ABSTRACTS . . . . E. S. Lutton, Editor

• Oils and Fats

R. A. Reiners, Abstractor

Shock waves expel cold fat. Anon. *Chem. Eng.* **60**(2), 118, 120, 122(1953). A description of the Chayen process as applied to bone rendering.

Cold rendering displaces extraction processes. Anon. *Can. Chem. Process* **36**(13), 38, 40, 42(1952). The Chayen process is described.

Determination of trichloroethylene in the oils. D. Bonilauri and C. Carola (Staz. sper. olii, Milan). *Olii minerali, grassi e saponi, colori e vernici* **29**, 35-9(1952). The oil is dissolved in xylene and distilled. To the distilled fraction are added a few drops of pyridine and NaOH. After shaking and heating on a boiling water-bath a red color develops if $CHCl:CCl_2$ is present. The method may be made quantitative with the use of the spectrophotometer. (*Chem. Abs.* **47**, 2511)

Lipide separation methods. Separation of phospholipides from neutral fat and fatty acids. B. Borgstrom (Univ. Lund, Sweden). *Acta Physiol. Scand.* **25**, 101-10(1952). The separation was made by the adsorption technique. Finely ground sucrose is a very good adsorbent for phospholipides from which they can be eluted. However, the capacity of the adsorbent is very small (1 mg./2 g.) and furthermore the adsorbent is partly soluble in the eluent. Silicic acid is superior since it gives fats free from phospholipides and has a high capacity for phospholipides. It is even more effective than acetone precipitation in the separation of phospholipides. The method is especially rewarding with isotopes or with relatively small amounts of fat. (*Chem. Abs.* **47**, 2126)

Lipide separation methods. Separation of cholesterol esters, glycerides, and free fatty acids. B. Borgstrom (Univ. Lund, Sweden). *Acta Physiol. Scand.* **25**, 111-19(1952). Cholesterol esters are separated from glycerides and free fatty acids on silicic acid. The free fatty acids are separated from glycerides in petroleum ether solution by extraction with an alkaline 50% alcohol solution. The ion-exchange resin Amberlite IRA-400 is used for separating C^{14}-labelled free fatty acids from fat containing lower glycerides. (*Chem. Abs.* **47**, 2126)

The determination of impurities in the edible and commercial oils. C. Carocci-Buzi (Ist. Oleificio, Imperia, Italy). *Olii minerali, grassi e saponi, colori e vernici* **29**, 69-73 (1952). The following determinations are proposed: water by heating at 105°; sediment by centrifugation of the solution of the oil in petroleum ether. (*Chem. Abs.* **47**, 2511)

Precipitation of oxidized fatty acids of castor oil with urea. G. N. Catravas and G. Knafo (Inst. corps gras, Paris). *Bull. mens. inform ITERG* **6**, 384-7(1952). Samples of fatty acids of castor oil oxidized with air for 1.5, 4.5, 10.5, 20, 32 hrs., were treated with urea. The filtered and washed precipitates had acid nos. of 191, 196, 196, 176, 174, respectively. The acid nos. of the corresponding liquid fractions from the filtrates were 196, 189, 187, 175, 131. The iodine and hydroxyl nos. indicated dihydroxy and small quantities of tetrahydroxy stearic acids were formed and were both precipitated by urea. Polymer products were not precipitated. (*Chem. Abs.* **47**, 1952)

The behaviour of methyl oleate, methyl linoleate and their oxidation products with urea. G. N. Catravas and G. Krafo. *Oleagineux* **8**, 79-83(1953). A sample of methyl oleate and samples of the same ester which had been treated with pure oxygen for 62 and 70 hours in the presence of ultra-violet light were separated by saturated methanolic solutions of urea into adduct forming fractions of pure methyl oleate and non-adduct forming fractions which contained hydroxyl groups. Samples of methyl linoleate and methyl linoleate which had been oxidized under similar conditions to those used for the oleate also were fractionated with urea. Chemical constants, infra-red curves and ultra-violet data are given for a number of the fractions.

An investigation of the relation of the essential oils of Coronopus didymus to the tainting of butter. D. A. Forss (Dairy Res. Section, C.S.I.R.O., Melborune). *Australian J. Appl. Sci.* **2**, 369-410(1951). *Coronopus didymus* is a cruciferous weed which grows abundantly in the summer rainfall areas in Australia. When eaten by cows a characteristic taint, intensified by heating, is produced in the milk, cream and butter. Evidence presented shows that benzyl mercaptan is probably a major source of the taint.

Determination of moisture in oil seeds. M. Th. Francois and Mrs. M. Juillard (Lab. Chevreul, Paris). *Bull. mens. inform. ITERG* **6**, 427-35(1952). The effects of time of contact, moisture content of the sample, and intensity of the previous crushing on moisture determination of rape seed with CaC_2 are graphically presented. The results were 2-13.5% lower than those by the official oven method. The degree of fineness is very important. The transformation of the seed in agglomerated impermeable paste during crushing of the sample must be avoided. (*Chem. Abs.* **47**, 1951)

Aging of red oils. VI. M. Th. Francois and M. Juillard (Lab. Chevreul, Paris). *Bull. mens. inform. ITERG* **6**, 438-4(1952). After 75 min. in the Mackey apparatus the temperature rose to 100° with oleic acid and methyl oleate and to 280° with ethyl linoleate. Upon continuation of the treatment, 110° was reached in 150 min. with oleic acid and the temperature remained constant for more than 5 hrs. With methyl oleate it remained indefinitely constant at 100°; with ethyl linoleate it began to redescend after 75 min. Linoleic acid showed, respectively, 99, 185, 265, 410° after 20, 25, 30, 45 min. (*Chem. Abs.* **47**, 2509)

Aging of Red Oils. VII. M. Th. Francois and M. Juillard (Lab. Chevreul, Paris). *Bull. mens. inform. ITERG* **6**, 484-7(1952). The decrease of iodine no. of a red oil (iodine no. 80.7) containing 0.2% of antioxidant (diphenylamine, β-naphthol, butylcresol) upon oxidation during 50 hrs. at 80° with a current of air, is plotted against time. The curves show 2 levels: the first at iodine no. of about 75 for 15-18 hrs. begins 2-4 hrs. after starting the oxidation; the second iodine no. 57-61 lasts until the end of the test. These results permit evaluation of approximate composition of the red oil. Mackey tests of the sample with and without antioxidants are tabulated. (*Chem. Abs.* **47**, 2510)

Colorimetric estimation of higher fatty acids as their uranyl soaps. R. Goiffon, B. Goiffon and F. Kerleo. *Ann. biol. clin.* (Paris) **10**, 422-4(1952). Fecal fatty acids are extracted with acetone, precipitated as the uranyl salts, and their concentration is established by colorimetric determination of the metal. (*Chem. Abs.* **47**, 2240)

The branched-chain fatty acids of mutton fat. 2. The isolation of (+)12-methyltetradecanoic acid and of 13-methyltetradecanoic acid. R. P. Hansen, F. B. Shorland and N. J. Cooke (Dept. Sci. Ind. Res., Wellington, N. Z.). *Biochem. J.* **53**, 374-78(1953). These acids were isolated from the external fatty tissue of sheep. The *ante-iso* acid is probably present in quantities greater than 0.04% of the total weight of fatty acids.

