# ABSTRACTS . . . . . . . . . . . . . Don Whyte, Editor

## • Oils and Fats

R. A. Reiners, Abstractor

**$C_{18}$ unsaturated acids of butter fat.** F. B. Shorland (Dept. of Scientific and Industrial Research, Wellington, New Zealand). *Nature* **166**, 745(1950). The author reports the presence of about 3% linolenic acid in the fatty acids from New Zealand butter. This was confirmed by isolation of the hexabromide.

**Conservation of food fats.** J. P. Sisley. *Rev. fermentations et inds. aliment.* **5**, 126-35(1950). A review of rancidity, with discussion of numerous antioxidants and synergists; 43 references. (*Chem. Abs.* **44**, 10952)

**The component acids of some authentic and commercial stillingia oils.** A. Crossley and T. P. Hilditch (The Univ. Liverpool). *J. Sci. Food Agri.* **1**, 292(1950). Stillingia oils from 3 specimens of seeds of *Sapium sebiferum* and from 2 specimens of seeds of *S. discolor* have been examined and the component fatty acids found to include about 5% deca-2:4-dienoic acid, 8% oleic acid, 12% saturated acids, 25-40% linoleic and 35-50% linolenic acids. The proportions of the latter two acids vary with the species and the season. The presence of elaeostearic acid in commercial stillingia oils has been reported but is believed to be due to contamination with tung oil.

**The fat of phaseolus radiatus var. aurea. I. Fatty acids and sterols.** N. Ito (Hokkaido Univ., Sapporo). *J. Agr. Chem. Soc. Japan* **17**, 1005-8(1941); *Bull. Agr. Chem. Soc. Japan* **17**, 111-12(1941). Adzuki beans were extracted with ether. Acetone-insoluble matter (23.6% of the ether extract) was removed, and the pure fat thus obtained had $d^{15}$ 0.9618, $n^{20}$ 1.4670, saponification value 176, acid value 29, iodine value (Wijs) 58, and unsaponifiable matter 11%. The mixture of nonvolatile fatty acids, neutralization value 197 and iodine value 122, consisted of 25% solid acids (stearic 50, palmitic 30, and carnaubic [?] 20%) and 75% liquid acids (mainly linoleic with oleic and a little linolenic acid). Among unsaponifiable substances stigmasterol was identified.

**II. Phospholipid and saponin.** *Ibid.* **19**, 1-6(1943). The acetone-insoluble matter of the ether extract of adzuki beans consisted mainly of cuorin, a monoaminodiphosphatide. The fatty acids of the cuorin were palmitic, myristic, and oleic (?); the glycerophosphoric acid was mainly in α-form with a little β-form. Much phospholipid was dissolved by alcohol from adzuki beans. Saponin was not found but a prosapogenin, m. 221° (decomposition) was separated. (*Chem. Abs.* **44**, 11124)

**Chromatographic separation of the saturated $C_2$-$C_8$ fatty acids from a single small sample.** D. Fairbairn and R. P. Harpur (McGill Univ., Canada). *Nature* **166**, 790(1950). Two small columns (14 mm. diameter, 2 g. adsorbant) are prepared, the first containing silica gel on which an alkaline solution of alphamine red R is adsorbed, the second containing silica gel on which an alkaline solution of bromocresol green is adsorbed. The alphamine red R column is then placed over the bromocresol green column. The solution of acids in chloroform-butanol (99:1) is put on the column and the acids eluted with a 199:1 chloroform-butanol solution. The $C_6$ and $C_8$ acids are rapidly eluted to the lower column where they are fractionated. The columns are then separated and eluted. The acids in the eluate are determined by titration. Separation of the acids, particularly $C_6$ and below, is very good.

**Delphos solvent soy plant capacity 110 tons daily.** Anon. *Am. Miller & Processor* **78**(11), 27(1950). A recently installed soybean extraction plant which had a rated capacity of 70-80 tons per day is now being operated at 110 tons per day.

**Structure of the mycolic acids of mycobacteria.** J. Asselineau and E. Lederer (Institut de Biologie Physico-Chemique). *Nature* **166**, 782(1950). Mycolic acid, a high molecular weight fatty acid ($C_{88}H_{176}O_4$) isolated from various strains of Mycobacteria, was shown to be a β hydroxy fatty acid with a long ($C_{24}$) α-side chain.

**Behavior of 10,11-undecylenic acid on air-oxidation at 80°.** S. DalNogare and C. E. Bricker (Princeton Univ.). *J. Org. Chem.* **15**, 1299(1950). Samples of 10,11-undecylenic acid were oxidized at 80° with air for 2-7 days. The principal oxidation products were sebacic acid, 10,11-dihydroxyhendecanoic acid and some polymeric material. The latter was probably formed by aldol type condensations of keto oxidation products. The 10,11-dihydroxyhendecanoic acid, present in the oxidized mixture as a high-molecular weight ester, apparently resulted from the reaction of epoxide and carboxyl groups.

**Water-injection streamlines miscella clarification.** J. M. Crocken (Blaw-Knox Co.). *Chem. Eng.* **11**, 160(1950). A newly developed water injection technique now permits the removal of oil-seed fines from miscellas in commercially available continuous centrifuges. A small amount of surface-active agent may be added to the water to permit rapid wetting of the fines. Miscellas containing as much as 1% fines can be clarified economically.

**Vegetable oils in Venezuela.** Anon. *Econ. Botany* **4**, 300(1950). An abstract of the report of the Food and Agriculture Organization of the United Nations on the edible oil resources of Venezuela.

**The influence of physico-chemical factors in extraction.** Mlle. Filhes. *Oleagineux* **5**, 705-708(1950). Mechanical improvements in the screw press and the effect on diffusion is discussed.

**A quick titration of glycerol through potassium periodate.** R. Colson. *Oleagineux* **5**, 701-704(1950). The method is rapid and shows an accuracy of 0.4%.

**14th chemical engineering materials of construction report. Fatty acids.** *Chem. Eng.* **11**, 118(1950). A compilation of expert opinion on the suitability of various coatings and construction materials for units processing fatty acids.

**The seed fat of macadamia ternifolia.** R. E. Bridge and T. P. Hilditch (The Univ., Liverpool). *J. Chem. Soc.* **1950**, 2396. The nuts of *Macadamia ternifolia*, a tree found in Australia, contain seeds with a 73% oil content. The component acids of the oil are oleic, 60%; palmitoleic, 20%; palmitic, 8%; stearic, 3%; and small proportions of linoleic, eicosenoic, myristic, and arachidic.

**Quantitative hydrogenation of unsaturated fatty acid derivatives.** J. F. Mead and D. R. Howton (Univ. California). *Anal. Chem.* **22**, 1204(1950). A procedure is outlined for determining the unsaturation of less-than-milligram amounts of fatty acid derivatives by hydrogenation in a slightly modified Barcroft-Warburg apparatus.

