agr. Exp. Station, Bozeman). *J. Dairy Sci.* **34,** 949(1951). The vitamin A potency of fresh butters made from the same creams was the same whether the butter was made from fresh cream or cream standardized with different commercial neutralizers and stored for various lengths of time. The acidity of the cream at churning did not affect the vitamin A potency either.

The so-called factor with vitamin A activity from lard distillate of Kaunitz and Slanetz. Chr. Engel (Centr. Inst. Voedingsonderzoek T. N. O. Utrecht, Netherlands). *Voeding* **12,** 310-12(1951). Experiments with rats on a diet containing fresh lard (10%) showed no vitamin A activity whatever. This is in complete contrast to the observations of Kaunitz, *et al.* (*Chem. Abs.* **45,** 9654)

Proof of the early utilization of fat administered intravenously into human subjects. B. G. P. Shafiroff, J. H. Mulholland and J. Baker (New York Univ. Coll. of Med., New York). *Exptl. Med. Surg.* **9,** 180-84(1951). An unsaturated triglyceride of linoleic acid was reduced with D to yield deutero-tristearic acid containing about 5 atom % D. Experiments with this tagged fat in emulsified form, given intravenously to human subjects, showed that it was in part rapidly oxidized with resultant detachment of the D from its bonds. (*Chem. Abs.* **45,** 9658)

A comparison of the vitamin A potency of milk fat from cows fed on dry feed and on green pasture. J. L. Brence and J. A. Nelson (Montana Agr. Exp. Station, Bozeman). *J. Dairy Sci.* **34,** 960(1951). The average vitamin A potency was generally higher during the period when the cows were on green pasture than when the cows were getting all dry feed. However, in some cases the highest vitamin A potency was found in milk fat when the cows were on dry feed entirely, indicating that under some dry feeding conditions milk of high vitamin A potency can be produced.

Methods for determining the fat content of milk. III. The correction of the figures found by the Gerber method. L. Radema and H. Mulder. *Neth. Milk & Dairy J.* **5,** 104-109(1951). A milk pipette having a 10.77-ml. capacity is used in place of a 11-ml. pipette in the Gerber method in order to obtain the same results for the fat content of milk as is obtained by the Rose Gottlieb method.

Biological experiments on the vitamin activity of a carotenoid extract from palm oil. J. Blaizot. *Oléagineux* **5,** 634-638(1950). A carotenoid extract obtained from palm-oil was compared with that of pure vitamin A by comparing their effect on the weight and ophthalmic symptoms of rats.

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• Drying Oils

Stuart A. Harrison, Abstractor

Thermal polymerization of esters of unsaturated fatty acids. D. H. Wheeler. *Official Digest Federation Paint and Varnish Production Clubs,* **No. 322,** 661(1951). Pure methyl esters of isomeric linoleic and linolenic acids were thermally polymerized for various periods of times at several temperatures. The products were analyzed for monomer, dimer, and trimer. The monomer was also analyzed by ultraviolet and infrared spectroscopy as well as the usual methods of fatty ester analysis. The following non-conjugated isomers were studied: normal cis-9, cis-12 linoleate, trans-9, trans-12 linoleate, and cis-9, trans-12 linoleate. The dimerization in each case involves first the conjugation of the double bonds to give a conjugated diene ester; this combines largely with a non-conjugated linoleate through a Diels-Alder addition, in which one of the non-conjugated double bonds acts as a dienophile. Trimer is probably formed by the conjugated diene reacting with a double bond of the dimer. The presence of a fairly low but constant concentration of conjugated linoleate in the reaction mixture, rate studies on mixtures of conjugated and non-conjugated linoleates, and detailed kinetic studies support this picture. Two conjugated linoleate esters, the trans-10, trans-12 conjugated linoleate and the cis, trans (alkali conjugated) linoleates were polymerized and studied. The alkali conjugated diene ester polymerizes about six times as rapidly as the non-conjugated isomers; however, it polymerizes only about one-fifth as fast as the trans, trans isomers. The conclusion based on this evidence and examination of molecular models of the isomers is that the trans, trans, conjugated isomer is the more reactive diene in the Diels-Alder reaction. The isomeric non-conjugated and conjugated linolenate methyl esters were also studied in the same manner. The conclusions are that they follow the same pattern. The rate, however, is much faster for the conjugated triene isomers. The relative rates for the different esters are given.

