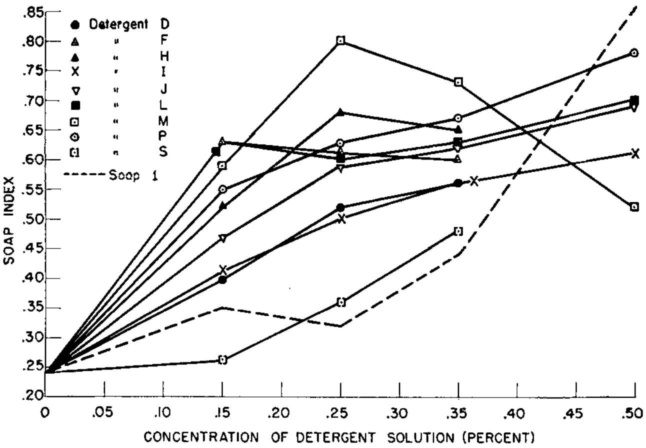

Fig. 2. Soil-removing efficiency of detergents D through S and soap 1 in water of 300 ppm. hardness at 60°C.

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sulfate, were considerably more effective in removing soil than the soap used as the standard.

Summary

A number of N-alkyl-D-gluconamides and a rosin substituted D-gluconamide were prepared in good yield by reacting long chain fatty amines and rosin amine with D-glucono-delta-lactone. Reaction of these compounds with chlorosulfonic acid yielded sulfates of various degrees of substitution whose sodium salts exhibited marked surface active properties. Soil-removal tests with cotton fabric showed several of these products to be effective detergents in hard water.

Acknowledgment

The authors are indebted to C. H. Van Etten and Mrs. Mary Wiele of the Analytical and Physical Chemical Division of this laboratory for the microanalyses.

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ABSTRACTS . . . . Don Whyte, Editor

• Oils and Fats

R. A. Reiners, Abstractor

Use of trichloroacetic acid in the purification of lipids. R. M. Johnson and P. R. Dutch (Detroit Inst. Cancer Res., Detroit, Mich.). *Proc. Soc. Expt. Biol. Med.* **78,** 662(1951). Purified lipids may be extracted from tissue with ethanol-ether solution if the tissue is first extracted with 10% trichloroacetic acid solution made 0.4M with $MgCl_2$.

Inert gas: safeguard of quality. T. W. Eselgroth (Linde Air Products Co.). *Food Eng.* **23**(12), 72(1951). The use of nitrogen packing to prolong shelf life of oils and oil containing products is discussed.

Spectrophotometric studies of the composition of the seed oils of plants of the Maydeae tribe. R. H. Wiley and P. H. Wilken (Univ. Louisville, Louisville, Kentucky). *J. Org. Chem.* **16,** 1536(1951). Previous undescribed seed oils of three genera of the *Maydeae* tribe of the *Gramineae* family—*Coix lacryma* (Job's Tears), *Tripsacum* and *Euchlaena mexicana* (teosinti)—have been isolated. The saponification values range from 151-175, the iodine values from 95-133, the refractive index values from 1.467-1.472 and the density from 0.917-0.919. The oil yield was from 8-10% of the kernels. The *Coix* oil is most saturated with an iodine value of 94.8 and differs most clearly from the others. The oils consist of 22.8-50.4% of diene structure, 46.4-59.6% of monoene structure and 3.2-17.6% of saturated structure.

Fatty amine products of high molecular weight. Quantitative titration in acetic acid. D. E. Terry, K. R. Eilar and O. A. Moe (General Mills, Inc., Minneapolis, Minn.). Anal. Chem. 24, 313(1952). Fatty amine acetates, fatty secondary and tertiary amines and fatty aminonitriles can be quantitatively determined by titration in a warm glacial acetic acid solution with perchloric acid using crystal violet as an indicator.

New churned margarine is a texture triumph. L. E. Slater. *Food Eng.* **24,** 111(1952). An improved process of margarine manufacture is described.

Quality of continuously distilled fatty acids exceeds that of batch-still products. Anon. *Chem. Proc.* 15(2), 9(1952). A brief description of results obtained by continuous distillation of fatty acids.

Niger seed from Tanganyika. R. W. Pearman, W. D. Raymond and Miss J. A. Squires. *Colonial Plant Animal Prod.* 2, 101 (1951). Niger seeds contain about 30% oil which has the following characteristics: $d^{15.5}$ 0.9249, n^{20} 1.4752, acid value 1.4, iodine value (Wijs) 140, unsaponifiable matter 1.1%, Lovibond color (1 in) 16 Y, 1.1 R. The fatty acids contained 71% linoleic, 14% oleic and 15% saturated acids. The oil cake is not suitable for feeding purposes.