**Determination of trans-octadecenoic acids, esters and alcohols in mixtures.** O. D. Shreve and M. R. Heether (E. I. duPont de Nemours & Co.) and H. B. Knight and D. Swern (Eastern Reg. Res. Lab.). *Anal. Chem.* **22**, 1261(1950). An infra-red spectrophotometric method, based on differences in absorption of 10.36 microns is described for the determination of *trans*-octadecenoic acids, esters (including glycerides), and alcohols in the presence of the corresponding cis and saturated compounds. Extinction coefficients are reported for 17 pure cis and trans mono-unsaturated and saturated acids, esters and alcohols. The method is rapid, accurate, and directly applicable to determination of trans isomers in acid, ester, and alcohol mixtures. Only small samples are required.

**Possibilities afforded by the infra-red spectrum for the study of the constituents of fats.** J. Lecomte. *Oleagineux* **5**, 685-688(1950). The properties of the infra-red spectrum and the techniques necessary to obtain absorption spectra suitable for chemical analysis are described. General information on the absorption spectra of aliphatic acids and the corresponding etherial salts is given.

**The essential oil from the resin of commiphora mukul, hook. ex. stocks.** A. Bhatin (Agra College, Agra). *Jour. Indian Chem. Soc.* **27**, No. 9, 436-440(1950). The chief components of the essential oil from the resin of *Balsamodendron mukul* are 64% myrcene, 11% dimyrcene, and some polymyrcene.

**New research work on grape-seed oils.** G. Salomone. *Olearia* **4**, 367-370(1950). Grape-seed oils containing considerable amounts of hydroxylated fatty acids can be obtained by chemical treatment or by enzymosis. These oils are useful for the production of sulfur-oleates and oils of good drying qualities.

**Argentine experiments for extracting olive oil by the No. 3 acquarone method.** P. G. Garoglio. *Olearia* **4**, 361-366(1950). The principles of the acquarone method of extraction of olive oil was described. A plant at Mendoza, Argentina, showed no improvement in yield but produced a more fruity oil.

**Studies on the mechanism of autoxidation of fats. Part I. Kinetics of catalytic oxidation of oleic and linoleic acids.** S. Mukherjee (University College of Science, Calcutta). *Jour. Indian Chem. Soc.* **27**, No. 5, 230-237(1950). The mechanism of autoxidation of unsaturated fatty acids by the use of catalysts has been studied up to a primary stage of oxidation. The oxygen absorbed is used in peroxide formation at the double bond until it has full saturation of the double bond by peroxidation, which is then followed by oxidation at the active methylene group.

**Studies on the mechanism of autoxidation of fats. Part II. Oxidation of methyl oleate and methyl linoleate.** S. Mukherjee. *Ibid.* 238-244. In the course of autoxidation of fatty acids like oleic and linoleic and their methyl esters, oxygen achieves its effect by initiating its attack additively at the double bond of the unsaturated fatty acid molecules with the formation of cyclic peroxides. Oxidation is next found to proceed with the formation of hydroperoxides at a stage when initial cycloperoxidation of the unsaturated fatty acid molecules generates adequate energy to cause disruption of an α-methylenic hydrogen atom adjacent to the double bond.

**Herbaceous oil crops in Italy in the 1949 season.** M. Baldacci and F. Fischetti. *Olearia* 4, 371-376(1950). The crops and production of oil seeds in Italy in 1949 are surveyed. Detailed production figures for the eight most important oils are given.

**Canadian erucic acid oils. V. Physical, chemical and edible properties of oil from weed seed screenings.** N. H. Grace, H. P. Lips, and A. Zuckerman (National Res. Labs., Ottawa). *Can. J. Res.* 28F, 401(1950). A plant for the solvent extraction of weed seed screenings is in operation at Fort William. The average composition of the weed seed was: wild mustard (*Brassica arvensis*) 68%, mixed weed seeds 23%, crop seeds 6%, broken and unidentified seeds 3%. The characteristics of the oil were: iodine value, 124; saponification no., 182; free fatty acids (as oleic), 2%. Although the oil was not as palatable as corn or cottonseed salad oils, it was entirely acceptable as a shortening. The smoke point of fresh oil was 405°F. and the baking volume properties were excellent.

**Microscopic appearance of polymorphic forms of one-acid triglycerides.** O. T. Quimby (Procter and Gamble Company). *J. Am. Chem. Soc.* 72, 5064(1950). Results obtained by the use of a polarizing microscope along with x-ray and thermal data show that fats of the tristearin type exist in but three polymorphic forms each having its characteristic microscopic appearance as well as melting point and x-ray diffraction pattern. It is stated that the beta prime form gives a wide range of appearances from dull to bright (between crossed nicols). The alpha form is not vitreous but more nearly resembles a somewhat disordered crystal.

**Antioxidants and oxygen.** V. Broglia. *Chimica* (Milan) 5, 13-22(1950). Some experiments are described on the antioxidant action of phenols on petroleum, oils and fats, rubber, etc. (*Chem. Abs.* 44, 10396)

**Separation and stabilization of fatty acids by urea complexes.** H. Schlenk and R. T. Holman (Texas Agricultural Exp. Station). *J. Am. Chem. Soc.* 72, 5001(1950). Binary mixtures of fatty acids were separated by use of urea complexes. Stearic and lauric acids can be separated fairly well as can stearic and β-eleostearic acids but oleic and β-eleostearic acids are not separated well. Methyl oleate was separated from olive oil methyl esters in 40% yield by use of urea complexes and vacuum distillation. The urea complexes of unsaturated fatty acids are not subject to autoxidation.

**Hygroscopicity of glycerol.** C. Yonese (Kanegafuchi Fats and Oils Ind. Co.). *Science* (Japan) 14, 389-90(1944). Dynamite glycerol (98.5%), pharmacopeia glycerol (87%), and crude glycerol (83%) were allowed to stand in the atmosphere, and the change of n was observed. Glycerol was in an equilibrium at about 70% concentration at room temperature and 70-80% humidity. The velocity of absorption of moisture from saturated atmosphere decreased in the order: concentrated $H_2SO_4 >$ $CaCl_2 >$ ethylene glycol > dynamite glycerol > crude glycerol > pharmacopeia glycerol. (*Chem. Abs.* 44, 10417)

**Alkalimetric microtitration of fatty acids.** J. G. Tous and A. V. Pizarro (Seville Univ., Seville, Spain). *Anales fis. y quim.* (Madrid) 46B, 105-10(1950). The solvent used for the acids is a mixture of chloroform 2 parts, ethyl ether 1, and alcohol 1. The standard solution is 0.5 N K ethylate. Approximately 5 mg. of the substance to be determined is placed in the test tube with 0.2 cc. of solvent, which has been previously neutralized together with phenolphthalein (0.1% of solvent). The mean error for pure fatty acids is 5.5%, while that for mixtures is 6.4%. (*Chem. Abs.* 44, 10601)