Molecule enlargement in the fat field. V. Effects of catalysts on the drying of oils. H. P. Kaufmann and K. Strüber. *Fette u. Seifen* **53**, 142 (1951). The drying of oils depends to a large extent on natural impurities. These may act as positive or negative catalysts; most appear to be inhibitors. The mechanism of the drying reaction is also influenced by these catalysts, particularly in the case of conjugated-unsaturated fat acids. Oils containing the latter may form films both by autoxidation and by diene synthesis; the ratio of the two reactions depends on the nature and amount of catalysts present. The nature of the film formed is also dependent on these substances. (*Chem. Abs.* **45**, 9890)

Dehydration and polymerization of castor oil. Its applications. M. Jordao da Rosa. *Olearia* **5**, 232-237(1951). The dehydration of castor oil by a thermal treatment was studied in an effort to produce a paint oil. The effect of several driers on these oils was also investigated.

Changes in the infrared spectra of some synthetic oils as a function of drying time. I. Adams, R. W. Auxier, and C. E. Wilson. *Official Digest Federation Paint and Varnish Production Clubs.* **No.** 322, 669(1951). Films of the following oils were drawn at .0015" thickness on rock salt slabs: dipentaerythritol stearate, oleate, linoleate and linolenate. The films were examined periodically by infrared during the drying period. There was little change in the absorption spectrum of the stearate and oleate. In the case of the linoleate and linolenate esters, however, there was a distinct change with time. There was a constant increase in a band at 2.78-2.83 μ which corresponds to a hydroperoxide and a decrease at 3.27 μ which was interpreted as a carbon to hydrogen bond adjacent to a double bond. This supports the mechanism of hydroperoxide formation, at carbons α to double bonds, during drying which was proposed by Farmer.

Undercoats and primers based on alkyd resins. L. Angelino. *Ind. vernice* (Milan) 2, 291(1948). Principles of their formulation are discussed; in general there should be at least one part of resin for every 2.5 parts of other non-volatile material in the paint. Formulas are given for some anticorrosive and white primers. (*Chem. Abs.* **45**, 9278)

Utilization of tobacco-seed and safflower-seed oils in varnishes and paints. I. P. G. Sharma, N. C. Budhraja, and J. S. Aggarwal. *J. Sci. Ind. Research* (India) **10B**, 33(1951). Stand oils prepared from raw tobacco and safflowerseed oils were similar to the corresponding linseed-oil products. The physical and chemical properties of the products obtained by heating the oils with resorcinol and sodium bisulfite are given. Isomerization was tried in the presence of anthraquinone, Ni-C catalyst, and activated silica; modified oils having good drying properties were obtained with the first two. Varnishes of medium oil range with ester gum made from the treated oil were similar to the corresponding linseed-oil varnishes. White paints with TiO_2 gave films similar to those with linseed-oil paints, but the color retention was better. Cobalt driers were found to be better than manganese or lead driers. (*Chem. Abs.* **45**, 9278)

Varnishes based on oiticica oil. P. A. Letts. *Ind. vernice* (Milan) 2, 295(1948). The gelation time of Cicoil (permanently liquid oiticica oil) alone and in admixture (70:30) with modified phenolic or maleic resins of high or low softening points passes through a minimum for a temperature of 280-90°. With a pure oil reactive phenolic resin the gelation time falls as the temperature rises up to 320°. In general the three types of resins mentioned give the best varnishes with Cicoil, but the cooking temperature should not exceed 250-260°. Where the resin is of low viscosity or where the oil length of the varnish is long, it is advisable to body the oil alone or with a little resin for some time before adding the bulk of the resin. The addition of metal oxides should be avoided during cooking since they induce foaming. Several varnish formulas are given. (*Chem. Abs.* **45**, 9277)

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Unsaturated oil-soluble copolymers. T. P. Malinowski. *U. S. 2,561,313.* A copolymer of alpha-methyl styrene (236 parts) and maleic anhydride (49 parts) is made in 6 hours at 60° using 6 parts of Fuller's earth. After heating to 150° in toluene for 10 minutes, filtration and removal of toluene, an oil soluble resin remains. A mixture of 100 parts of this resin and 150 parts of dehydrated castor oil are heated to 280° for 30 minutes. The product with drier forms tough films in 30 minutes at 135°.