Recent advances in fatty acid technology. B. J. Henderson. *Can. Chem. Process* **36**(13), 44, 46, 48(1952). A brief review.

Manufacture of hardened oil. H. Higashi (Fishers Expt. Sta., Tokyo). *Shokuryo no Kagaku* (Sci. of Foods) **2**, 86-8(1948). (*Chem. Abs.* **47**, 2511)

The components acids and glycerides of Camelina sativa seed oil and its relation to other cruciferous oils. J. Holmberg and G. Sellmann (Forskningslaboratoriet LKB, Appelviken, Sweden). *Svensk Kem. Tid.* **64**, 270-9(1952). A sample of *Camelina sativa* seed oil (dodder oil) from the 1950 Swedish crop was investigated. The acids of *Camelina sativa* seed oil in % of total acids were: palmitic 5.2; stearic 1.8; arachidic 1.2; behenic 0.6; hexadecenoic 2.4; oleic 23.9; linoleic 14.5; linolenic 33.4; eicosenoic 13.8; erucic 3.2; and a trace of myristic acid. (*Chem. Abs.* **47**, 2514)

Free radical and infrared studies of some tocopherols and other 6-hydroxychroman antioxidants. G. E. Inglett (State Univ. of Iowa, Iowa City). Univ. Microfilms (Ann Arbor, Mich.). Pub. No. 4073, 93 pp. (*Chem. Abs.* **47**, 1949)

The acid and alkaline hydrolysis of glycerides in homogeneous systems. H. H. G. Jellinek (Univ. Adelaide). *Revs. Pure & Appl. Chem.* (Australia) **2**, 139-62(1952). Review with 46 references. (*Chem. Abs.* **47**, 1951)

Volumetric determination of the water content of fats and glycerol. H. P. Kaufman (Chem. Landes-Untersuchungsamt Nordrhein-Westfalen, Münster, Ger.). *Pharm. Zentralhalle* **91**, 379-83(1952). For the determination of moisture in light-colored fats the volumetric method of Kaufman and Funke and a modified Fischer method gave good results. The latter is preferred for moisture content below 12%; otherwise either gives good results. (*Chem. Abs.* **47**, 1951)

Biosynthesis of fats from saccharides in yeasts. IV. Metabolism of the yeast Rhodotorula gracilis on glucose, d-xylose, and sodium acetate. A. Kleinzeller and J. Malek (Tech. Univ., Prague, Czech.). *Chem. Listy* 46, 674-8(1952). Glucose is assimilated much more rapidly than xylose by yeasts which have not been adapted to the cultivation medium. The yeasts adapted to xylose assimilate it almost as fast as glucose. The conversion coefficient with xylose is much lower than with glucose. (*Chem. Abs.* 47, 2257)

The stereochemistry of ante-iso-acids. W. Klyne (Postgraduate Med. School, London, W. 12). *Biochem. J.* 53, 378-79(1953). The (+)-*ante-iso*-alkanoic acids are represented by a Fischer projection formula and may be termed L-methyl-substituted acids.

Influence of ultraviolet rays on flour. VIII. The fatty substances. E. Maes and S. van den Driessche (Ministère des affaires écon., Brussels, Belg.). *Congr. intern. inds. agr. 9th Congr., Rome,* 1952, 17 pp. From 4.5 to 5 g. "fat" was obtained with petroleum ether from 500 g. of flour. The fat or the solution in $CHCl_3$ was irradiated at 253.7 mμ. The absorption spectrum, the iodine no., and the acidity show that the effect of ultraviolet rays is due to destruction of carotenoids, isomerization of fats, oxidation (by activation of 0) especially at the double bonds, and saponification. (*Chem. Abs.* 47, 2391)

Fatty oil from the seeds of Ocimum sanctum. G. B. Nadkarni and V. A. Patwardhan (Willingdon Coll., Sangli). *Current Sci.* (India) 21, 68-9(1952). Extraction of the seeds with ethyl ether yields 17.8% of greenish yellow oil d^{30} 0.9063, n^{30} 1.4789, acid no. 2.0, saponification no. 181.7, iodine no. 173.0, SCN no. 104.6, acetyl no. 12.1, Reichert-Meissl no. 1.2, Polenske no. 0.2, Hehner no. 93.6, unsaponifiable 2.3%. The fatty acids are palmitic 6.9, stearic 2.1, linolenic 15.7, linoleic 66.1, and oleic 9.0%. Sitosterol is present in the unsaponifiable material. A thin film of oil on glass dries hard in 4 days. (*Chem. Abs.* 47, 2515)

Oil splitting by the Twitchell method and the treatment of sweet water. I. Tallow splitting by dibutyl naphthalenesulfonic acid and the treatment of sweet water. A. Nagata, M. Ebara and S. Igarashi. *J. Chem. Soc. Japan,* Ind. Chem. Sect. 54, 169-71(1951). The loss of glycerol during the course of refining the sweet water of the Twitchell method is as small as that from the autoclave hydrolysis. (*Chem. Abs.* 47, 1951)

Antioxidants for shark-liver oil. I. Protective action of inhibitol extracts and certain inorganic compounds on substrates of shark-liver oil. P. V. Nair and T. A. Ramakrishnan. *Bull. Central Research Inst. Univ. Travancore,* Ser. A., *Phys. Sci.,* 2, 77-85(1952). Extracts of *Mucuna pruriens,* rice meal, peanut-oil cake, and sesame-oil cake did not inhibit oxidative deterioration in shark-liver oil. When shark-liver oil was saturated with N_2O, there was an initial drop in peroxide formation until the 3rd day, but no further drop occurred. KCN alone acted as a prooxidant. Water, up to 10% by weight of shark-liver oil, resulted in an increase in peroxides to the 6th day, but no further increase occurred. (*Chem. Abs.* 47, 2511)

Antioxidants for shark-liver oil. II. Effect of certain organic compounds. P. V. Nair and T. A. Ramakrishnan. *Bull. Central Research Inst. Univ. Travancore,* Ser. A., *Phys. Sci.* 2, 86-99(1952). Of the hormones, adrenaline, anterior pituitary extract, thyroxine, and posterior pituitary extract, only the last inhibited oxidation of shark-liver oil, i.e., it increased the induction period from 10 to 14 days. Peanut, sesame, and coconut oils had very little effect as inhibitors, nor did plantain and tapioca flours or ginger starch. Of the other compounds tested it was the di- and polyhydric phenols having two OH groups in the o- and p-positions which were the most effective antioxidants. (*Chem. Abs.* 47, 2511)

Antioxidants for shark-liver oil. III. Effect of gallanilide. P. V. Nair and T. A. Ramakrishnan. *Bull. Central Research Inst. Univ. Travancore,* Ser. A., *Phys. Sci.* 2, 100-2(1952). Gallanilide was an excellent antioxidant for shark-liver oil, and 30 p.p.m. was sufficient to prolong the induction period and maintain the vitamin A potency. (*Chem. Abs.* 47, 2511)

Rice bran. Y. Nakanishi. *Shokuryo no Kagaku* (Sci. of Foods) 2, 90-6(1948). Chemical compositions of rice bran, rice-bran oil, rice-bran wax, and rice-oil soap are described. (*Chem. Abs.* 47, 2511).