**Refractometric microdetermination of the lower fatty acids.** J. G. Tous and A. V. Pizarro (Seville Univ., Seville, Spain). *Anales fis. y quim.* (Madrid) 46B, 111-18(1950). The weight of pure fatty acids in benzene solution was determined by measuring specific dispersions of n for Hg lines e and g with a Zeiss refractometer at 20°. The dispersion is a function of the concentration in mg./g. solution of the saturated acids dissolved, both in simple solutions and in mixtures. The equation relating the dispersions to the total weight dissolved is: $n = ax + b$, in which n is the dispersion, x is the weight of acids dissolved in mg./g. solution, a is $0.134 \times 10^{-4}$, and b is the dispersion of benzene. (*Chem. Abs.* 44, 10602)

**The determination of α, β-unsaturated fatty acids.** P. Savary (Faculte sci., Marseilles). *Bull. soc. chim. France* 1950, 624-7. The Kaufmann method of determining the iodine no. in 2-nonenoic, 2-tetradecenoic, 2-heptadecenoic, and 2-nonadecenoic acids gives more accurate results than other methods. The preparation of α,β-unsaturated acids by the action of alcoholic KOH on α-halogen acids gives low yields. This is due to the preferential formation of α-hydroxy acids. (*Chem. Abs.* 44, 10602)

**The synthesis of fat by microorganisms and possibilities for its industrial application.** H. Lundin. *Suomen Kemistilehti* 23A, 23-39(1950). A review, chiefly of Swedish work, on synthesis of useful fats by microorgagnisms, done since 1941. A yield of up to 20 g. fat per 100 g. sugars consumed can be obtained. The sugars utilized include those in molasses, wood hydrolyzates, etc. (*Chem. Abs.* 44, 10801)

**Microbiological fat synthesis.** H. Lundin. *Rept. Proc. 4th Intern. Congr. Microbiol.* 1947, 542-4. Methods for the production of fat by *Rhodotorula gracilis* are outlined. In countries where there is a shortage of fats but a surplus of fermentable carbohydrates, the process could be used not only to provide edible fat but also yeast proteins high in lysine. (*Chem. Abs.* 44, 10805)

**Microbiological fat synthesis by heterotrophic organisms.** K. Bernhauer. *Fette u. Seifen* 52, 203-6(1950). A review with 40 references. (*Chem. Abs.* 44, 10809)

**Fat production from yeast.** A. Kleinzeller. *Rept. Proc. 4th Intern. Congr. Microbiol.* 1947, 544-6. Quantitative data are presented on the yields of fat from *Torulopsis lipofera* and Starkey's strains 72 and 74. The latter gave the highest yields of fat but also produced considerable amounts of polysaccharide. The fats from these yeasts have similar chemical composition; with rapid formation of fat its iodine value decreases. An analysis of the fatty acids of the fat of Starkey's 72 showed 54.5% oleic acid, 25.6% palmitic acid, and smaller amounts of other fatty acids. In chemical composition it resembles animal fat rather than vegetable fat. (*Chem. Abs.* 44, 10805)

**Studies of the effect of $C_{18}$ unsaturated fatty acids on growth and respiration of micrococcus pyogenes var. aureus.** E. S. Wynne and J. W. Foster (Univ. of Oklahoma, Norman). *J. Infectious Diseases* 86, 33-7(1950). Sodium salts of oleic and linolenic acids were quite inhibitory to growth of the Rosenbach strain of *Micrococcus pyogenes* var. *aureus* in a synthetic medium. Somewhat higher concentrations of linolenate markedly depressed oxygen uptake of suspensions presumably because of a rapid bactericidal effect. Appropriate concentrations of lecithin reversed the growth inhibition of oleate and even gave better growth than was obtained in the controls. Though cholesterol was somewhat inhibitory itself, oleate and cholesterol displayed a mutual detoxifying action. Ergosterol was much more toxic, but oleate was capable of reducing the toxicity of ergosterol to that observed with oleate alone. (*Chem. Abs.* 44, 10810)

**Chemistry and biology of cutaneous surface fat.** H. Lincke (Univ., Zurich, Switz.). *Arch. Dermatol. u. Syphilis* 188, 453-81 (1949). Women have 28% less skin surface fat than men. Average acid no. of the fat was 25-50 corresponding to 13-25% free fatty acid (equivalent weight about 290). Individual fat fractions are subject to considerable variations. Phosphatides could not be demonstrated. (*Chem. Abs.* 44, 10852)

**The lipids of salmon eggs. II. Lecithin.** K. Anno (Univ. Tokyo). *J. Agr. Chem. Soc. Japan* 23, 162-6(1949). From salmon eggs a crude lecithin-$CdCl_2$ salt was obtained; this was freed of cephalin-$CdCl_2$ by treatment with ether and centrifuging; the purified lecithin-$CdCl_2$ contained N 1.39 and P 2.84%. The complex was hydrolyzed with 1.5% $Ba(OH)_2$. Of the fatty acids of lecithin 25% are solid and 75% liquid. The solid acids are largely palmitic with a little stearic acid. The liquid acids are chiefly oleic, with a little clupanodonic and arachidonic acids. (*Chem. Abs.* 44, 10937)

**Degradation and synthesis in decomposition of fats by sulfate-reducing bacteria.** G. L. Seliber (Lesgafta State Inst. Sci. Research, Leningrad). *Mikrobiologiya* 19, 294-8(1950). Decomposition of solid animal fats by sulfate-reducing bacteria, e.g., from lake muds, increases unsaponifiable matter, iodine no., molecular weight, and sometimes chain length. Probably $-CH_2-$ groups, formed from $H_2$ and CO (or $CO_2$), enter new C-C linkages. There is evidence that the organisms participate in conversion to carbohydrates, sapropels, and petroleum. (*Chem. Abs.* **44**, 11123)

**Oils of the fruit seeds.** J. Koblic. *Chem. Obzor* **25,** 87-90, 106-8 (1950). The analyses are given of the raw oils in seeds of the following: berries of the mountain ash, apples and pears, raspberries, bilberries and red whortleberries, hips, grapes, juniper berries and peels, plum pits, and red currants. (*Chem. Abs.* **44**, 11125)

**Turkish vegetable oils.** T. Yazicioglu (Univ. of Ankara) and H. K. Dean. *Soap, Perfumery & Cosmetics* **23**, 921-6, 936 (1950). The principal Turkish oils are olive, sunflower, cottonseed, sesame seed, linseed, and poppyseed. Rape, safflower, peanut, soybean, and castor seed are also produced. The composition, cultivation in acres, and production in tons, are given for these oils in 21 tables. The raw materials used for soap in Turkey are also mentioned. (*Chem. Abs.* **44**, 11126)

**Determination of moisture in oil seeds by the method of Fischer.** M. Th. Francois and A. Sergent (Lab. Chevreul, Paris). *Bull. mens. ITERG.* **4**, 401-4(1950). It is not advisable to introduce the crushed seeds directly into the Fischer reagent. Reflux 5 g. of finely divided (Peugeot mill No. 2) seed with 100 ml. of anhydrous methanol for an experimentally determined time, e.g. 90 min. for peanuts. Cool, introduce 10 ml. of the solution into the reagent and proceed further as usual. Results thus obtained with soybean and peanuts differed among themselves not more than 0.04%, but were up to 1.9% higher than results obtained by the official oven method. (*Chem. Abs.* **44**, 11126)