Addition products of esters comprising a polyhydric alcohol esterified with drying oil acids and an alkenol-dicarboxylic acid monoester and process of making same. J. B. Rust, *U. S. 2,570,385.* A rapid drying modified oil is prepared through the following procedure: 300 parts of linseed fatty acids and 48 parts of glycerol are heated at 200-240° in an inert atmosphere for about 10 hours (acid no. = 5). Then 65.4 parts of mono-allyl maleate and 2.067 parts of p-toluene sulfonic acid are added and heating continued at 120-180° for about 12 hours. Acid number at end is about 15. This oil (135 parts) and 15 parts of diallyl maleate are heated together in the presence of 0.2 part of benzoyl peroxide in an inert atmosphere at 160-180° for 1¾ hours. With drier, films of the oil dry dust-free in one hour and tack-free in 3¾ hours. Other fast drying oils can be prepared by using other polymerizable diethyl esters, styrene, vinyl acetate and other polymerizable compounds, in the last step.

Copolymerization of conjugated drying oils and acids with polymerizable unsaturated compounds. C. J. Opp and R. E. Werner. *U. S. 2,574,753.* Drying oils or their fatty acids are heated to 100-250° with styrene, a peroxide catalyst and an alkyl mercaptan. A clear product is obtained containing a large proportion of polymerized or copolymerized styrene. It is preferable that the oils or fatty acids have conjugated unsaturation, e.g., styrene (250 pts.) containing one per cent of a C_{12} tertiary mercaptan, 750 parts of dehydrated castor oil and 5 parts of benzoyl peroxide were heated under reflux and with agitation to 150° for six hours. The product was a clear, viscous, homogeneous oil in which 62% of the styrene had polymerized. Such an oil is suitable for a coating material.

• Detergents

Lenore Petchaft, Abstractor

Transparent soaps. S. N. Sethumadhava Rao. *Soap, Perfumery, Cosmetics* **24**, 1099-1103(1951). Review of chemistry, theory and preparation of transparent soaps. At one time it was thought that the transparent soaps were not of a crystalline nature, but now it has been shown that they consist of crystals of ultramicroscopic dimensions. Transparent soaps usually contain crystallization retarders such as alcohol, glycerol, sugar, KCl or certain rosin soaps. Retarders may act either by exerting solvent action on the soap or simply by retarding rapid crystal growth. Other protransparency factors include rate of cooling (rapid cooling promotes clear soaps), proper balance of saturated and unsaturated fatty acids, purity and viscosity of the alcoholic soap solution, proper dessication and the factor of shock or physical strain. Other important considerations discussed include selection of suitable raw materials, proper choice of solvent, color and perfume, proper formulation, completeness of saponification, molding and storage.

A simple method of measuring the moment of disappearance of soap micelles during polymerization in emulsion. K. H. Klaassens, J. Bakker, C. J. Schoot and J. Goorissen. (Philips Research Laboratories, Eindhoven, Netherlands). *J. Polymer Sci.* **7**, 457-61(1951). A simple method is described for determining the moment of disappearance of soap micelles during the emulsion polymerization of styrene by measuring the electrolytic conductivity during the polymerization. The method has been investigated for the polymerization in emulsion of styrene with the potassium salt of stearic acid as a soap and potassium persulfate as an initiator. The time required for disappearance of the soap micelles decreases with increasing soap concentrations and also with increasing catalyst concentrations.

New additives for soap. P. I. Smith. *Am. Perfumer Essent. Oil Rev.* **58**, 367-9(1951). Review of new chemicals that are being used in soap to prevent deterioration, improve stability and reduce color bodies in oils and fats. These include the polyamines, e.g. diethylene triamine, etc., which prevent rancidity in soaps, propyl gallate and Tenox which are efficient antioxidants and sodium dithionite useful in improving the color of soaps made from bleached fats.