Chromatic reactions of sesame oil. I. Reaction with acetic anhydride and sulfuric acid in the presence of furfural. L. Pavolini and R. Isidoro (Lab. chim. provinciale, Ancona, Italy). *Olii minerali, grassi e saponi, calori e vernici* 28, 137-40(1951). Shaking sesame oil with acetic anhydride and adding a few drops of furfural (2% alcohol solution) and concentrated H_2SO_4 gives a brilliant red color which turns to blue-green. The reaction is due to sesamin. (*Chem. Abs.* 47, 2514)

Chromatic reactions of sesame oil. II. Reactions of sesamol and sesamin. L. Pavolini and R. Isidoro (Lab. chim. provinciale, Ancona, Italy). *Olii, minerali, grassi e saponi, colori e vernici* 28, 140-2(1951). The color reactions of sesamin and sesamol are given. (Chem. Abs. 47, 2514)

Chromatic reactions of sesame oil. III. The identification of sesame oil after catalytical hydrogenation. L. Pavolini and R. Isidoro (Lab. chim. provinciale, Ancona, Italy). *Olii minerali, grassi e saponi, colori e vernici* 29, 33-5(1952). During catalytic hydrogenation sesamin and sesamol are partially decomposed. The small amounts of sesamin remaining even from mixtures with only 5% sesame oil, are sufficient to give the Pavolini reaction. (*Chem. Abs.* 47, 2514)

Identification of isooleic acids present in hydrogenated fats by paper chromatography. S. S. Phatak, A. P. Nahadevan and V. N. Patwardhan (Indian Council Med. Research, Coonoor). *Current Sci.* (India) 21, 162-3(1952). Ether esters of the fatty acids from hydrogenated fat were oxidized in acetone solution and the dibasic acids separated from the monobasic acids by distillation in vacuum. Acids identified from hydrogenated fat were suberic, azelaic, sebacic, undecanedicarboxylic and dodecanedicarboxylic acids, indicating the presence of double bonds at the 8-, 9-, 10-, 11-, and 12-C of the C_{18} acids in the hydrogenated fat. (*Chem. Abs.* 47, 2509)

Selection of solvents. G. P. Pinto (Inst. agron. norte, Belem, Brazil). *Bol. tec. inst. agron. norte* (Belem, Brazil) 22, 7-34 (1950). Of the industrial solvents, the most efficient and most selective for babassu oil is ligroin; for palm and palm-kernel oils, petroleum ether. For all 3, benzene has the greatest solvent power. For laboratory use, acetone is the most efficient and most selective solvent for babassu and palm-kernel oil, and chloroform for palm oil; butanol has the greatest solvent power for babassu and palm oil, chloroform for palm-kernel oil. (*Chem. Abs.* 47, 2515)

Constituents of Centaurium umbellatum. II. The petroleum-ether extract. W. Poethke, W. Arnold and A. Wilhelm. *Arch. Pharm.* 284, 385-99(1951). The petroleum ether-soluble acids consisted of 47.7% solid acids (identified as stearic, palmitic, and cerotic) and 43.3% liquid acids (oleic, linoleic, and linolenic). The petroleum ether extract contained 40% unsaponifiables; these contained a new sterol, $C_{27}H_{46}O$, white needles, m. 190-1° (from ethanol), $[\alpha]^{20}$ 85.1° ($CHCl_3$), for which the name erythrosterol is proposed. (*Chem. Abs.* 47, 2191)

Chemical examination of the fatty oil from the seeds of Mallotus phillipinensis. S. V. Puntambekar (Forest Research Inst. & Coll., Dehra Dun). *Proc. Indian Acad. Sci.* 35A, 57-68(1952). The seeds contain 22-24% of a pale, bland, viscous oil superior in drying properties to tung oil. The constants are: sp. gr. (30°) 0.9347, n^{30} 1.5105, unsaponifiable (sitosterol) 1.75%, acid no. 5.7, saponification no. 178.3, iodine no. (Hanus) 183.2, acetyl no. 49.2. The mixed acids in the unpolymerized state are: oleic 28.6, linoleic 2.4, polyethenoid keto C_{18} 25.7, isomeric eleostearic 38.4, saturated 4.9%. (*Chem. Abs.* 47, 2511)

Utilization of oil cakes, seed hulls, and other co-products of vegetable oils and oil seeds. T. V. S. Rao (Tata Oil Mills Co., Bombay). *Indian Soap J.* 18, 90-100, 134-48(1952). A review with 62 references. The iodine values, sources, and uses of 139 fatty oils are tabulated. (*Chem. Abs.* 47, 1951)

Interesterification of some fats and oils at low temperature. Y. Toyama and C. Yamaguchi (Nagoya Univ.). *J. Chem. Soc. Japan,* Ind. Chem. Sect. 54, 188-90(1951). Interesterification according to Eckey was applied to peanut, rice bran, and coconut oils. $NaOCH_3$ suspended in xylene is recommended as a catalyst. Addition of glycerol to the catalyst caused formation of mono- and diglycerides and raises the cloud and cold points. (*Chem. Abs.* 47, 1951)

Methods of fat determination. D. Schlenk. *Pharm. Ztg.-Nachr.* 88, 802-3(1952). The use of the butyrometer for the determination of fats in emulsions, feces, blood, etc., is advocated (*Chem. Abs.* 47, 1949)

The gaseous phase of butter. P. Shebanin (S. M. Kirov Agr. Inst., Omsk). *Molochnaya Prom.* 13, No. 11, 35-8(1952). Examination of the gas phase present in bubbles within a mass of butter by heating the selected specimens in a microeudiometer showed that in storage the gas phase does not contain more than 0.5-0.6% CO_2 after storage at 8-10°, while the O_2 content drops from 20% to 3.8-4.5% within 6 days. As O_2 was consumed, the quality of butter (taste grade) dropped. (*Chem. Abs.* 47, 1859)

Consistency of hardened fats. P. Soltoft. *Proc. Intern. Rheol. Congr.* **1948**, II, 273-9; III, 72-4(1949). Extrusion of strongly worked shortening through capillaries (length l 100 mm., diameter 1 to 5 mm.) under a constant air pressure P at constant temperature gives consistency curves (plots of $4\ V/\pi r^3$ vs. $Pr/2l$ where V is the rate of outflow and r the capillary radius) which are almost independent of r and l. Shortenings high in solids are stiff enough to show a linear region of slow (plug) flow after the yield value is exceeded, as well as a region of much faster flow at high pressures. (*Chem. Abs.* **47**, 2509)

Some constituents of the seed of Raphanus sativus. A. Sosa and R. Duperon. *Compt. rend.* **235**, 82-4(1952). Seeds of *Raphanus sativus* (radish) are treated with boiling 95% ethanol; then ether is added to yield an ether layer containing an oil which was found to contain hydrocarbons, sterols and pigments. (*Chem. Abs.* **47**, 2512)