Detection of extraneous fats in butter. A. Neri (Lab. "Nefer," Milan). *Latte* 25, 196, 214(1951). First class tallow moderately added to butter can change the Wollny and Polenske nos. within the legal (Italian) limits. The stearin must be identified directly to uncover the adulteration. (*Chem. Abs.* **46**, 2201)

Highly unsaturated fatty acids. XIV. Highly unsaturated fatty acids of herring oil. T. Tsuchiya and A. Kato (Govt. Chem. Ind. Research Inst., Tokyo). *Repts. Govt. Chem. Ind. Research Inst. Tokyo* **45**, 191-4(1950). The herring oil from Hokkaido was saponified, and freed of the unsaponifiable matter by extracting with ether and acidified to separate the fatty acids (n^{20} 1.4857, iodine no. 310, and neutralization no. 184; yield 5.17%) which were converted to their methylates and fractionated at 5 mm. The main unsaturated fatty acids were $C_{22}H_{32}O_2$, $C_{20}H_{32}0_2$, and $C_{20}H_{30}O_2$, and the minor components were nisinic ($C_{24}H_{36}O_2$), probbaly scoliodonic ($C_{24}H_{38}O_2$), and moroctic ($C_{18}H_{28}O_2$) acids. Besides these, hiragonic acid ($C_{16}H_{26}O_2$) and another still more highly unsaturated acid ($C_{16}H_{24}O_2$) seemed to be present. (*Chem. Abs.* **46**, 2317)

Methods of molecular spectral analysis applied to the investigation of fats. M. G. Batishcheva, L. A. Grauerman, L. G. Karatsevich, A. N. Mironova and K. S. Popov (Leningrad Univ.). *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* **14**, 458-65 (1950). Polyunsaturated fat acids with conjugated double bonds have absorption bands at 234, 268, and 316 mμ for 2, 3, and 4 double bonds, respectively. Infrared spectra of lauric, stearic, and oleic acids, methyl linoleate, trilaurin, and glycerol in 0.5 and 1% solution in CCl_4 have been measured with a LiF prism spectrograph. In all these substances appear the $\lambda = 3.5$ and $\lambda = 3.4$ CH_2 and CH_3 bands. The band at 3.33 μ corresponds to the :CH group, and this band can be used for analysis. Spectra of cottonseed oil, not hydrogenated and hydrogenated, sunflower oil, and also oxidized and polymerized oils are shown as examples. (*Chem. Abs.* **46**, 2315)

Chemical examination of the fixed oil from the seeds of Abutilon indicum. B. K. Gupta and G. S. Saharia (Univ. Delhi, India). *J. Univ. Bombay* 19, Sect. A, Pt. 3, Sci. No. 28, 29-33 (1950). The oil is present in the seeds to the extent of approximately 5%; the unsaponifiable matter (1.77%) is sitosterol; d^{25}, 0.9217; n^{32}, 1.4670; viscosity at 25°, 52.66 centipoises; saponification no., 181; acetyl no., 14.8; acid no., 16; iodine no., 144 (Wijs); Hehner no., 94. (*Chem. Abs.* **46**, 2318)

Oils and fats in Japan. IV. Sawafutagi-fruit, kikarasu-uri-seed, and hinoki-seed oils. T. Tsuchiya and S. Kinomura (Govt. Chem. Ind. Research Inst., Tokyo). *Repts. Govt. Chem. Ind. Research Inst. Tokyo* **45**, 231-4(1950). From the fruit of sawafutagi (*Symplocoo cragaegides*) was extracted with ether a non-drying oil (d^{15} 0.9266, n^{20} 1.4705, acid no. 4.35, saponification no. 190.3, iodine no. 96.9, and unsaponifiable matter 1.2%). The fatty acids separated from the oil were mainly liquid (80%) composed of oleic and linoleic acids, stearic and palmitic acids forming the solid part. In the unsaponifiable matter were aliphatic unsaturated alcohols, sterols, and hydrocarbons. From the kernel of kikarasu-uri (*Trichosanthes japonica*) seed was extracted with ether a drying liquid oil (d^{15} 0.9383, n^{15} 1.5011, acid no. 2.16, saponification no. 189, iodine no. 158, and unsaponifiable matter 3.20%) closely resembling tung oil. The main fatty acid was a stereoisomer of eleostearic acid (probably tricosanoic acid). From the seed of hinoki (*Chmaecyparis obtusa*) was extracted with ether a dark green oil (d^{50} 0.9977, n^{15} 1.4988, acid no. 10.7, iodine no. 194, saponification no. undetermined because of the dark color of the liquid, and unsaponifiable matter 32.15%). The fatty acids were mainly liquid (92%) composed of oleic and linoleic acids, stearic and palmitic acids forming the solid part. (*Chem. Abs.* **46**, 2317)

Rice-bran oil. I. The pigments. T. Tsuchiya and R. Kaneko (Govt. Chem. Ind. Research Inst., Tokyo). *Repts. Govt. Chem. Ind. Research Inst. Tokyo* **45**, 252-60(1950). The oil extracted from rice bran with acetone and then with ether and neutralized with Na_2CO_3 was separated into the methanol-insoluble and -soluble parts with twice its weight of methanol. The insoluble part contained chlorophyll-a (-b in a minute amount if present at all) and a carotenoid not containing OH groups. The soluble part dissolved in petroleum ether-C_6H_6 was separated chromatographically into orange-yellow, deep yellow, greenish brown, and colorless zones whose absorption bands indicated the presence of some oxidation decomposition products and a carotenoid containing OH groups.