**Castor bean grown in 1949 in the southwest of France.** M. Th. Francois and J. Couturier (Lab. Chevreul, Paris). *Bull. mens. ITERG.* **4**, 404-6(1950). Moisture content, oil content (36-51%), and characteristics of the extracted oil of 7 samples are given. There is no notable difference from beans grown in Africa or Brazil. (*Chem. Abs.* **44**, 11127)

**Tall oil.** E. Last. Seifen-Ole-Fette-Wachse **76**, 177-9, 199-202, 221-3, 243-5(1950). Review of analysis of tall oil, isolation of sterols from it, the separation of fat acids and resin acids, and its use in the production of oil-modified synthetic resins, pigment-binding agents, textile assistants, and other products. 58 references. (*Chem. Abs.* **44**, 11129)

**Constituents of turtle oil. III.** A. Ogata and A. Minato (Univ. Tokyo). *J. Pharm. Soc. Japan* **62**, 106-19(1942). Cheloniasterol, $C_{27}H_{46}O$, and cholesterol were isolated in the proportion of 1:7.

**IV. Cutaneous absorption of turtle oil .** A Minato. *Ibid.* 119-29. In general turtle oil is absorbed by the skin better than olive oil. Addition of 0.5-1.0% cholesterol or cheloniasterol to olive oil increased the rate of absorption by skin. (*Chem. Abs.* **44**, 11124)

**Production of oil from coffee grounds.** G. Gernert. *Seifen-Ole-Fette-Wachse* **76**, 181-2(1950). Review with 15 references. (*Chem. Abs.* **44**, 11125)

**Coffee oil. IV. The sterols.** K. H. Bauer and R. Neu (Univ., Leipzig., Ger.). *Fette u. Seifen* **51**, 343-7(1944). The sterol mixture obtained from coffee oil contained 14.5% stigmasterol. The name coffeasterol is proposed for a sterol, $C_{26}H_{44}O$, m. 147-9°C. Coffeasterol acetate, needles from methanol, melts at 147-9°C.; coffeasterol benzoate, tablets from methanol-ether melts at 141-3°C. (*Chem. Abs.* **44**, 11125)

**Economic bleaching of vegetable oils in hydrogenation factories.** L. B. Mathur (Armit Banaspati Co., Ltd., Ghaziabad). *J. Indian Chem. Soc., Ind. & News Ed.* **12**, 133-6(1949). The results of experiments conducted in the laboratory and factory to determine the extent to which the cost of bleaching vegetable oils in the hydrogenation process could be lowered indicated that the combined adsorptive power of 0.1% of fuller's earth and 0.01 to 0.02% of activated charcoal, the latter used under hydrogenating conditions at temperatures up to 180°C. and atmospheric pressure, is approximately equivalent to the combined adsorptive power of 1.5% of fuller's earth and 0.2% of activated charcoal under usual conditions of bleaching in vacuo. By equating the tintometer readings with the amounts of a 0.25% solution of oil-soluble yellow AB in a hydrogenated oil sample which produced the particular tint, it was calculated that under hydrogenating conditions activated charcoal will adsorb 2.2% its weight of the color, while in vacuo in conjunction with fuller's earth it will adsorb only 0.03%. (*Chem. Abs.* **44**, 11125)

**Analysis of tea oil.** V. P. Goguadze, E. P. Khechinashvili and M. I. Tarenko (Inst. of Chem., Acad. Sci. Georgia S.S.R., Tiflis, U.S.S.R.). *Zhur. Anal. Khim.* **5**, 308-14(1950). The unsaponifiable fraction of the oil from ripe seeds of native-grown *Thea sinensis* comprised approximately 2.5%. The total content of fatty acids was 92.5%, 0.8% of the total acids (saturated and unsaturated) was arachic acid, 4.9% palmitic acid, and 1.2% stearic acid. The unsaturated acids comprised oleic acid 86.7 and linoleic 6.8% of total. (*Chem. Abs.* **44**, 11125)

**Comparison of papaver rhoeas seed oil with papaver somniferum seed oil.** W. Awe and G. Kunert (Tech. Hochschule, Braunschweig, Ger.). *Fette u. Seifen* **52**, 268-73(1950). The constants for the seed oils of *P. rhoeas* and *P. somniferum* are as follows: $d^{20}$ 0.9202, 0.8997; solidification point —16 to —18°C.; $n^{20}$ 1.4755, 1.4692; acid no. 5.3, 144.2; saponification no. 189.1, 189.2; ester no. 183.8, 45.0; iodine no. (Hanus) 137.8, 137.8; saturated fatty acids 8.01%, 8.36%; stearic acid 2.43%, 2.30%; palmitic acid 5.58%, 6.06%; linoleic acid 69.77%, 71.68%. (*Chem. Abs.* **44**, 11126)

**Chemistry of lipids.** H. J. Deuel, Jr. (Univ. of Southern California, Los Angeles). *Ann. Rev. Biochem.* **19**, 89-110(1950). This review covers fatty acids and triglycerides (fatty acid distribution in triglycerides; composition of vegetable and animal fats; new fatty acids and related compounds; synthesis, analysis, and properties), and conjugate lipids (new compounds, occurrence in tissues, and preparation of lecithin and cephalin). (*Chem. Abs.* **44**, 10764)

**Domestic oils in margarine production.** R. G. Spears (Lever Brothers). *Soybean Digest* **11**(1), 13(1950). Domestic oils are used almost exclusively in this country for the manufacture of margarine.

## PATENTS

**Recovery of sterols from wool fat.** H. H. Young and E. F. Christopher (Swift & Co.). *U. S. 2,528,482.* Crude wool fat is decolorized by treatment with liquid propane at 160°-170°F. and 550-600 psi. The decolorized material was extracted at 190°-200°F. and 600-700 psi. to obtain a fraction rich in sterols and sterol esters.

**Method of expressing oil.** F. W. Weigel (V. D. Anderson Co.). *U. S. 2,533,858.* Oil bearing material of vegetable origin is heated for 30 min. or more at a temperature at least 10 degrees lower than the predetermined optimum oil expressing temperature and immediately thereafter it is heated for 10 minutes at a temperature higher than that of the first treatment but less than the optimum oil-expressing temperature. The oil is then expressed from the material in a continuous expeller.

**Reaction of alkyl cycloparaffins with unsaturated fatty acids.** A. J. Shmidl (Standard Oil Dev. Co.). *U. S. 2,534,074.* Methyl cyclopentane is reacted with oleic acid in the presence of an acid reacting alkylation-isomerization catalyst at a temperature from 60°-300°F.

**Castor oil-organo silicon reaction products and method for production thereof.** F. J. Sowa. *U. S. 2,535,239.* A reaction product of castor oil and an organosilicon compound is claimed, the latter having the formula Ry Si Xz in which R is an alkyl radical, X is a halide or alkoxy group, y is either one or two, and z is two to three.