Sodium carboxymethyl cellulose as a detergent aid. F. J. Pollok (Imperial Chemical Industries, Ltd., Stevenston, Ayrshire, England). *Soap, Perfumery, Cosmetics* **24**, 991-5(1951). Extensive literature survey reviewing the use of SCMC in soap, washing powder, and synthetic detergents. 37 references.

Structure and role of wetting agents. IV. D. G. Dervichian and F. Lachampt. *Bull. soc. chim. France* **1951**, 289-94. The usual explanations of wetting, based exclusively on the conceptions of superficial tension and contact angle do not account for the essential details of the phenomenon. Wettability depends not only on the nature of the liquid but also on that of the surface being wetted. For a liquid to adhere to a surface, the free energy of adhesion must exceed that of cohesion. For a liquid to spread spontaneously on a surface, not only must the free energy of adhesion be great but also the molecules of the surface must be unorganized and mobile. The action of various wetting agents is explained. (*Chem. Abs.* **45**, 9900)

Alkyl sulphosuccinates. H. Stupel and A. von Segesser. *Textil.-Rund.* **6**, 255-68(1951). Data are given on the properties of alkyl sulphosuccinates, particularly the dioctyl, dihexyl, diamyl and diisobutyl compounds. The properties covered are solubility, surface tension, interfacial tension against oil, wetting times according to the Draves test, foaming power and stability of acids, alkaline and hard water.

Examination of detergent preparations. Society of Public Analysts and other Analytical Chemists, Analytical Methods Committee. *Analyst* **76**, 279-86(1951). Report of a subcommittee set up to consider whether standard methods of analysis of soapless detergents were possible. It is concluded that a method of quantitative determination suitable for all types is impracticable. A method is described for the qualitative examination of an unknown composition, to ascertain the type of detergent present, and detailed descriptions are given of quantitative methods which have proved satisfactory for the determination of total organic matter, anionic detergents, sulphated bodies, sulphonated bodies, non-ionic detergents, cationic detergents, and neutral and alkaline electrolytes.

New apparatus for the determination of foaming power. A. Schlachter and H. Dierkes (Farbenfabriken Bayer, Leverkusen, Ger.). *Fette u. Seifen* **53**, 207-9(1951). The apparatus consists of a cylinder of 55-mm. diameter and 200-cc. volumes placed inside, and connected with a cylinder of 115 mm. diameter with a volume of 1500 cc.; the connection is through a cylindrical screen of 50-mm. diameter which contains a conventional agitator. (*Chem. Abs.* **45**, 9899)

Volumetric method for the rapid determination of total fatty acids in soaps. Alfredo Bruno (Univ. Rome). *Ann. chim.* (Rome) **40**, 91-4(1950). The fatty acids are separated with dilute H_2SO_4 from aqueous soap solution in a special graduated flask (similar to a Babcock bottle) at 100°, and their volume is read directly in weight per cent of the original soap. (*Chem. Abs.* **45**, 9899)

Determination of anion-active colloid electrolytes with p-toluidine. H. Stupel and H. von Segesser (Seifenfabrick Hochdorf, Lucerne, Switz. *Fette u. Seifen* **53**, 260-4, 327-32 (1951). By using CCl_4 to separate the phases, the p-toluidine titration method can be applied to the determination of alkyl aryl sulfonates, alkyl sulfonates, and sec-alkyl sulfates. A factor must be determined for each compound by titrating a sample of known composition. Ethex must be used as the solvent in the cases of fat alcohol sulfates and fat acid condensates. (*Chem. Abs.* **45**, 9899)