Micromethod for the determination of total lipides in serum. B. Swahn (Univ. Lund, Sweden). *Scand. J. Clin. & Lab. Invest.* **4**, 247-9(1952). Serum (0.02 ml.) is air dried on Whatman No. 1 filter paper which is then soaked 60 min. in alcoholic Sudan black, washed 3 times for 15 min. in 50% ethanol and dried in air. The serum appears as a blue or blue-black spot. The spot is cut out and extracted 30-60 min. with 25% acetic acid in ethanol and the extinction read at 590 mμ. The lipide concentration is read from a calibration curve. (*Chem. Abs.* **47**, 1766)

Studies of the industrial preparation of higher fatty acid amide and its purification. I. Synthesis of higher fatty acid amide under atmospheric pressure. T. Yoshizaki (Nichiwa Sangyo Co.). *J. Chem. Soc. Japan*, Ind. Chem. Sect. **54**, 186-8(1951). The proper temperature and the amount of NH_3 gas for the preparation of palmitic amide from palmitic acid under atmospheric pressure was determined. The temperature range 160-200° was favorable. The reaction velocity increases at first with the amount of NH_3 and gradually reaches a constant value. Silica gel is found to be an active catalyst. Unsaturated fatty acid distilled from rice bran gave satisfactory results as a raw material. (*Chem. Abs.* **47**, 1950)

Utilization of oil-refinery refuse. J. P. Verma (Natl. Chem. Lab., Poona). *Indian Soap J.* **18**, 55-7(1952). The feasibility of extracting tocopherols (vitamin E) from the wastes and by-products of the fatty oil industry is discussed. The oils contain the following percentage of tocopherols: babassu (crude) 0.003, castor 0.05, coconut (refined) 0.003, corn (refined) 0.095, cottonseed (crude) 0.110, cottonseed (refined) 0.090, lard (prime steam) 0.0005, oleo oil 0.002, olive 0.020, palm (crude) 0.050, peanut (crude) 0.052, peanut (refined) 0.048, pecan (refined), 0.045, rice bran (crude) 0.100, rice bran (refined) 0.090, safflower (crude) 0.080, sesame (refined) 0.050, soybean (refined) 0.110, wheat germ (crude) 0.40, and wheat germ (solvent-extracted) 0.55. (*Chem. Abs.* **47**, 1951)

Grapeseed oil from Sardinian grapes. F. Vodret (Univ. Cagliari, Italy. *Rend. seminar. facolita sci. univ. Cagliari* **20**, 215-22 (1950). An attempt to improve a badly processed Sardinian grape-seed oil by extraction with acetone was unsuccessful because of low yields (30%). Characteristics of the oil are given. (*Chem. Abs.* **47**, 1952)

Determination of arsenic of aliphatic and aromatic arsenic compounds in poisonous fats. F. Watzinger. *Z. Lebensm-Untersuch. u. -Forsch.* **95**, 313-15(1952). For determining As in fats containing As pesticides, the decomposition of the sample with H_2SO_4 and Perhydrol is recommended in place of the more tedious Kjeldahl decomposition. (*Chem. Abs.* **47**, 2082)

Chemistry of the lipides of posthemolytic residue or stroma of erythrocytes. III. Globoside, the sugar-containing lipide of human blood stroma. T. Yamakawa and S. Suzuki (Tokyo Univ.). *J. Biochem.* (Japan) **39**, 393-402(1952). From 25 g. of human blood stroma 0.7 g. of a sugar-containing lipide, globoside, has been isolated. The globoside has the following properties: colorless, fairly hygroscopic spherocrystals, sinters at 200°, m. 224° (decomposition); C 64.1-64.3, H 10.3-10.4, N 2.02-2.07%; sugar(as galactose) 42-44, hexosamine (as glucosamine·HCl) 9.03-9.22; acetyl (after 50% hydrolysis) 2.16-2.82%; $[\alpha]^{18} = +10.3°$. Hydrolysis of the globoside yields lignoceric and nervonic acids, D-galactose, chondrosamine, and sphingosine-like substance. The structure of this globoside is proposed to be a mixture of lignoceryl- (or nervonyl-)-sphingosine-digalactoside ($C_{54}H_{103}NO_{13}$) and of lignoceryl- (nervonyl-)-sphingosine-acetylchondrosamine-digalactoside ($C_{62}H_{116}N_2O_{18}$). (*Chem. Abs.* **47**, 2223)

Fat splitting by autoclaving. II. Splitting of coconut oil by autoclaving in the presence of hydrogen. C. Yonese. *J. Chem. Soc. Japan,* Ind. Chem. Sect. **54**, 53-5(1951). In autoclaving coconut oil with no catalyst in the presence of H at 180-5°, splitting in a common steel autoclave was greater than in stainless steel. A small quantity of iron from the vessel may act as a catalyst. (*Chem. Abs.* **47**, 2515)

Fat splitting by autoclaving. III. Splitting of coconut oil by stainless steel autoclave with no catalyst and the mechanism of the splitting. C. Yonese. *J. Chem. Soc. Japan*, Ind. Chem. Sect. **54**, 55-7(1951). Stepwise splitting may take place during the course of autoclaving. (*Chem. Abs.* **47**, 2515)

Mechanism of fat splitting by autoclaving. III. Detection of the intermediate products in coconut-oil splitting by means of chromatography. C. Yonese. *J. Chem. Soc. Japan*, Ind. Chem. Sect. **54**, 50-1(1951). Isolation of the intermediate products such as monoglycerides and diglycerides was studied by means of chromatography of the fraction obtained by molecular distillation. Monolaurin, m. 50°, was detected in the fraction $b_{0.001}$ 140°, and dilaurin in the fraction $b_{0.001}$ 170°. (*Chem. Abs.* **47**, 2515)

Mechanism of fat splitting by autoclaving. IV. Detection of the intermediate products in coconut-oil splitting by high-vacuum distillation. C. Yonese. *J. Chem. Soc. Japan*, Ind. Chem. Sect. **54**, 51-3(1951). α-Monolaurin was isolated by the redistillation, under 0.5 mm. at 180-200°, of the distillate having the highest acetyl value. (*Chem. Abs.* **47**, 2515)

Fundamental problems in relation to improvement of oil yields. Pressing of rape and peanut oils. J. Yasuda. *Shokuryo no Kagaku* (Sci. of Foods) 3, 27-31(1949). (Chem. Abs. **47**, 2511)

The concentration of a vegetable oil-ligroin mixture in a long-tube vertical evaporator. C. Zancani (Univ. Ansaldo S. A., Genoa, Italy). *Chimica e industria* (Milan) **34**, 454-9(1952). The advantages of the Kestner-type climbing-film evaporator for concentrating solutions of vegetable oils in ligroin (b. 26.5-62.0) are demonstrated with pilot-plant tests. (*Chem. Abs.* **47**, 2514)

PATENTS

Process of treating phosphatides and product. P. L. Julian, H. T. Iverson and Marian McClelland (Glidden Co.). *U. S. 2,629,662.* A process is claimed which comprises treating in aqueous medium an unsaturated phosphatide with hydrogen peroxide, or an edible water-soluble lower hydroxycarboxylic acid, or the peracids of these hydroxycarboxylic acids. Hydroxylation is continued until the iodine number has been reduced by 5-25%.