**Treatment of unrendered fat with nordihydroguaiaretic acid.** A. Fonyo (Wm. J. Stange Co.). *U. S. 2,535,910.* Unrendered fats are stabilized by exposing them to an aqueous solution of N.D.G.A. The solution is made up by dissolving N.D.G.A. in a mixture of sorbitan mono-laurate, -palmitate, -stearate, -oleate or their polyoxyalkylene derivatives, and polyethylene glycol mono-oleate, -dioleate, -mono-stearate, distearate and diluting with water.

**Separation and isolation of oil-soluble substances.** Lever Brothers & Unilever N. V. (Jan Boldingh). *Dutch 66,316.* Oil-soluble materials are dissolved in a solvent which is nonmiscible with oil and the solution contacted with an organic substance which swells but does not dissolve in oil-soluble solvents, e.g. weakly vulcanized rubber, Silastic (a silicon rubber) or certain vinyl chloride polymers. Examples are given for the extraction of carotene and xanthophyls from saponified palm oil dissolved in 50% ethanol; for the separation of lauric and palmitic acids, dissolved in the same solvent; of oleic and linoleic acids, dissolved in 80% ethanol and of a mixture of benzene and hexane. (*Chem. Abs.* **44**, 11132)

**Dienic acid.** F. Grun. *Swiss 266,511.* Horse fat was treated with pancreatin in a $Na_2CO_3$ solution at 35°C.; when the hydrolysis was almost complete, the free fatty acids were extracted with ether, washed with a saturated NaCl solution, dried with $Na_2SO_4$, and the concentration was adjusted to 10%. The mixture was cooled stepwise (—5°, —30°, —75°C.), and the precipitated unsaturated acids were removed. The acid was characterized by the tetrabromo derivative, m. 106°C. (*Chem. Abs.* **44**, 11131)

## • Biology and Nutrition

R. A. Reiners, Abstractor

**A revision of the Schoenheimer-Sperry method for cholesterol determination.** W. M. Sperry and M. Webb (Coll. Physicians and Surgeons, New York). *J. Biol Chem.* **187**, 97(1950). Investigation of this method indicated that 1) 16-18 hours were required for maximum precipitation, 2) aqueous digitonin solutions lose their ability to precipitate cholesterol quantitatively as they become older, 3) the rate of precipitation appears to be independent of the amount of cholesterol present within the range studied. Revisions were made in the method in accordance with these observations.

**Infra-red adsorption spectra of tocopherols and some of their chemical properties.** H. Rosenkrantz and Ada T. Milhorat (Cornell Univ. Med. Coll.). *J. Biol. Chem.* **187**, 83(1950). The infra-red adsorption spectra, from 2-16 μ, of the known tocopherols and some of their chemical products are presented.

**The carcinogenicity of fat "browned" by heating.** Ardelle Lane, D. Blickenstaff, and A. C. Ivy (Univ. Illinois Coll. of Med.). *Cancer* 3, 1044(1950). About 37% of the rats fed "browned" lard (350°C. for 30 min.) developed stomach lesions (usually after 12 months) whereas only 5.7% of the rats fed unheated lard developed lesions. Three malignant tumors (sarcoma) occurred among 31 rats that had been injected subcutaneously with heated lard or partially hydrogenated vegetable oil (350°C. for 30 min.) and observed for 12-18 months. No tumors developed in 150 control rats of the same age and strain. This proves that a carcinogen is formed on heating lard in an open vessel for 30 min. at 350°.

**Effect of xanthophylls on utilization of carotene by chicks.** M. G. Vavich and A. R. Kemmerer (Univ. Arizona). *Arch. Biochem.* **28**, 295(1950). On a relatively high carotene diet (130 μg β-carotene/day) daily doses from 100 to 600 μg of xanthophylls markedly reduced the liver storage of vitamin A. When the β-carotene dosage was halved, the administration of up to 600 μg xanthophyll/day did not reduce the storage of vitamin A in the liver.

**An unknown factor with vitamin A activity distilled from lard.** H. Kaunitz and C. A. Slanetz (Coll. Physicians and Surgeons, New York). *J. Nutrition* **42**, 375(1950). Freshly rendered lard was subjected to molecular distillation at 215° and $10^{-3}$ mm. Hg and a 7% distillate taken. Two per cent of this distillate when added to a vitamin A free diet gave nearly complete protection against vitamin A deficiency. The distillate was shown by chemical tests to be free of vitamin A or carotene. It was concluded that lard contains a factor with vitamin A-like activity which is chemically different from the known forms of vitamin A.

**A micro method for separating free and esterified vitamin A.** E. Eden (Univ. Cambridge). *Biochem J.* **46**, 259(1950). Vitamin A alcohol and its ester were separated chromatographically on an aluminum oxide column. The ester was not absorbed from a petroleum ether solution, whereas the alcohol was absorbed and could be eluted with 20% acetone in petroleum ether.

**Hydrolysis and esterification of vitamin A during adsorption.** E. Eden and K. C. Sellers (Univ. Cambridge). *Biochem. J.* **46**, 261(1950). The adsorption of vitamin A alcohol and ester in sheep and calves was studied and the results show that the ester is hydrolized almost completely in the intestinal lumen. Vitamin A was found to be present in the mucosa largely as the ester and remained in this form on passage into the lymph. The mechanism of adsorption of vitamin A was found to be essentially the same in the new-born calves as in older animals.

**Vitamin E deficiency in chicks. II. Plasma xanthophyll levels and vitamin E deficiency symptoms.** P. Goldhaber, Leona Zacharias, and V. E. Kinsey (Harvard Med. School, Boston). *J. Nutrition* **42**, 453(1950). Oral supplements of crude xanthophyll prevented the appearance of deficiency symptoms in 23 of 48 chicks raised on a vitamin E deficient diet. This protection is ascribed to the antioxidant activity of the xanthophylls. Cod liver oil was found to destroy xanthophyll. This was due to the presence of some unknown factor, in addition to vitamin A.

**The essential role of fatty acids in rations of growing chicks.** R. Reiser (Texas A. and M. Coll., College Station). *J. Nutrition* **42**, 319(1950). Polyunsaturated fatty acids are essential nutrients in the growth of chicks.

**The metabolism of polyunsaturated fatty acids in growing chicks.** *Ibid.* 325. Chicks cannot synthesize dienoic or trienoic acid but can convert dienoic acid to pentaenoic and possibly tetraenoic acids and can convert trienoic acid to dienoic, tetraenoic, pentaenoic, and hexaenoic acids.