II. The fatty acids. Ibid. 307-10. The oil (acid no. 91, saponification no. 182, iodine no. 104, and unsaponifiable matter 6.11%) was saponified with alcoholic KOH solution. The main saturated fatty acids were palmitic, stearic, tetracosanoic, and hexacosanoic acids; the unsaturated acids were oleic and linoleic (linolenic acid was found in another sample). (*Chem. Abs.* **46**, 2319)

Human skin lipids with particular reference to the self sterilizing power of the skin. C. R. Ricketts, J. R. Squire and Elizabeth Topley (Birmingham Accident Hosp., Engl.). *Clin. Sci.* **10**, 89-111(1951). The lipid fraction of acetone extracts of human forearm skin has the following composition: m.p. 40°, solidification point 35°, acid no. 68, iodine no. 53, saponification no. 110, free sterol (as cholesterol) 3.75%, total sterol (as cholesterol) 6.75%, neutral lipids 60%, free saturated acids 20%, free unsaturated acids 20%. The Ba salt of the unsaturated acids fraction was shown by x-ray photography to be largely oleic acid. Data is given on the disappearance of various types of gram-positive and gram-negative bacteria when implanted on skin under a variety of conditions. (*Chem. Abs.* **46**, 1636)

Lipids of the nervous system of the squid Loligo pealii. J. D. McColl and R. J. Rossiter (Univ. Western Ontario, London, Can.). *J. Exptl. Biol.* 28, 116-24(1951). The concentration of total phospholipin, free and total cholesterol, cerebroside (glycosphingoside), monoaminophospholipin (phosphoglyceride), and lecithin (phosphatidyl choline) was determined in the central ganglia, pallial nerve, whole giant fiber of the stellar nerve, and axoplasm of the giant fiber. The concentration of total phospholipin in the central ganglia was of the same order as that found in the mammalian brain, but the concentration of cholesterol and sphingomyelin was less. The results suggest that the axon of the giant fiber of the stellar nerve is surrounded by a thick lipid-containing sheath. Neither cerebroside nor esterified cholesterol was found in the nervous system of the squid. (*Chem. Abs.* **46**, 1659)

Analysis of saturated and unsaturated fatty acids. H. Anders. *Deut. Farben-Z.* 5, 384-7(1951). The separation of palmitic-stearic acid mixtures by fractional precipitation of the Mg salts, the fractional vacuum distillation of the methyl or ethyl esters of fatty acids, the fractional precipitation of the Pb or K salts of mixtures of saturated and unsaturated fatty acids, the distillation of brominated esters, and the fractionation of hydroxy acids (obtained by oxidizing fatty soaps with $KMnO_4$) are reviewed. (*Chem. Abs.* **46**, 1392)

Oxidation of saturated fatty acids. III. Oxidation of capric, myristic, and palmitic acids. H. Nobori and M. Noguchi. *J. Soc. Chem. Ind. Japan* **46**, Suppl. binding 146-7(1943). The oxidation was carried out as follows: capric, myristic, and palmitic acids (50 g., respectively) were treated with 0.05 g. of $KMnO_4$ at 110° for 20 hrs. while being agitated with air at a rate of 2 l./min. The procedure of the oxidation was compared with the oxidations of lauric and stearic acids. The results are summarized as follows: capric acid changes its acid no. and saponification no. very little, even after 20 hrs. of oxidation; it is very stable to oxidation. The fatty acids separated from the oxidation products of capric, myristic, and lauric acids had no esterification nos. and did not include hydroxy acids. The fatty acids obtained from the oxidation of palmitic and stearic acids had no esterification or hydroxyl nos. From results of fractional crystallization, from aqueous alcohol, the authors concluded that the content of lactones and hydroxy acids is greater with the longer C-chain fatty acids. Fatty acids are less stable to oxidation as the C chain increases. (*Chem. Abs.* **46**, 1781)

Oxidation of saturated fatty acids. IV. Oxidation of coconut-oil fatty acids. H. Nobori (Kao Soaps Co., Tokyo). *J. Soc. Chem. Ind. Japan* **46**, Suppl. binding 189(1943). During oxidation with $KMnO_4$ at 130°, the acids lower than caprylic acid distilled off, capric acid was stable, lauric and myristic acids were only slightly oxidized, and acids higher than palmitic acid were considerably oxidized.