Properties of laundering compositions containing both synthetic detergents and soap with or without (active) oxygen. O. Uhl. *Fette u. Seifen* **53**, 84-8(1951). The addition of 10-15% of a synthetic detergent to soap keeps any Ca soap formed in hard water well dispersed without affecting the foam appreciably. The addition of tylose increases detergency at soap concentrations below 0.3%; there is no effect at higher concentrations. For stain removal, a concentration of 0.005-0.007% active O is best. Incorporation of 7-8% $Na_4B_2O_7$ is suggested; this allows for O loss during storage. Phosphates increase the rate of O formation to a point where the fibers may be damaged without increasing laundering efficiency; the addition of Trilon prevents this. In the use of fluorescent dyes substantive to cotton, there is reached in the course of repeated launderings, a saturation point after which the amount of dye absorbed during a laundering is equal to the amount removed. (*Chem. Abs.* **45**, 9899)

A precision instrument for detergency studies. H. J. Wollner and G. S. Freeman (American Conditioning House, Inc., Boston, Mass.). *Am. Dyestuff Reptr.* **40**, 693-6(1951). The design of a new precision detergency measuring instrument is discussed. Design objectives are enumerated and method of of achieving them outlined. The concept of supplying action in the form of a sinusoidal oscillation and its utilization are discussed along with the prospects of determining the mathematical relationship between energy input and soil removal. Data are given indicating the high test precisions that the Deter-Meter detergency tester is capable of producing.

New liquid skin cleanser for workers exposed to mineral oil. L. N. Savidge and F. H. Tyrer (Research Dept., Port Sunlight, England). *Brit. J. Ind. Med.* **8**, 26-8(1951). The most effective hand cleanser was a powder containing 50% wood flour, 48% powdered soap and 2% borax. Liquid formulas which are also satisfactory are: (A) nonionic detergent (condensed polyethylene oxide type) 24, mineral oil (cosmetic grade, nonfluorescent in ultraviolet light) 10, commercial lauryl alcohol 5, isopropyl alcohol 10, cresol (optional) 2, soap (low titer) 8, and water 41%; (B) nonionic detergent (condensed polyethylene oxide type) 14.5, soap (low titer) 5, isopropyl alcohol 4, and water 76.5%. (*Chem. Abs.* **45**, 9898)

PATENTS

Process for the preparation of strongly lathering and purifying agents, shampoos and the like. P. B. H. M. Dobbelmann and J. van Loon (Dobbelman N. V.). *U. S. 2,571,689.* A strongly lathering washing agent for use in hard and sea water consists of a composition containing a water soluble salt of a sulfate ester containing a hydrocarbon having a secondary carbon atom and a water soluble salt of a rosin product.

Hard water detergent. P. B. H. M. Dobbelmann and S. H. Bertram (Dobbelman, N. V.). *U. S. 2,571,690.* A detergent composition for producing suds in hard water, comprising particles of a fatty acid soap, and a water soluble layer of an alkali metal fluoride covering the soap, the covering layer being adapted so as to dissolve in the water prior to the soap and to react with the cations in the water which cause its hardness, forming non-ionized compounds, thus preventing formation of insoluble soaps.

Centrifugal separation of kettle soap. J. W. Bodman, F. J. Squire and G. W. Busby (Lever Brothers Co.). *U. S. 2,572,102.* Manufacture of soap involving the rapid separation of kettle soap into neat soap and nigre which comprises conditioning a batch of saponified kettle soap by sufficient water to reduce the total fatty acid content, agitating to maintain the soap in a homogeneous condition, withdrawing a continuous stream of said conditioned soap, adding to the conditioned soap a continuous stream of electrolyte to further reduce the total fatty acid content, intimately mixing and agitating the soap and electrolyte at a temperature above 180°F., and centrifuging to separate the soap.

Detergent composition. J. C. Harris and M. Kosmin (Monsanto Chemical Co.). *U. S. 2,572,805.* A detergent composition which prevents the formation of grease balls during washing comprises a mixture of the condensation product of tall oil with ethylene oxide in combination with a condensation product of an aliphatic mercaptan and ethylene oxide.

Fine non-coherent powders containing surface-active substances. N. V. de Bataafsche Petroleum Maatschappij. *British 685,616.* Dry surface active substances which are secondary sulfuric acid alkyl ester salts or mixtures thereof are mixed with water soluble inorganic salts, such as alkali metal or ammonium sulfates, phosphates or chlorides to obtain a product which in a finely divided condition shows little or no tendency to stick together.