**Nonglyceride constituents of Mahua-oil cake.** S. A. Saletore and B. L. Pandharipande (Nagpur Univ., Nagpur). *J. Indian Chem. Soc., Ind. & News Ed.* 12, 125-32(1949). Mahua-oil cake contains approximately 4.6% saponins and 3.7-6% phosphatides. A 1:4 alcohol-benzone mixture was found to be the best solvent for phosphatide extraction. It is suggested that mahua-oil cake may be utilized as a commercial source of saponins or phosphatides. (*Chem. Abs.* **44**, 11127)

**Composition and food value of oil-seed extraction meals.** K. Nehring. *Fette u. Seifen* **51**, 385-9(1944). Several oil-seed extraction meals were examined for their value in animal nutrition. The % nonvolatile, % organic matter, % protein, % fat, % crude fiber, % N-free extract, and % ash were all found. The seeds were rape seed, poppy seed, sunflower seed, dodder seed, linseed, mustard seed, hemp seed, and beechnut seed. (*Chem. Abs.* **44**, 11128)

**Identification of solvent residues in extraction meals.** W. Wodsak (Hyg. Inst. Hansestadt Hamburg, Hamburg, Ger.). *Fette u. Seifen* **52**, 296-8(1950). Moistening of the extracted meal with isobutyl alcohol and distilling with superheated steam at 140° yields an isobutyl alcohol layer giving a strong blue to violet fluorescence in the ultraviolet region. Samples which have not been extracted do not give this test. The fluorescence may be due to condensation products formed by the olefins in the extraction solvent since a sample which had been extracted with commercial hexane did not give this test. (*Chem. Abs.* **44**, 11128)

**Fat metabolism.** Grace Medes (Lankenau Hosp. Research Inst., Philadelphia, Pa.). *Ann. Rev. Biochem.* **19**, 215-34(1950). This year's review discusses mitochondria and metabolism of fatty acids; units of fatty acid metabolism; synthesis of fatty acids; oxidation of fatty acids; relationship to carbohydrates, sterols, proteins and amino acids; metabolism of unsaturated fatty acids; and fatty acids and growth. (*Chem. Abs.* **44**, 10862)

**Recent advances in estimation of vitamins A.** V. H. Booth (Univ. Cambridge). *Research* 3, 497(1950). A review.

## • Waxes

E. H. McMullen, Abstractor

**Caranda wax in Brazil.** Ayri de Medeiros Trancoso. *Rev. quim. ind.* (Rio de Janeiro) **17**, 192, 21-3(1948). Analysis gave the following: $d^{25}$ 0.984, melting point 82.2°, acid value 2.7, saponification no. 64.9, iodine no. 10.5 (Wijs 30 minutes), unsaponifiable matter 54.15%, fatty acids 45.5%. These are compared with constants of carnauba and ouricury waxes. (*Chem. Abs.* **44**, 10355)

**Distinction between Ouricury wax and Carnauba wax.** C. Ludecke and M. Diena. *Ind. vernice* (Milan) 2, 52-4(1948). Ouricury wax can be distinguished from carnauba wax by the red coloration which it gives on heating one gram with ten grams of 25% potassium hydroxide solution, the wax becoming red but the aqueous layer remaining colorless; carnauba remains colorless but colors the aqueous layer yellow. The difference between the melting point and the solidification point (melting point of refined ouricury wax 80-82°, solidification point 71°). Other constants of the wax are reported. (*Chem. Abs.* **44**, 10355)

**The residual oil of sweet orange peel.** A. Iachan and O. Gottlieb. *Rev. quim. ind.* (Rio de Janeiro) **19**, No. 215, 16-17 (1950). The non-volatile residue of Sao Paulo orange oil was clarified by filtering its 5% solution in chloroform through a mixture of active carbon and kieselguhr. The resulting odorless product is a waxy mass, $d^{25}$ 0.9706, $n^{20}$ 1.4903, melting at 37-40°, acid no. 2, saponification no. 90. It can be substituted for lanolin for many uses, and can be used in partial substitution for beeswax in polishes and as a plasticizer for varnishes. (*Chem. Abs.* 44, 10265)

**Modulus of rupture test for paraffin wax.** L. E. Hoag (American Can Co., Maywood, Ill.). *Tappi* 33, 343-5(1950). The modulus of rupture test for paraffin wax was developed to help predict performance of waxed-paper milk containers. A slab of wax 0.15 in. thick is cast over hot, distilled water. On cooling, the slab is cut into pieces ½ in. wide. The strip is placed on supports 2 in. apart and center loaded by a stream of water directed into a plastic bucket; breaking of the sample diverts the stream. Twelve strips are tested, six each with the air side and water side down. The standard deviation of the modulus of rupture was calculated to be 6 lb./sq. in. when tests were all performed in one laboratory. The apparatus is commercially available. (*Chem. Abs.* 44, 11129)

### PATENTS

**1,4-di(meta-pentadecyl-phenoxy)-butane.** M. T. Harvey (Harvel Corp.). *U. S. 2,503,731.* A white waxy solid melting at 190°F. is obtained by reacting one mole of 1,4-dichlorobutane with two moles of hydrogenated cardanol.

**Modified candelilla wax.** Cyril S. Treacy (Marmaroneck Chemical Corp.). *U. S. 2,521,553.* A modified candelilla wax having less tackiness and a higher melting point than the raw wax is prepared by treating the raw wax with 2-6% by weight of an organic acid or acid anhydride at 150°-200°. Condensation occurs in one to three hours. (*Chem. Abs.* 44, 10358)

**Paraffin-wax composition.** N. V. Philips' Gloeilampenfabrieken. *Dutch 65,850.* By adding polyethylene in a proportion of 2 to 5% by weight to paraffin wax the brittleness of the paraffin is decreased and the melting point is shifted to higher temperatures. The polyethylene may be mixed with the molten or dissolved paraffin wax as a powder or while in the dissolved state. Other substances, such as high-molecular weight compounds, paraffin oil, organic and inorganic fillers, may be added to the composition. (*Chem. Abs.* 44, 10314)

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## • Drying Oils

Stuart A. Harrison, Abstractor

**Drying oils for the paint industry.** (Anon.). *Paint, Oil and Colour J.* 118, 906, 994(1950). The different drying oils available commercially are discussed as to properties, price, and availability. The oils are considered largely from the standpoint of how they would fit into the British paint industry.

**Drying oils and resins—segregation of fatty acids and their derivatives by extractive crystallization with urea.** H. A. Newey, E. C. Shokal, A. C. Mueller, T. F. Bradley, and L. C. Fetterly. *Ind. Eng. Chem.*, 42, 2538(1950). Fatty acids can be separated according to their degree of unsaturation by extractive crystallization with urea. When a mixture of fatty acids are either mixed with a saturated solution of urea in water or alcohol or ground with solid urea a crystalline adduct is formed with the more saturated fraction of the acids. This can be filtered off and decomposed with excess water to give the free fatty acids of relatively low iodine number. The filtrate contains the fatty acids which have an iodine value well above that of the original mixture. The efficiency of separation by this method compares favorably with processes using fractional crystallization or selective extraction.