V. Oxidation of lauric and stearic acids at high temperature. *Ibid.* 189. During oxidation with $KMnO_4$ at 180°, the acid no. decreased, and the saponification no. and the ester no. increased. The oxidation product of lauric acid contained a certain amount of hydroxy acid, while that of stearic acid contained very little.

VI. Oxidation of a mixture of stearic and lauric acids. *Ibid.* 220. At 150° or at 110° the oxidation of the mixture is accomplished much more rapidly than the oxidation of either acid alone.

VII. Absorption separation of the oxidation products of stearic acid. *Ibid.* 248. The fatty acids obtained were separated by absorption on Al_2O_3 with C_6H_6 as a solvent. (*Chem. Abs.* **46**, 1781)

Reaction kinetics of branched -chain fat acids. II. Identification of branched-chain fat acids by means of the esterification reaction. K. E. Schulte and J. Kirschner (Deut. Forschungsanst. Lebensmittelchemie, Munich, Ger.). *Fette u. Seifen* **53**, 456-7(1951). The presence of side chains on the α or β carbon of a fat acid and the approximate length of that side chain can be predicted from the rate of reaction with methanol. (*Chem. Abs.* **46**, 1781)

Autoxidation of fatty materials and their antioxidants. I. H. Nogami, N. Matsuda and K. Nagasawa (Univ. Tokyo). *J. Pharm. Soc. Japan* **71**, 813-17(1951). Progress of autoxidation and change in peroxide indexes and iodine nos. on lard, camellia oil, and methyl oleate were observed. Influence of ultraviolet irradiation on autoxidation was determined. Oxidizabillity of synthetic triolein was inhibited by the unsaponifiable matter of camellia oil.

II. Polarograms of autoxidized methyl oleate, triolein, and lard. *Ibid.* 818-21. Methyl oleate, synthetic triolein, and lard were oxidized and the properties of their oxidation products and their oxidation mechanism were followed by polarography. There was one reduction wave due to the double bond in oleic acid in all 3, besides 2 distinct waves and a maximum wave. From the chemical analyses of peroxides and polarographic analyses, the 2 waves and the maximum wave were found to be due to unstable peroxides that form at the initial stage of autoxidation of the oil and turn into stable peroxides which can be determined by chemical methods, but not by polarography. (*Chem. Abs.* **46**, 1781)

Newer American developments in the field of fats and oils. A. R. Baldwin (Corn Products Refining Labs., Argo, Ill.). *Fette u. Seifen* **53**, 509-16(1951). A review with 48 references. (*Chem. Abs.* **46**, 1782)

Variation in fat and glycogen content of the bot fly (Grastrophilus intestinalis) larva tracheal organ during development. L. Levenbook (Univ. Cambridge, Engl.). *J. Exptl. Biol.* **28**, 173-80(1951). The glycogen content of the tracheal cells, low during the 2nd and early 3rd instars, gradually increases to a maximum of over 40% of the tissue dry weight during the middle of the 3rd instar, and then progressively declines. Fat is accumulated in the tracheal cells throughout development and attains a maximum of over 35% of the tissue dry weight about the 7th to the 10th day of pupation. At the beginning of the 3rd instar phospholipid accounts for almost the whole of the total fat; at the end of the instar it forms less than 10% of the total fat. In the tracheal organ of fasting larva glycogen is probably converted into fat. (*Chem. Abs.* **46**, 1660)

Fatty acids from the seed oil of Nandina domestica. T. Ohta and T. Miyazaki (Tokyo Coll. Pharmacy). *J. Pharm. Soc. Japan* **71**, 769-71(1951). The seeds give 8.7-9.4% oil. Fatty acids consist of 32.3% saturated (palmitic and stearic) acids and 67.7% unsaturated (mostly linoleic and less oleic) acids. The unsaponifiable portion gives 1.7% phytosterol. (*Chem. Abs.* **46**, 1782)

Utilization of crude chrysalis oil. I. Preparation of cutting oil and detergent oil from chrysalis-oil foots. Y. Sumiki and K. Kawasumi. *J. Agr. Chem. Soc. Japan* **22**, 9-10(1948). The chrysalis-oil foots, obtained on alkali refining of the crude chrysalis oil, contained water 24, crude fat 42%, acid no. 13, saponification no. 38, and iodine no. 82, was sulfonated with concentrated H_2SO_4 to a product with combined SO_3 0.3-0.6%. Sulfonated chrysalis-oil foots is a good detergent. When used as a cutting oil, $MgCl_2$ and water glass are added.

II. Preparation of lubricating oil. 1. **Air-blown oil.** *Ibid.* 10. Air was blown at the rate of 60 l. per minute for 3 hrs. into crude oil (saponification no. 196, iodine no. 123) at 70-170° (with 10° intervals), and the products were analyzed. With increased blowing temperature the density increased to 1.0210 at 160° (170° air-blown product is resinous); *n* and saponification no. rose slightly; viscosity increased remarkably; f.p. was above —4°; flash point was 244° (maximum) with the 80° treatment; the treated oil lost the peculiar odor of the raw crude oil.