Process for treatment of gossypol in solvent-extracted cottonseed meal. M. Bonotto. *U. S. 2,631,099.* A process is claimed for treatment of solvent-extracted cottonseed meal to reduce the gossypol content thereof to safe feeding proportions consisting of adding to the solvent-extracted meal sulphur dioxide in a proportion capable, with moisture and heat, of reducing the proportion of gossypol, and also subjecting the meal to moisture and heat during a conveying movement of the meal.

Treatment of glyceride oils and the resulting product. K. F. Mattil (Swift & Co.). *U. S. 2,631,156.* An improved method is claimed of separating a glyceride fatty material into higher and lower melting point constituents, which comprises dispersing throughout a liquefied glyceride fatty material a small amount of a sulphide of a high molecular weight alkyl substituted aryl ether carboxylic acid salt, cooling the fatty material to crystallize the higher melting point constituents, and then separating the constituents, the crystals of higher melting point constituents formed on cooling being firmer and better defined to facilitate separation from the lower melting point constituents.

Fractionation of triglycerides. A. W. Hixson and R. Miller (The Chemical Foundation, Incorp.). *U. S. 2,631,157.* An unbodied fatty oil containing a mixture of relatively saturated and relatively unsaturated triglycerides is fractionated in liquid propane.

Process for separating oil-soluble substances. J. Boldingh (Lever Bros. Co.). *U. S. 2,632,012.* A process is claimed for the removal from solution of materials dissolved in glyceride oils by contacting the solution with finely divided solid rubber which absorbs the minor constituent.

Dehydrating castor oil. Compagnie des vernis Valentine et Schueller (R. Bertaut and E. Kahneman, inventors). *Fr. 975,-050.* Castor oil is heated with a chloride of an alkaline earth metal, Al or Zn, preferably in the presence of a solvent, such as ethanol. (*Chem. Abs.* **47**, 1955)

γ-Alkylthio or -selenyl fatty acids and their α-amino derivatives. Knoll A.-G. Chemische Fabriken (H. Plieninger, inventor). *Ger. 816,544.* A process of preparing γ-alkylthio- or -selenyl fatty acids or their α-amino derivatives comprises heating alkali or alkaline-earth metal mercaptides or selenides with γ-lactones at elevated temperatures, preferably 100-200°, possibly in the presence of inert solvents such as benzene or toluene. (*Chem. Abs.* 47, 2200)

Catalyst for hydrogenation. T. Iijima (Kawaguchi Chem. Ind. Co.). *Japan, 2224('51).* $NiCO_3 \cdot 2Ni(OH)_2$-kieselguhr is reduced in H at 400°, the product poured into 100 ml. 0.01 *N* H_2O_2, let stand 1 hr., and dried to make a catalyst stable in air; hydrogenation of whale oil (iodine no. 110) with 5% of the catalyst 4-8 hrs. at 150° and 30 atmosphere gives a product having iodine no. 10-20 and m. 50-5°. (*Chem. Abs.* 47, 2519)

Ester interchange of fats and oils. S. Yoda (Nitto Chemical Industries Co.). *Japan. 2425('51).* A solution of KOH 1, methanol 1, and xylene 2 parts is shaken with 100 parts cuttlefish oil (acid no. 2) for several min. at room temperature, let stand for 20 hrs. at 10° and washed with warm water. The xylene is removed by steam-distillation in vacuo. The oil is dehydrated and gives a cloud point 19° (untreated oil showed 2°). Treatment of this oil with petroleum ether and allowing it to stand at —2° gave 8% solid fat (untreated oil gave no solid fat). (*Chem. Abs.* 47, 1954)

Decolorization of rice oil. Y. Mochida. *Japan. 3317('51).* Rice oil is treated with 3% 55° Bé. H_2SO_4 diluted with ⅓ weight of water, stirred for 5 hrs. at 30°, and the oily layer is separated and heated 3 hrs. at 90-100° with 1-5% Zn powder. (*Chem. Abs.* 47, 1955)

Hydrogenation of fats and oils. S. Ueno. *Japan. 3319('51).* Soybean oil (50 g.) in an autoclave with 0.5 g. Ni-Cu carbonate and 14-15 atmospheres of H is heated for 30 min. at 180° to give a product with iodine no. 1.21 and melting point 66.6°. The addition of 0.25 g. $CaCO_3$ in this reaction shortened the time of reaction to 20 min. to obtain the same product. (*Chem. Abs.* 47, 1954)

Emulsifying agent. T. Yamada. *Japan. 4410('51).* The foots from soda refining of vegetable oil, e.g. soybean or rapeseed oil, are mixed with 3-6% Na_2HPO_4, 2-3% casein or lecithin, and 3-8% Na_2CO_3. The mixture is agitated 1 hr. at 50-60°. (*Chem. Abs.* 47, 2518)

Dewaxing of rice oil. M. Hitotsumatsu, *et al. Japan. 4124 ('51).* Gelatin (5 kg.) in 100 kg. water at 20° is mixed with 50 kg. crude rice oil at 20°, stirred for 10 min., the lower layer, emulsified oil, is mixed with 100 kg. ethylene glycol, heated at 40°and centrifuged to give 37 kg. dewaxed oil; the upper layer, sludge, is washed with hot water and centrifuged to give 13 kg. wax oil; the ethylene glycol is recycled. (*Chem. Abs.* 47, 2518)

Viscous oil. S. Matsumoto. *Japan. 4125('51).* Hydrogenated squalene (100 g.) with iodine no. 98.7 is heated with 100 g. glacial acetic acid and 30 g. 30% H_2O_2 for 8 hrs. at 100°, the acetic acid removed, and the oil washed with aqueous NaOH to give a viscous oil m. $<-30^{\circ}$ with viscosity 376 sec. at 50° (Redwood). (*Chem. Abs.* 47, 2199)

• Biology and Nutrition

R. A. Reiners, Abstractor

Long-chain unsaturated fatty acids as essential bacterial growth factors: further studies with corynebacterium "Q". B. W. Boughton and M. R. Pollock (Nat. Inst. Med. Res., Mill Hill, London, N. W. 7). *Biochem. J.* 53, 261-65 (1953). Results show that unsaturated fatty acids with chain length of 2 carbons longer, or 4 carbons shorter than oleic acid or with the double bond one or two atoms nearer the carboxyl than the 6:7 position are incapable of replacing oleic acid for the growth of this organism. Within these limits oleic acid can be replaced by several fatty acids with either *cis* or *trans* configuration.

Erucic acid as the factor in rape oil affecting adrenal cholesterol in the rat. K. K. Carroll (Univ. West. Ontario, London, Canada). *J. Biol. Chem.* 200, 287-92(1953). The increase in adrenal cholesterol resulting from feeding rape oil to rats has been shown to be produced by erucic acid. Among other fatty acids tested only nervonic acid gave a response comparable to that of erucic acid.