**Methods of testing adhesion of paints.** R. Quarendon. *Paint Manuf.* 20, No. 12, 427(1950). Some two dozen tests for the measurement of adhesion are described in some detail. The merits and drawbacks of the tests are discussed. No tests have been developed that make it possible to dispense with practical experience of a skilled tester for assessment of the performance of a paint under conditions of use. (15 references)

**Fungicidal varnishes and lacquers.** S. Ruggeri. *Paint and Varnish Production* 30, No. 12, 8(1950). The exposure conditions under which fungi thrive are (a) suitable food, (b) high humidity, (c) temperatures of 70°F. or higher, (d) source of oxygen, (e) absence of light. A good fungicide must have the following properties: (a) be active in small concentrations, (b) resist leaching by water, (c) be soluble in varnish and varnish solvents, and (d) be stable in lacquer or varnish at ordinary and elevated temperatures. Effective fungicides are: (1) phenyl mercuric ortho benzoic sulphamide (1.5%), (2) copper-8-quinolinate (2.0%), (3) salicylanilide (8.0%), and (4) pentachlorophenol (15.0%). The merits and defects of these compounds are discussed.

**About the formation of fatty acids with conjugated double bonds during the autoxidation of fats.** W. Burger and G. Wiedemann. *Fette u. Seifen* 52, No. 8, 459(1950). The ethyl esters were made of the mixed fatty acids of rapeseed oil and sunflower seed oil. Two samples of the esters were aged under different conditions and the changes followed for 90 days. One sample was exposed to air while the other was carefully blanketed with carbon dioxide. Both samples were exposed to sunlight at room temperature. The changes in the properties of the esters which were blanketed with carbon dioxide were small. The esters which were exposed to air showed an increase in acid number, Lea number (peroxide number), diene number, specific weight, and index of refraction. The iodine number decreased. The sample exposed to air showed an increase in diene number from 1.9 to 17.8 and a decrease in iodine number from 106 to 91.

**Modern methods for improving drying oils.** J. Baltes. *Fette u. Seifen* 52, No. 8, 462(1950). In the past few years three important methods of improving the drying properties of oils have been developed. All involve moving isolated double bonds into conjugated positions. The methods are (1) alkaline-isomerization, (2) catalytic-isomerization, and (3) chlorination-isomerization. The methods are reviewed and some experimental data are given. The last method involves treatment of an oil with t-butyl hypochlorite to give a chlorine containing mixture of conjugated and unconjugated fatty esters, i.e., treatment of soybean oil gives, under certain conditions, a product having 8.5% chlorine, 14% conjugated diene, 5% conjugated triene, and 0.3% conjugated tetraene. If this chlorinated product is heated briefly to 300-350° the chlorine content falls as does the diene content while the triene and tetraene content increases. Under specified conditions of heating the above chlorinated product gives a new product with 3.4% chlorine, 12.4% conjugated diene, 11.5% conjugated triene, and 0.49% conjugated tetraene.

**Oxidants and antioxidants.** H. Hadert. *Farbe u. Lacke* 56, 349(1950). The oxidation of linseed oil (100 g.) containing 0.01 mole of each of a series of 31 terpene hydrocarbons, alcohols, ketones, aldehydes, aromatic acids, and phenols was studied. Oxidation was accelerated strongly by isosafrole, benzaldehyde, acetophenone, benzophenone, α-ionone, vanillin, and piperonal, and less so by isopulegol, benzyl alcohol, phenethyl alcohol, and anethole. Oxidation was inhibited by thymol, safrole, eugenol, and isoeugenol. (*Chem. Abs.* 44, 11115)

**The viscosity of linseed oil lithographic varnish films during oxidation drying.** W. H. Banks and P. B. G. Upton. *J. Oil and Colour Chemists Association.* 33, No. 363, 397(1950). A technique was developed for measuring the viscosity of a material in a film by rolling a ball down an inclined plane of a film of the material on glass. These measurements showed that there is little change in the film viscosity until shortly before gelation sets in.

**The significance of hydroxyl values in the analysis of dehydrated castor oils.** E. O. Phillips. *J. Oil and Colour Chemists Assoc.* 33, No. 363, 395(1950). The hydroxyl value as usually determined is unreliable as a measure of the dehydration of castor oil because of the formation of estolides and partial glycerides during the process.

**Primary autoxidation reactions during the drying of oils.** W. Franke. *Farben, Lacke, Anstrickstoffe* 4, 301(1950). A review with 75 references. (*Chem. Abs.* 44, 11117)

**Molecular enlargement in unsaturated fat acids and their esters as a basis of the drying process and the preparation of surface coatings. IV. Influence of oxygen on the film formation of drying oils.** H. P. Kaufmann, J. Baltes, and R. Berger. *Fette u. Seifen*, 52, 276(1950). The amount of oxygen needed for film formation in drying oils is large enough to rule out the possibility that oxygen acts only as a catalyst. In practical use tests, films were not formed unless a large amount of air was present. The amount of oxygen necessary to form a hard elastic film on China wood oil is 3-4 moles per mole of glyceride. If the diene syntheses take place they are only secondary reactions. (*Chem. Abs.* 44, 11117)

### PATENTS

**Coating material emulsions.** L. Auer. *U. S. 2,530,370.* An oil-in-water emulsion surface coating material, the vehicle solids of which comprise soap-free bodied polyhydric alcohol esters of polyunsaturated acids of fatty oils, said ester being in a solid state in the water emulsion. The dispersed phase consists of 10 to 70% of the total weight of the emulsion. When exposed in a thin layer, the film sets solid in from a few seconds to an hour. The dispersed phase can be coagulated with barium chloride to give a continuous film.

**Condensation products of phenols and unsaturated acids.** F. J. Hermann, *Dutch 66,225.* Phenols and unsaturated carboxylic acids under the influence of catalysts such as AlCl$_3$, FeCl$_3$, BF$_3$, etc., give neutral high molecular weight oils as gelatinous products with an acid number of 40 or less, e.g., linseed oil fatty acids 24, phenol 50, and zinc chloride 45 are heated at 130-140° for three hours and then at a boil for three hours. After acidification the phenol is distilled with steam and the residue extracted with ether. A thick paste-like oil is obtained with an acid value of 40 and a hydroxyl value of 185. The product is suitable for varnish formulation. (*Chem. Abs.* **44**, 11123)

# • Detergents

Lenore Petchaft, Abstractor

**Nonionic surface-active agents—their chemistry and utilization in the textile industry.** Hillary Robinette (Amalgamated Chemical Corp., Philadelphia, Pa.). *Am. Dyestuff Reptr.* **39**, 888-90 (1950). The preparation and properties of nonionic surface-active agents are reviewed. Nonionics fall into three classes: nondispersible, dispersible, and soluble in water and may be tailor-made to fit the above classes by variation of hydrophilic and hydrophobic groups. Principal textile uses for nonionic compounds include wetting agents, scouring agents, yarn lubricants, antistatic agents, fulling agents, dyeing and leveling agents, stripping aids, and dispersing softening or finishing agents. Characteristics of nonionics which make them particularly effective in these processes are their oil solubility, and stability to acids, alkali, and salts.