III. Preparation of lubricating oil. 2. **Interesterification.** Y. Sumiki, Y. Kishibe and M. Furuya. *Ibid.* 39-42. Alcoholysis of crude chrysalis oil with ethanol and methanol gave an esterified oil suitable as a lubricating oil. Alcoholysis should be with a 2:1 ratio of oil: ethanol (95%), 3-6% H_2SO_4 (66° Bé) catalyst, 5-6 hrs., and at 85-95°, and product should be washed 4-5 times with half portions of water at 50-70°. In the case of crude oil with a high acid no. (109), the free fatty acids were easily esterified, but the glyceride portion was not much esterified for the glycerol content of the waste liquor was low. (*Chem. Abs.* **46**, 1782)

Whole rapeseed oil. Delobez and Mestreit. *Bull. mens. ITERG* **5**, 468-9(1951). Raw rapeseed oil treated according to the recommendations of Kaufmann by deodorization in the laboratory for 5 hrs. had a peroxide no. as high as 66.5. An accelerated flavor reversion test was executed by heating the oil in a closed tube filled with N for 4 hrs. at 140°. Flavor, expressed in conventional units, deteriorated from an original value of 7 to 3. The same oil bleached previously with fuller's earth (2%) showed peroxide no. 50, reversion from 9 to 6 units. Another sample refined in the factory and deodorized for 2 hrs. in the laboratory had a peroxide no. of only 9 with nearly the same reversion values: 10 and 6. (*Chem. Abs.* **46**, 1782)

Application of a new method for the determination of the iodine number in oils rich in ethylenic conjugated bonds. Mme. S. Dupin (Lab. Chevruel, Paris). *Bull. mens. ITERG* **5**, 469-71 (1951). By employing the new method of Benham and Klee the following values were found after 1, 2, and 3 hrs., respectively (Hanus values in parenthesis): oiticica oil (178.7), 172.9, 182.1, and 181.7; isano oil (153.3), 221.3, 237.4, 236; castor oil (84.9), 83, 85.3, 85; Cihna wood oil (168), 205.2, 233.2, 234; stand oil of linseed oil (124.2), 118.7, 127.1, 126.7; and linseed oil (169.9), 165, 169.3, 168. The weight of the sample should not be greater than 0.05 g./50 ml. of mixture. The method is costly and disagreeable because of the toxic reagents. (*Chem. Abs.* **46**, 1783)

Investigation of a fraction of acids of the phthioic type from the tubercle bacillus. J. Cason and G. Sumrell (Univ. California, Berkeley). *J. Biol. Chem.* **192**, 405(1951). At least 12 components ranging in molecular weight from C_{23} to C_{31} were found in crude phthioic acid. One acid was isolated in pure condition, a C_{27} acid which is apparently a 2-alkyl-2-alkenoic acid with a second substituent in the 4 or 5 position and a third substituent on a carbon more remote from the carboxyl. Physical data indicate that the mixture contains other acids of similar structure but of different molecular weight.

The principal structural features of C_{27}-phthienoic acid. J. Cason, N. K. Freeman and G. Sumrell. *Ibid.* 415. The structure of C_{27}-phthienoic acid is indicated to be $C_4H_9(CH_2)_{15}—\overset{CH_3}{CH}(CH_3)—CH_2—CH=C(CH_3)—CO_2H$. C_{29} phthianoic acid apparently has the same structure except that the principal chain is 2 carbon atoms longer.

Improved varieties of oilseeds—castor. T. S. Krishnamurity. *The Oils and Oilseeds Journal* **4**, No. 7, 8-10(1952). Discusses uses and yields of various varieties of castor oilseeds in India.

Experiments on the use of electrolytes in crushing olives and some remarks on oleotechnical practices. P. G. Garoglio. *Olearia* **5**, 341-352(1951). Electrolytes such as sodium chloride are used in the preparation of olive mush to correct the rancidity and acidity of olive oils. The addition of 1.5-3.5% NaCl when crushing ripe olives improves the oil yield.

Method for rapid determination of iodine number. C. R. Mayerhopper. *Olearia* **5**, 353-357(1951). The methods for determining iodine no. were surveyed. The modified Scotti method was found to be the most reliable rapid method. The method uses a 2.5% solution of mercurial acetate in glacial acetic acid added to the Wijs solution and is complete in three minutes.

PATENTS

Refuse palm oil refining. V. K. Babayan. *U. S. 2,587,954.* Refuse palm oil is refined by treating it with 1-5% of a mineral acid in the presence of water in amount at least equal to 50% of the weight of oil at a temperature between 0° to 100°.