Formation of partial glycerides during the lipolysis of triglycerides in the intestine. P. Desnuelle and M. J. Constantin (Faculte sci., Marseille, France). *Biochim. et Biophys. Acta* 9, 531-7(1952). The course of hydrolysis of triglycerides in the rat and dog was studied by using microtechniques to follow the liberation of free acids, diglycerides, monoglycerides, and glycerol. Partial glycerides are among the lipides in the intestine during the period of digestion of triglycerides. Ca ions in the digestive tract cause an increase in the proportion of monoglycerides and a decrease in the diglycerides, the same effect that Ca ions produce during *in vitro* lipolysis. About the same proportions of acids and mono- and diglycerides are found with *in vivo* and *in vitro* digestion of triglycerides. *In vivo* and *in vitro* lipolysis are both incomplete, and the acids and partial glycerides produced during *in vivo* digestion are absorbed simultaneously. (*Chem. Abs.* 47, 2323)

Quality and stability of turkeys as a function of dietary fat. A. A. Klose, H. L. Hanson, E. P. Mecchi, J. H. Anderson, I. V. Streeter and H. Lineweaver (West. Reg. Res. Lab., Albany, Calif.). *Poultry Sci.* 32, 82-88(1953). Groups of Bronze turkeys were fed a fat-free basal diet supplemented with 2% beef fat, corn oil, soybean oil, linseed oil and sardine oil. The degree of fishy off-flavor was directly related to the amount of highly unsaturated (3 or more double bonds) fatty acids in the carcass fat. The tendency of the fat to deteriorate may be predicted in part from the fatty acid composition of the carcass fat.

Absorption of olive oil and paraffin oil from the intestine of the rat. E. Leupin and F. Verzar (Univ. Basel, Switz.). *Helv. Physiol. et Pharmacol. Acta* 10, C17-18(1952). The oils were mixed in equal parts; 2 ml. of the mixture was given by stomach tube, and the intestinal contents were examined 6-24 hrs. later. Absorption of the olive oil was 43-89%, and of the mineral oil 6-7%. (*Chem. Abs.* 47, 2291)

The importance of the homogenization of milk and the monoglyceride emulsion on the fat resorption in small children. C. A. Sager (Stadt. Krankenhaus Sud, Lubeck, Ger.). *Z. Kinderheilk.* 71, 541-8(1952). Mono- and diglycerides possess an emulsifying action. Clinical determinations show a better fat absorption with "moro-milk" emulsified with monoglycerides than with plain moro milk. Homogenization does not influence the speed of absorption. It appears that not the size of the fat droplets but their surface action is important for the digestion in the infant. (*Chem. Abs.* 47, 1803)

• Drying Oils

Stuart A. Harrison, Abstractor

Effect of gamma, X- and ultraviolet radiation on the stress-strain properties of soya-alkyd films. L. L. Carrick, J. T. Banchero, and A. J. Permoda. *Official Digest Federation Paint and Varnish Production Clubs* No. 337, 105(1953). The stress-strain values on free, unpigmented soya-alkyd films were determined after irradiation with different wave length radiation. Gamma, Beta, and X radiations do not materially affect the stress-strain relationships. Ultraviolet irradiation causes a progressively increasing breaking stress accompanied by a decreasing elongation and toughness.

The testing of impregnating insulating varnishes—3. H. W. Chatfield. *Paint Manuf.* 23, 51(1953). This concludes the review of methods of testing insulating varnishes.

Developments in the paint industry for 1952. Part. III. G. S. Cook. *Paint and Varnish Production* 43, No. 3, 23(1953). This is the final part of a review of the coating industry for 1952.

Electrolytic-microscopic study of porosity of coating films. T. Eich. *Deut. Farben-Z.* 6, 441(1952). A clean sheet iron test panel is coated with 2 to 3 films of coating and dipped into copper sulfate-sulfuric acid solution of pH 2. The iron panel is attached to a copper sheet which also dips into the solution. The porosity of the test panel is noted directly on the voltmeter. The current is run from about 2 to 10 minutes depending on type of coating. The copper deposited in the pores of the film can be examined by eye or microscope. (*Chem. Abs.* 47, 1947)

Developments in fungicide-containing paints. P. P. Hopf. *Paint Manuf.* 23, 48(1953). The use of fungicides in paint formulations is discussed. The requirements and important uses of fungicide paints are discussed.

The application to rust-inhibiting paints of cameline oil and stand oil made from it. I. Cameline oil stand oils. J. D. v. Mikusch. *Deut. Farben Z.* 6, 391(1952). Cameline oil was bodied at 300 and 320° to a viscosity (at 20°) of 70-75. China wood oil was bodied to a viscosity of 53 at 300° then 20 parts more of C.W.O. added and mixture heated to 270° and cut back with 20 parts of cameline oil. These two products plus drier were compared to linseed oil bodied to a viscosity of 70. The cameline stand oil remained tacky for days. However, the mixture with tung oil dried as rapidly as linseed stand oil. (*Chem. Abs.* **47**, 1946)

Polyhydric alcohols. *Paint, Oil, Chem. Rev.* **116**, No. 5, 12 (1953). Review of chemistry and technology of a group of polyhydric alcohols which are in use, or which have been proposed for use in the protective coating field.

PATENTS

Long oil alkyd resins. F. G. Lum. *U. S. 2,627,508.* High viscosity, long oil alkyds are prepared with isophthalic acid instead of phthalic anhydride. These modified alkyds have better properties than corresponding alkyds made with phthalic anhydride.

Linoleum binder containing esters formed by reacting unsaturated drying oil fatty acids and hydroxy alkyl ethers of polyhydric alcohols. C. T. Fiscella. *U. S. 2,629,668.* The flexibility of a linoleum binder is improved by incorporating one or more hydroxyl alkyl ethers of polyhydric alcohols in the mixture prior to bodying.

Three-component copolymers of drying oils, cyclopentadiene, and terpene hydrocarbons. H. L. Gerhart. *U. S. 2,630,415.* Drying oils of enhanced drying powers are obtained by cooking a drying or semi-drying oil with a copolymer of cyclopentadiene and a terpene.

Drying oil composition. R. H. Rosenwald. *U. S. 2,630,438.* Aromatic furoxanes and aromatic furazanes are added to drying oils to retard skinning, e. g., benzofuroxan and benzofurazan when added in 0.1% concentration to tung oil or bodied linseed oil, act as antiskinning agents.

Copolymers of unsaturated esters of phthalic acid. D. Swern and E. F. Jordan. *U. S. 2,631,141.* Unsaturated esters of phthalic acid such as dialkyl phthalate are copolymerized with unsaturated fatty esters such as allyl stearate to give copolymers useful in coating compositions, plastics, etc.