Manufacture of soap with recovery of glycerine from spent lye. W. S. Kao. (Chemical Development Co.). *British 658,954.* Process for the manufacture of soap, wherein a fine stream of boiled soap is introduced into a graining bath maintained at a temperature of 60-95°. Rapid separation of soap curds from lye occurs and the curds of soap hydrate can be continuously removed from the bath and the curds are then separated from contaminating lyes by means of a separating screen or the like outside the bath.

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• Waxes

E. H. McMullen, Abstractor

Emulsion reactions: hydrolysis of wool wax. J. L. Horner and E. V. Truter. *Nature*, London, **165**, 771(1950). The rate of hydrolysis of wool wax in a H_2O-in-oil emulsion is much greater than that in an oil-in-H_2O emulsion. Hydrolysis is complete, by this method, in six hours at 100° when wax (1 g.) is treated with 6N-NaOH (1 c.c.). With 2N-NaOH at 60° the H_2O-in-oil emulsion of wool wax is unstable and reaction is 28% complete in 10 hr. On adding Na palmitate to this system the emulsion is stabilized and reaction is 37% complete in 10 hr. 6N-NaOH at 60° gives a stable emulsion with wool wax. Reaction is 64% complete in 10 hr. and the rate is almost unaffected by adding soap. The magnitude of the interface is therefore important to the rate of reaction. Addition of cholesterol, a hydrolysis product of the wax, to the reaction mixture reduces the rate of reaction due to film-formation at the interface; this effect is reduced by adding EtOH to the aq. phase. The rates of hydrolysis of wool wax at 60° by 4N-NaOH and by 2N-NaOH in 4N-NaCl are equal. (*Brit. Abs.* BII, April, **1951**, 421)

Paste index of waxes. New tentative method. L. Ivanovszky. *Paint, Oil, Colour J.* **118**, 816-822(1950). The paste index of a wax is proposed as a measure of consistency. The wax is made into a paste with paraffin wax and solvent, and, after maturing, the hardness is determined with a standard penetrometer, using a penetrator of special design. The wax paste, composed of wax mixture 25 and solvent 75%, the mixture containing test wax 30 and paraffin wax (135-140°) 70%, is poured into test dishes, 100 mm. in diameter and 20 mm. deep, allowed to mature for 24 hr., the surface then shaved flat with a blade, and tested after a further 24 hr. The penetrator is a cylindrical tube, 10 mm. in internal diameter, with a 5-degree taper and a cutting edge 0.18 mm. deep. The penetration time is 10 sec., and the test temp. 18-19°. Indices (added load 200 g.) are given for a number of waxes; they vary from 98 for a carnauba wax to 67 for ouricoury wax. (*Brit. Abs.* BII, May, **1951**, 507)

Chemical and biochemical properties of human hair and wool fats. E. Lederer. *Industr. Parfum.* **5**, 552-554(1950). The compositions of the fats extracted from human hair and from wool are given and the biochemical significance of the constituents, particularly the fungicidal activity of the C_{7-11}-fatty acids, is discussed. Evidence which indicates the synthesis of sterols, triterpenes, and fatty acids by the sebacic glands is summarized. (*Brit. Abs.* BII, April, **1951**, 441)

Composition of surface skin fat from the human forearm. R. M. B. MacKenna, V. R. Wheatley, and A. Wormall. *Amer. Perfum.* **56**, 474(1950). The composition of the sebum obtained by extraction with acetone of the forearms of nine groups of subjects is given. It is only moderately soluble in fat solvents. Ash content is 0.02% and the average composition is: free unsaturated fatty acids 20%, free saturated fatty acids 10%, triglycerides 25%, non-glyceridic fatty acid esters (waxes etc.) 25%, cholesterol (free and combined) 5%, hydrocarbons (including squalene 5%) 15%. Lipid-N is 0.11-0.18% and the urea-N is about the same. Significant amounts of vitamin E and 0.003% of vitamin P are present. (*Brit. Abs.* BII, April, **1951**, 441)