Solvent extraction combination. R. T. Anderson (V. D. Anderson Co.). *U. S. 2,588,070.*

Process of treating fatty material. C. van Loon, E. Smit and W. van Rijn van Alkemade (Lever Brothers Co.). *U. S. 2,588,435.* A method is claimed which comprises reacting fatty glyceride stocks containing free fatty acids with a high boiling alcohol in the presence of an esterification catalyst and at a temperature above the boiling point of water at the reaction pressure, and the alcohol having a boiling point above the reaction temperature whereby water is removed during the reaction without too great a part of the high boiling alcohol evaporating. Free fatty acids in the stock are substantially completely esterified, and the reaction mixture is reacted with a low molecular weight monohydric alcohol to form low molecular weight monohydric alcohol esters of fatty acids.

Peroxide treatment of fatty oils. L. P. Wiebe (Shell Development Co.). *U. S. 2,588,902.* A process is disclosed for improving the drying properties of fatty oil having an iodine value of at least 120 which comprises heating the oil at about 100°-250° in the presence of a peroxide compound containing a tertiary-alkyl peroxy radical.

Retardation of development of reversion flavor in hydrogenated fats and oils. W. Lange and R. G. Folzenlogen (The Procter and Gamble Co.). *U. S. 2,589,097.* A process of retarding the development of reversion flavor in a revertible alkali refined, filtered, and hydrogenated fatty glyceride oil which before hydrogenation contains combined fatty acids with more than two double bonds in non-conjugated position is disclosed, which comprises contacting the alkali refined and filtered liquid oil prior to hydrogenation and in the substantial absence of oxygen with at least one solid material in particulate form and of the group consisting of activated alumina, active aluminum silicate, calcium hydroxide, calcium oxide, and zinc oxide, separating the solid material from the treated oil, and hydrogenating the treated and separated oil before the oil has substantial contact with oxygen.

Process of separating fatty acids. E. Schlenker. *U. S. 2,589,148.* Process of separating a mixture of fatty acids into fractions of different solubilities is claimed which comprises mechanically stirring and slowly cooling the mixture to a temperature of about 15°-20° below the titre of the mixed fatty acids whereby a pasty crystalline mass of high viscosity is formed and mixing the pasty mass with a solvent which possesses at the employed temperatures selective solvent power for unsaturated constituents and separating the solid phase from the liquid phase.

Method of preparing stabilized tall oil nitriles. J. Drew and J. C. Funderburk (Hercules Powder Co.). *U. S. 2,589,233.* Tall oil nitriles are formed by heating tall oil in liquid phase with gaseous ammonia in the presence of a group II metal salt of tall oil carboxylic acids.

Method of preparing fatty acid nitriles. J. Drew and J. C. Funderburk (Hercules Powder Co.). *U. S. 2,589,232.* The process of preparing an aliphatic nitrile is claimed which comprises reacting fatty acids having 12-18 carbon atoms in liquid phase with gaseous ammonia in the presence of the calcium or zinc fatty acid salt.

Removing oil from vegetable materials. A. E. Eriksen. *U. S. 2,589,238.* Comminuted oil bearing vegetable material containing insoluble mineral compounds is mixed with a cation exchange resin containing hydrogen ions to change the insoluble substances to soluble organic compounds. These are dissolved in water thus weakening the cells of the vegetable matter. The cation exchange resin is removed and the oil is extracted from the resulting mixture.

Production of fatty alcohols. E. C. Kunz and A. T. Fiore (The Givaudan Corp). *U. S. 2,590,105.* The process for preparing saturated aliphatic alcohols containing 11 to 18 carbon atoms in the molecule is disclosed which comprises reacting an aliphatic carboxylic acid having 11 to 18 carbon atoms, a copper salt of such acid and hydrogen, under elevated temperature and pressure, the acid being present at the start of the reaction in larger amount than the salt.

Re-esterification of fats and oils. S. Iwasaki, *et al.* (Nissan Chemical Industries Co.). *Japanese 173,087.* To 100 parts of fats or oils is added 105 parts ethanol, the mixture is heated at 300° under 75 atmosphere for 2 hrs., an excess of ethanol is recovered by distillation, and glycerine is separated from the lower layer by washing with water several times. The yield of ester is 95-6%. (*Chem. Abs.* **46**, 2319)

Catalyst for hydrogenation of fats, fat acids, and oils. Y. Endo and Y. Kawakami (Nippon Volatile Oil Co.). *Japanese 181,347.* Aqueous Ni salt and kieselguhr are treated with Na_2CO_3 at 60° to precipitate the basic Ni carbonate; this is molded and heated to convert it into an oxide at 400°. The air is replaced by N, H is passed in at 400°, the temperature is lowered to 150°, H is replaced with N or CO_2 and then with air to oxidize it to Ni_2O_4. Examples of hydrogenation of fats and oils are given. The catalyst is stable in air. (*Chem. Abs.* **46**, 2319)