Catalysts for curing of oils. *Austrian 170,613.* Novel catalysts for the curing of drying and semi-drying oils, including fish oils, by isomerization are made by subjecting nickel silicate and a sulfur containing nickel compound to reduction with hydrogen. This is generally done at higher temperatures to give a catalyst with less than 10% sulfur. The catalyst is used to produce stand oils from raw oils. (*Chem. Abs.* **47**, 2508)

• Waxes

R. L. Broadhead, Abstractor

Japan wax. Decoloration of Japan wax. Jotaro Kato and Yoshiaki Nagano (Kyushu Univ., Fukuoka). Kogaku Iho, *Kyushu Univ. (Technol. Rept., Kyushu Univ.)* **24**, 34-8(1951). In comparative study on the various methods of decolorizing crude Japan wax by adsorption, passing 5-25% C_6H_6 solution chromatographically through the activated carbon was best. (*Chem. Abs.* **47**, 1409)

The structure of glycerides of dibasic acids in Japan wax. Jotaro Kato and Yoshiaki Nagano (Kyushu Univ., Fukuoka). Kogaku Iho, *Kyushu Univ. (Technol. Rept., Kyushu Univ.)* **24**, 38-43(1951). The structure was discussed with relation to the character of chromatographic fractions of Japan wax. It is suggested that a glycerol radical is attached on both ends of the acid. (*Chem. Abs.* **47**, 1409)

Modern furniture polishes. Milton A. Lesser. *Soap Sanit. Chemicals* **28**, No. 12, 162-3, 165, 167, 205(1952). A review with formulas covering wax emulsion, straight wax, silicone, and insecticide polishes. 29 references. (*Chem. Abs.* **47**, 1409)

Are solvent-containing strewable floor waxes patentable? Siegfried Lohmann. *Seifen-Öle-Fette-Wachse* **79**, 65, 89(1953). The so-called strewable floor waxes containing a solvent already have been on the market for a few years and considerable research is being conducted to improve them. The reasons for and against the patentability of such products are discussed.

Waxes for packaging purposes. Hubert Lux. Verpackungs. *Rundschau* **No. 6**, 225-6(1952). The properties and suitability of paraffin and plant and animal waxes for impregnating and laminating papers to be used in the packaging industry are discussed. (*Chem. Abs.* **47**, 1385)

The detection of additives in vegetable waxes. The use of instrumental analysis. Charles J. Marsel, Cyril S. Treacy, Howard Brenner, and Frank De Long (New York Univ., New York). *Soap Sanit. Chemicals* **28**, No. 11, 127, 129, 131; No. 12, 181, 183, 185(1952); cf. *C.A.* **45**, 8276c. The use of the refractometer, infrared spectrometer, and x-ray diffraction unit in detecting the presence of and identifying additives is discussed. (*Chem. Abs.* **47**, 1409)

Production of fatty acid containing products by oxidation of petroleum gatsches. H. Pardun. *Erdol und Kohle* **6**, 10-16 (1953). Technically usable synthetic products having fatty acid contents of about 35% and containing 7-10% of petroleum insoluble hydroxy-acids were obtained by oxidizing petroleum gatsches with air in the presence of manganic hydroxide as the catalyst. A special oxidation process was developed for spindle and neutral oil gatsches which did not oxidize with this catalyst. A 30% portion of the batch was oxidized first with manganese stearate as the catalyst. This oxidate was stirred at 80° C. with the remaining untreated raw material whereupon the inhibitors precipitated as a viscous resin. The supernatant layer then was oxidized readily with manganic hydroxide which was available in much larger quantities than manganese stearate, to give satisfactory products. By saponification of the oxidation products and separating and acidifying the soap solutions it was possible to obtain products containing as much as 60% of fatty acids.

Stabilizers for fat, oil and soap. Widaly. *Seifen-Öle-Fette-Wachse* **79**, 1-4(1953). The article reviews the additives which have been used to delay or prevent the changes in odor that result from the contact of fats, oils and their products with light, air, and humidity.

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Polishing composition. Ralph G. Swanson (to E. I. du Pont de Nemours & Co.). *U. S. 2,614,049.* The composition consists of beeswax 0.9, microcrystalline hydrocarbon wax 1.5, MgO 1.5, polysiloxane 3.0, Al stearate 1.2, and petroleum naphtha b. 140-200° 91.9 parts by weight. The wax polishing composition can be sprayed on relatively smooth surfaces. The film has improved gloss, is easy to polish, and has relatively good durability on outdoor exposure. (*Chem. Abs.* **47**, 1412)

Dewaxing paper. Henry B. Hope (to R. H. Comey Co. Inc.). *U. S. 2,614,922.* Waste wax paper is digested in an aqueous solution containing 0.4-1.9% of an organic sulfonated detergent and sufficient strong acid to provide a pH of 1.3-2.0, at a temperature of 70-100° for fifteen minutes to five hours. This causes the waxy constituents to separate from the paper and rise to the surface of the bath. The wax is skimmed and drawn off the surface; the paper is then immersed in a 2nd bath containing 0.03-0.2% of a gas-evolving bleaching agent in water, such as $NaClO_2$, at about 70° for 10-15 minutes. This further loosens the remaining wax, which is skimmed off, and bleaches the paper. The wax-free paper is rinsed with hot water and dried at about 105°. (*Chem. Abs.* **47**, 1390)

• Detergents

Lenore Petchaft, Abstractor

An X-ray study of potassium laurate solutions. Donald E. Andersen and Gene B. Carpenter (Brown Univ. Providence, R. I.). *J. Am. Chem. Soc.* **75**, 850-6(1953). The small-angle X-ray scattering from concentrated solutions of potassium laurate has been reinvestigated with the use of monochromatic radiation. The measured intensity has been used to calculate the radial distribution function for the potassium gegenions which sheathe the laurate micelles. Ambiguities in the interpretation have been reduced by theoretical arguments and by comparisons of the distributions calculated on the basis of alternative assumptions. For 30% (by weight) solutions, the micelle centers form a loose close-packed arrangement; the arrangement becomes less ordered as the concentration is decreased. Detailed conclusions regarding the structure of the micelles cannot be obtained from the data reported.

Surface active agents. W. L. Barr (N. Z. Forest Products Ltd., Auckland). *J. New Zealand Inst. Chem.* **16**, 121-41(1952). A review, including a table of surface-active agents available in New Zealand, their chemical compositions and uses (*Chem. Abs.* **47**, 1953).

The washability of synthetic fibers. W. Brennecke. *Melliand Textilber.* **33**, 946-50(1952). An outline is given, together with structural formulae, of modern synthetic fibers and their properties including their behavior on washing, for example, changes in strength and elongation, ease of dirt removal, etc. Among the fibers considered are the polyvinyl chloride fibers, nylon, Perlon, Orlon and Terylene.

Soiling and soil retention in textile fibers. Suspending power of surfactants. Jack Compton and W. J. Hart (Institute of Textile Technology, Charlottesville, Va.) *Ind. Eng. Chem.* **45**, 597-602(1953). A theoretical analysis of the mechanisms of soil redeposition during laundering has been made and a technique for the evaluation of the effect of surfactants in such systems is presented. High polymer surfactants are found to have the highest suspending power as a group, both individually and in combination with detergents. This was also found to be the case when the amount of additive was small relative to the detergent. Of the surfactants tested, the anionic cellulose derivatives and polyvinyl alcohol are outstanding. Either synergism or antagonism usually results from combinations of surfactants. Addition of alkaline builders to detergents decreases the suspending power of the detergent but this effect can be overcome by the addition of small amounts of high polymer suspensants which show synergism. A negative temperature coefficient for soil deposition on cotton fiber was found for fatty acid soap alone and in the presence of the additives, sodium cellulose glycolate and sodium cellulose sulfate, whereas a zero or positive temperature coefficient was found for sodium N-methyl-N-oleoyl taurate and an alkylarylsodium sulfate under similar conditions.