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Extraction of unsaponifiables from wool grease. A. B. Porter (Nopco Chem. Co.). *U. S. 2,499,877.* Solvent-extracted or acid-cracked grade wool grease is saponified with 4-200% excess of alcoholic alkali-metal (Na or K) carbonate or hydroxide, the saponified mass partly neutralized with mineral acid to pH 8.5-11, and the mixture extracted with a halogenated hydrocarbon solvent, preferably $(CH_2Cl)_2$, to give a quantitative recovery of sterols etc. (*Brit. Abs.* BII, April, **1951**, 445)

Processing of wool wax alcohols. Fulmer Research Institute, Ltd. and E. S. Lower. *British 643,422.* The surface-active (emulsifying) properties and/or solubility of mixed wool wax alcohols (Hartolan) derived from lanolin are improved by interaction with liquid or gaseous $(CH_2)_2O$ at 130-170°, in presence of a basic catalyst, e.g. NaOMe. (*Brit. Abs.* BII, April, **1951**, 445)

Apparatus for electroöptic determination of the paraffinic content of crystallized waxes. Karl A. Fischer. *U. S. 2,562,991.* To the tested wax kept in molten state is added a small quantity (e.g. 0.1%) of Sudan red or alizarinirisol blue and the thus colored substance is picked up on the edge of a transparent disk rotating slowly (1 revolution in 5 min.) within the container. The slow movement of the disk permits solidification, respectively, crystallization of the colored molten wax and using a light source the photovoltaic cell records by means of a graduated microammeter the percentages of impurities, since oil-free waxes show even, slightly gray in color. Modifications in the used light beam are made for low-melting soft paraffins and for high-melting paraffins. (*Chem. Abs.* **45**, 9284)

Synthetic wax of the carnauba type. S. P. Lovell (Lovell Chemical Co.). *U. S. 2,560,773.* Molten polyethylene 7-35% and molten microcrystalline petroleum wax 93-65% was stirred and gradually heated to 400°F. until the lumpy mixture became a viscous liquid containing granular matter. Upon continued heat, the liquid became homogeneous. This was cooled and gave a hard light yellow-brown wax, melting at 216°F., specific gravity 0.9307, viscosity 230 centipoises at 320°F., and dielectric breakdown resistance 722 volts for 0.001 inches of film. The wax is more flexible and less brittle than carnauba, takes a high polish, can be blended with other waxes, and can readily be converted to a thixotropic gel by solution in hot hydrocarbons. (*Chem. Abs.* **45**, 9284)

Isolation of cholesterol from wool wax alcohols. Organon Laboratories Ltd. and C. L. Hewett. *British 646,227.* A process is described for the isolation of cholesterol (I) from the nonsaponifiable components of wool grease known as wool wax alcohols. Thus, wool wax alcohols (1000) are dissolved in boiling MeOH (7000) and the solution is cooled to 40° when "iso-cholesterol" (II) separates. The crude II is filtered and recrystallized from MeOH (4000). The combined MeOH filtrates are evaporated to dryness and the residue is dissolved in $COMe_2$ (4000); after cooling overnight, a wax-like compound (III) (100) separates and is removed by filtration. The $COMe_2$ liquors are evaporated to dryness and the residue is dissolved in glacial AcOH (1000); on cooling to 20°, I (165 pt.) is obtained as needles (melting point 148-149°, after recrystallization from methylated spirit). If the preliminary removal of II is omitted, the separation of I and II is effected by filtering the AcOH solution at 30-35°, thus retaining II in solution. (*Brit. Abs.* BII, April, **1951**, 391)

Production of wax and oxalic acid from peat. Minister of Supply. *British 647,693.* Air-dried peat is added with stirirng (to break up froth) to $\sim$ four parts of concentrated (85%) HNO_3 at <60°, and after a further period of <60°, the resulting sludge containing peat wax (I) is separated, washed with H_2O, neutralized with alkali, coagulated (by warming), dried, and solvent-extracted to give I, melting point 73-74° (12% yield), of improved quality. Mother-liquors from the process may be treated for the recovery of oxalic acid.