• Biology and Nutrition

R. A. Reiners, Abstractor

Preliminary note on the nutritional value of pumpkin seeds (from Puerto Rico). C. F. Asenjo and J. A. Goyco (Univ. Puerto Rico, San Juan, Puerto Rico). *Bol. colegio quim. Puerto Rico* **8**, 14-16(1951). Ether extraction of Puerto Rican pumpkin seeds gave 35.90% dark green oil. Its constants after decolorization were: d^{25} 0.9179; n^{20} 1.4730; iodine no. (Hanus) 114; saponification no. 191; acetyl no. 10; nonsaponifiable 0.556%; saturated fatty acids 20.8%; unsaturated fatty acids 74.6%; iodine no. (Hanus) of the unsaturated fatty acids 149. The digestibility of the oil was for white rats more than 99%. The extracted seeds contained 47-53% crude protein. The addition of a mixture of 75% extracted seeds and 25% *Torula* yeast to a basic diet gave better growth than the addition of extracted seeds or *Torula* yeast alone, but the protein efficiency was increased only slightly. Methionine did not improve the effect of extracted seeds. (*Chem. Abs.* **46**, 1630)

Fatty acid metabolism. I. Cleavage of the carbon chain of 2-phenylstearic acid. 1. O. Tamemasa (Univ. Tokyo). *J. Pharm. Soc. Japan* **71**, 1015-18(1951). Two g. 2-phenylstearic acid in 5 times its weight of soybean oil was injected into rabbits daily for 7 days; urine analysis showed the presence of benzoic acid and α-phenyladipic acid. The latter was assumed to have been formed from 2-phenylstearic acid by 1 ω-oxidation and 6 β-oxidations.

II. 2. *Ibid.* 1019-24. After injection of 123 g. ethyl 2-phenylstearate (94-98% pure) into 3 rabbits in 40-45 days, the urine was tested. α-Phenyladipic acid and a small amount of α-phenylglutaric acid were found. The formation of the latter must have been due to the dehydrogenation at C_9-C_{10}, followed by oxidative cleavage that would yield α-phenylazelaic acid which has then undergone 2 β-oxidations. Significance of such a metabolism is also discussed. (*Chem. Abs.* **46**, 2149)

The role of colamine in the peroxidase oxidation of fatty acids. G. V. Kamalyan (Vet. Inst., Erivan, Armenia). *Biokhimiya* **16**, 396-8(1951). Colamine retards the oxidation of carotenoids and oleic acid by lipoxidase, as well as the autoxidation of lipoxidase. Apparently the colamine combines with the lipoxidase and thereby prevents the formation of the intermediate active peroxide compound. (*Chem. Abs.* **46**, 2103)

Vitamins and the absorption of fats. A. C. Frazer (Univ. Birmingham, Engl.). *Bull. soc. chim. biol.* **33**, 968-72(1951). None of the known vitamins, except choline, appears to have any direct influence on the process of absorption of fats in the intestine. (*Chem. Abs.* **46**, 2138)

A brown discoloration of pig fat and vitamin E deficiency. K. L. Robinson and W. E. Coey (Queen's Univ., Belfast). *Nature* **168**, 997(1951). Pigs on a vitamin E deficient diet rich in highly unsaturated fatty acids made satisfactory growth but the back fats were a yellow-brown in color. Pigs fed the same diet but supplemented with 50 mg. *dl*-α-tocopherol per day did not develop this off colored fat.

Thermal conductivity of human fat and muscle. H. S. Hatfield and L. G. C. Pugh (Med. Res. Council Labs., Molly Hill, London). *Nature* **168**, 918(1951). The thermal conductivity of human fat was found to be about 0.00049 cal. cm./cm^2 sec. °C. The conductivity of muscle was roughly twice that of fat.

• Drying Oils

Stuart A. Harrison, Abstractor

Source, production and application of dehydrated castor oil in the protective coatings industry. T. C. Patton. *Official Digest Federation Paint and Varnish Production Clubs* **No. 326**, 177 (1952). About one billion pounds of castor seed are produced annually in the world. The seed is approximately 50% oil. The two largest producing countries are Brazil and India, whose combined production is about 70% of the total world production. At present the U.S.A. produces about 2% of the total. About one-fourth of the world production is consumed by United States industry, and of this about 30,000,000 pounds are converted to dehydrated castor oil. Formulations and properties of oleoresinous varnishes, paints, and enamels containing dehydrated castor oil are given.

Sunflower seed oil: the influence of temperature on the composition of the fatty acids. D. N. Grindley. *J. Sci. Food Agric.* **3**, No. 2, 82(1952). Other workers have shown that the controlling factor in oil composition of seeds is environment rather than botanical variety. To examine this further, the same variety of seed was sown at two different times of the year in Khartourn, Africa. One crop was harvested in the colder winter season and the other in the hotter summer season. The average iodine value of the winter crop was 124 while that of the summer crop was 106. This definitely shows the effect of temperature on composition of seed oil. Where greater differences in temperature exist, greater differences in composition of oils could be expected.