A study of soiling and soil retention in textile fibers. Grease-carbon black soil-cotton fiber systems. Jack Compton and W. J. Hart (Institute of Textile Technology, Charlottesville, Va.). *Textile Research J.* **23**, 158-63(1953). A study has been made of the general system grease-carbon black soils-cotton fiber. Sorptive binding of soil to fiber is shown to occur in such systems by a grease layer which bonds the soil particles to the fiber surface. The effect of detergents and solvents on the grease-soil-fiber bond to reduce the tenacity with which soil is held is taken as evidence for this. Soil particles in grease-soil-fiber systems may be attached to the fiber surface by sorption, micro-occlusion, or both. Sorptive bonding of soil particles on a greasy fiber surface does not appear to occur during the primary stage of soil deposition, but only as water is removed from the system.

Primary deposition of grease-free carbon black soil on various types of textile fibers. Jack Compton and W. J. Hart (Institute of Textile Technology, Charlottesville, Va.). *Textile Research J.* **23**, 164-8(1953). For a series of textile fibers, including cotton, silk, wool, linen, rayon, nylon, and Fortisan, soil-fiber complexes with grease-free carbon blacks have been studied. A marked variation of the percentage distribution of total surface occupied by crevices of varying diameter has been shown to exist for different textile fibers. The rate of primary deposition of soil and the suspending power of different surfactants has been shown to vary between the different fibers. Synergism of surfactants appears to be a property characteristic of the entire soil-fiber-surfactant system.

Nonionics—the all-surface cleaners. Manuel N. Fineman (Rohm and Haas Co., Bridesburg, Pa.). *Soap Sanit. Chemicals* **29**, No. 2, 46-9, No. 3, 50-3, 114(1953). A new dynamic detergency test involving agitation of clean and soiled substrates in detergent solutions in a standard Launderometer is described. Metal and glass substrates, soiled with the standard oily-carbon paste, were cleaned with anionic, cationic and nonionic surfactants. The data indicate that although the anionic surfactants generally cleaned glass well, they were ineffective—and in some cases caused oil redeposition—on metals. Similarly the cationics promoted soil redeposition on glass. The nonionics were effective in cleaning both kinds of substrate. The nonionics were also good soil suspending agents.

Role of surface active agents in wetting. Frederick M. Fowkes. (Shell Development Co., Emeryville, Calif.). *J. Phys. Chem.* **57**, 98-103(1953). It has been shown that the rate of wetting of cotton in the Draves-Clarkson sinking test or similar immersion tests is a function of only the contact angle of the solution on wax, and of the extent of adsorption. Equations have been derived that relate these factors so that with only a knowledge of the relation of surface tension to concentration for a given wetting agent one can calculate the sinking times as a function of concentration. Furthermore, since the relation of surface tension to concentration of wetting agents is known to be predictable from molecular structure (by consideration of critical concentrations for micelle formation and areas per adsorbed molecule) these equations can be used to correlate wetting properties of surface active agents with their molecular structure.

The determination of surface active agents. George R. Lewis and L. Kermit Herndon (Ohio State Univ., Columbus). *Sewage and Ind. Wastes* **24**, 1456-65(1952). Two phase dye-transfer titration methods are effective for determining surface-active agents. The methods depend upon the difference in solubility or dye-surface- active agent complexes in water and an organic solvent. Both acid and basic dyes can be used, but acid dyes such as Pontamine Fast Red 8 BNL or Brilliant Blue FCF are preferred. (*Chem. Abs.* **47**, 2516)

Black and colored dirt. The nature of the washing process. Part IIIb. Horst Reumuth. *SVF Fachorg. Textilver.* **7**, 255-68 (1952). The effect and mode of action of water softening agents of the trinitrilo acetic acid (Trilon) and phosphate polymer (Calgon) types have been examined by means of the ciné microfilm technique. The same technique has also been used to investigate mineral crystallization (from hard waters) on the surface of fibers, and the effect on the wearing properties of fabrics and also on the behavior of fabrics so coated, when subjected to later finishing processes. Rayon fabrics in particular are liable to develop "white" areas, that is, areas brighter than the general surface, when calcium, magnesium, or other metallic soap deposits crystallize and cause chafing effects during subsequent operations. The beneficial effects of decalcification are clearly shown.

Part IV. Horst Reumuth. *SVF Fachorg. Textilver.* **7**, 303-13, 411-28 (1952). A review is given, with critical comments, of the development of theories concerning wetting out, air displacement from within fibers and fabrics, swelling of dirt and textile materials, removal of dirt by mechanical working, washing efficiency and electrical charge relationships, grease dispersion (emulsification), formulation of detergent "hydrate" fluid crystals, etc.

New sulfurated anionic detergents. A. Spada and E. Gavioli (Univ. Modena, Italy). *Farm. sci. e. tech.* (Pavia) **7**, 441-7 (1952). Mono- and dibasic acids were transformed into the substituted amides by heating with $H_2NC_2H_4OH$ at 160° for 4 hours in the presence of $ZnCl_2$. The N-hydroxyethylamides of lauric acid melts at 78°, that of oleic at 92°, of stearic at 96°, of palmitic at 94°, of adipic at 79-80°, and of sebacic at 141°. Also prepared were the ethanolamides of the fatty acids from coconut oil and from spermaceti. Treating the amides with HSO_3Cl and forming the Na salts lead to detergents. (*Chem. Abs.* **47**, 894)

PATENTS

Surface-active composition. William A. Fessler (Allied Chemical & Dye Corp.). *U. S. 2,626,244.* A surface-active composition with improved detergent properties is prepared from a combination of a nitrosation-sulfitation product derived from higher olefins of cracked petroleum distillate, with an alkylbenzyl pyridinium salt derived from lower olefins of the same cracked petroleum distillates.

Polypropylene benzene sulfonate detergent compositions containing tetrasodium pyrophosphate. Samuel A. Russell, III (Allied Chemical & Dye Corp.). *U. S. 2,626,900.* The detergent effect of polypropylene benzene sulfonate detergent compositions containing an average of between 13 and 15 carbon atoms is improved by the addition of between 1 and 4 parts of tetrasodium pyrophosphate for each part by weight of the sulfonate.

Surface active alkyl benzene sulfonate composition. Jay C. Harris (Monsanto Chemical Co.). *U. S. 2,630,411.* A mixture of alkylbenzene sulfonates, which form clear water solutions in concentrations up to and including 30% by weight, which remain clear after having been subjected to lower temperatures, may be obtained by mixing 60% to 70% by weight of alkylbenzene sodium sulfonate wherein the alkyl group averages 9 carbon atoms and is derived from a propylene polymer fraction boiling over the range of 118°C. to 142°C. with from 40% to 30% by weight of an alkylbenzene sodium sulfonate wherein the alkyl group averages 12 carbon atoms and is derived from a propylene polymer fraction boiling between 175°C. to 225°C.