**Dipole moments of metallic soaps.** B. C. Banerjee and S. R. Palit (Indian Assoc. for the Cultivation of Science, Calcutta). *Jour. Indian Chem. Soc.* **27**, No. 8, 385-394(1950). The dipole moments of the oleates of Zn, Cu, Mg, Ni, Pb, and Ca were determined by a heterodyne beat method. All the soaps except Zn were shown to be fairly highly polar, even though they are soluble in organic solvents. This high polarity was explained by the comparatively large separation of the charges owing to the centre of negative charge residing well within the hydrocarbon radical of the oleate.

**The cleansing action of soap.** Anon. *Am. Perfumer Essent. Oil Rev.* **56**, 489-90(1950). The various theories attempting to explain the mechanism of the cleansing action of soap including hydrolysis with resulting saponification of the dirt, and emulsification of dirt are reviewed. It is concluded that there is no theory that adequately explains the action of soap nor any accurate method of measuring detergent power.

**Progress in development of wool detergents, particularly in acid media.** J. Stadler. *Melliand Textilber* **31**, 556-60(1950). Anion- and cation-active detergents have strong affinity for the wool fiber and therefore require uneconomically large amounts to maintain the necessary concentration in solutions. The value of the harmless scouring of raw wool with the synthetic detergents is practically eliminated in subsequent alkaline fulling treatments. The discovery that satisfactory fulling could be obtained in weak acid solutions by means of derivatives of polyethylene oxide placed the synthetics in a much better competitive position by making it possible to carry out the whole process in acid or neutral solutions as well as by the possibility of reducing the number of treatments. Whereas, the detergent action of the anion-active materials depends on concentrations of the impurities in the foam, the nonionics produce emulsions in the liquid and can therefore scour without producing foam. The polyglycol ethers have been shown by Wurzschnitt to form polyoxonium hydroxides by hydration at lower temperatures, but with rising temperatures hydrolysis takes place. The hydrolyzed form attaches itself to the fatty matter and upon rinsing with cool water reabsorbs water and emulsifies the greasy matter. These products therefore require a comparatively high scouring temperature followed by cool rinsing. (*Chem. Abs.* **44**, 11130)

**Detergents in the food industries.** J. P. Sisley. *Rev. fermentations et inds. aliment.* **5**, 83-91(1950). A review of numerous detergents and their compatibilities and incompatibilities. (*Chem. Abs.* **44**, 10943).

**Skin compatibility of raw materials and laundering compounds of the powder type.** Lothar Peukert (Imhausen-Forschung, Witten-Ruhr, Ger.). *Fette u. Seifen* **52**, 415-19(1950). The effect on human hand skin of washing with various synthetic detergents (I) and laundering compositions containing I has been examined. A characteristic number, the skin reaction number (II), is introduced which compares the action of I to that of pure soap. II was higher for all I tested than for soap. The presence of sodium carboxymethylcellulose lowered the irritating action of I. (*Chem. Abs.* **44**, 10356)

**The relation between chemical structure and performance of detergents.** D. S. P. Roebuck (Monsanto Chemicals Ltd., Ruabon, N. Wales). *Colloid Chem.* **7**, 529-40(1950). This paper considers detergency, wetting, and penetration, the destruction of the adhesive forces between soil and contaminated surface, and solubilization of the liberated soil. (*Chem. Abs.* **44**, 10356)

**The relationships between constitution and mode of action of soaplike colloidal electrolytes.** A. Chwala (Techn. Univ., Vienna). *Colloid Chem.* **7**, 417-27(1950). This paper gives structural formulas and physical principles underlying the behavior of anionic soaps. The tables classify many well-known synthetic detergents. The effect of synthetic detergents on sewage organisms is considered. (*Chem. Abs.* **44**, 10356)

**A method for determining the properties of micelles.** H. W. Hoyer and K. J. Mysels (Univ. of Southern California, Los Angeles). *J. Phys. & Colloid Chem.* **54**, 966-7(1950). It was found possible to obtain thermodynamic and kinetic data about micelles formed by association colloids by "tagging" the micelles with a minute amount of a solubilized material such as a dye. The average solubilizing micelle in 5% K laurate has effectively 12 negative charges, an equivalent spherical radius of about 25A., and a molecular weight of at most 40,000, corresponding to 170 soap molecules. (*Chem. Abs.* **44**, 8737)

**Detergents for mechanical dishwashing.** C. A. Tyler. *Soap Sanit. Chemicals* **26**, No. 12, 37-9, 90(1950). Review article covering specifications and requirements of dishwashing detergents, conditions of use, physical form, and specific formulations.

**Detergents for printers type.** Paul I. Smith. *Soap Sanit. Chemicals* **26**, No. 12, 44-5 81(1950). Synthetic detergents of the sodium alkyl sulphate type may be used to clean printers type in place of solvents if they meet the following requirements: freely soluble in water of any degree of hardness to form clear solutions, must not hydrolyze and must be stable over a wide pH range, must be efficient at low concentrations, must be noninflammable, non-toxic, and possess a very low volatility.

**Effects of soap formed in situ.** R. Rowe. *Mfg. Chemist* **21**, 470-1(1950). In modern laundry practice it has been found that soap formed in situ by the reaction between fatty acids and alkali on the articles to be cleaned has a much greater cleansing power than ordinary preformed soap. This is true whether the soap is used as such or for emulsifying purposes. Experiments to substantiate this phenomenon are reported but no explanation is given for the greater effectiveness of nascent soap.

**Detergents. I. Surface activity and washing activity.** K. Lindner. *Melliand Textilber* **29**, 203-9(1948). The relations among surface activity, protective colloid action, and detergency are discussed. Measurements of surface and interfacial tension for 27 commercial detergents at various concentrations are shown graphically. (*Chem. Abs.* **44**, 9701)

## PATENTS

**Method of conditioning bar soap for pressing by means of infrared radiation.** R. F. Heald, C. Sutter, and R. D. Compa (Colgate-Palmolive-Peet Co.). *U. S. 2,527,062.* Method of high moisture conditioning bar soap for pressing which comprises exposing a bar of soap to infrared radiation of sufficient intensity and duration to heat it above the maximum pressing temperature and blowing air on the bar to prevent substantial temperature rise and thereby condition the bar for pressing shortly after radiation has terminated.

**Hard water soap-detergent composition.** W. C. Preston (Procter & Gamble Co.). *U. S. 2,527,075.* A detergent composition having a reduced tendency to form sticky lime curd when used in hard water at rinsing dilutions comprises a tenary mixture of a water-soluble soap, a water-soluble salt of an organic sulfuric reaction product having pronounced detergent properties, and a higher aliphatic alcohol selected from the group consisting of primary and secondary saturated and unsaturated higher alcohols having from 10 to 20 carbon atoms.

**Nonionic surface active agents.** Herman B. Goldstein and Armand S. Waldman (Sun Chemical Corp.). *U. S. 2,528,136.* A surface active compound prepared by reacting equi-molecular amounts of methoxy polyethylene glycol and a saturated fatty acid in the presence of a catalyst such as para-toluenesulfonic acid to produce a compound within the acid value range of 26-43, at which range the surface active properties and wetting powers are most efficient.