Examination of varnish making vegetable oils.—1. H. W. Chatfield. *Paint Manuf.* 22, No. 3, 90(1952). The following properties are desirable in oil used for varnish making: rapid dry, pale color, good clarity, unlimited compatibility with white spirits, absence of residual tack on drying, good water resistance, adhesion, and gloss. The methods of testing for these are described and the limits within which oils should fall are given.

Mildew on paints—a major problem. M. Goll, H. D. Snyder, and H. A. Birnbaum. *Am. Paint J.* 36, No. 28, 66(1952). More than 600 discolored paints from various geographical areas were studied for cause of discoloration. Results showed that in 68% of them mildew was the major cause of the discoloration and was a contributing factor in many of the other 32%. One of the instruments used for study was a stereoscopic microscope which made it easier to differentiate between mildew and dirt. It was concluded that mildew was a cause of discoloration in the north as well as in the south. A need exists for an efficient fungicide in exterior paints.

Fundamentals of film formation. H. F. Payne. *Official Digest Federation Paint and Varnish Production Clubs.* **No. 325**, 81 (1952). There are four stages in the life cycle of a paint (1) mix, grind, test, and package a pigment plus vehicle, (2) apply a fluid dispersion of pigment in vehicle which forms a film, (3) as a film of pigment and binder in a solid dispersion, the coating ages, and (4) the pigment and binder deteriorate. The three fundamental factors which determine the type of film formation are (1) chemical composition, (2) functionality of film former, and (3) type and degree of polymerization. These three factors are discussed and amplified with examples taken from commercial preparations.

Drying oils for the paint industry. L. A. Jordan. *Chemistry and Industry* **No. 5**, 92(1952). Reviews the world situation in drying and semidrying oils, particularly as it affects the British paint industry.

PATENTS

Emulsion copolymerization of styrene with bodied oil or bodied oil modified alkyd. R. S. Robinson, *U. S. 2,586,092.* Styrene is copolymerized in emulsion with oils, alkyds, etc. to give products suitable for making emulsion paints, e.g., 77 g. of casein are dispersed in 740 g. of water containing 20 g. of a sodium alkyl sulfate. After stirring to bring about dispersion, 50 g. of ammonium hydroxide sp. g. = 9 are added and the mixture heated to 60°C. After the casein dissolved 4 g. of ammonium persulfate are added, followed by 500 g. of dehydrated castor oil of 15-20 poise viscosity at 250, 20 g. of gum rosin and 250 g. of styrene. The mixture is kept at 60°C. and stirred for 30 hours. A water paint is made from 200 g. of the product by adding 50 g. titiniumdioxide, 60 g. of water and cobalt, lead manganese driers. Films brushed out from this paint became "touch-dry" in one hour.

Manufacture of interpolymers of styrene with polyhydric alcoholic mixed esters and of coating compositions obtained therefrom. D. H. Hewitt and F. Armitage. *U. S. 2,586,652.* More compatible styrenated products are obtained when the polymeric mixture contains conjugated triene fatty acid esters, e.g., 120 parts of a 2:1 mixture of raw oiticica and linseed oils preheated to give a viscosity of 22 poises, 80 parts styrene, 130 parts xylene and 10 parts commercial dipentene are refluxed for 28 hours to a Ford No. 4 cup viscosity of 54 secs. at 25°C. at a solids content of 50%. After adding a cobalt-lead drier the clear solution spreads to clear, non-frosting films which dried in two hours. Tung oil may also be used at concentrations of 5 to 50% of the total fatty esters.

Wrinkle varnishes. *French 960,876.* Wrinkle oils are obtained by heating a glycol with a nonconjugated double bond oil at 175-185° to give a homogeneous mixture which is then heated with a polycarboxylic acid at 255-275°. Propylene glycol (7.15) is heated with cottonseed oil (36.75) at 175-185° until the mixture is homogeneous, fumaric acid 7.25 is then added, and the temperature raised to 260-266° for 30 minutes to give a Gardner-Holdt viscosity of J. The product (45) is mixed with congo gum (22.5) and heated to 304-310° for 30 minutes, cobalt acetate (.0225) is added and the mixture cooled to 205° when petroleum naphtha (54) is added; a film of the product has a fine wrinkle finish. (*Chem. Abs.* **46** 2315)

• Waxes

E. H. McMullen, Abstractor

Composition of fatty acids from oxidized paraffin. A. E. Drabkin and Z. V. Soloveichik (Lensovet Technol. Inst., Leningrad). *Zhur. Priklad. Khim. (J. Applied Chem.)* **24**, 502-8(1951). Chemical investigation of the acids in oxidized Grozny paraffin (acid no. 86.5) showed the presence of the normal monocarboxylic acids Me(CH$_2$)$_n$CO$_2$H, in which n = 5,6,8,10,12,15,16,17,19, and 21. (*Chem. Abs.* **46**, 1966)

PATENT

Process for recovering wax from sugar cane. Victor Merz. *U. S. 2,577,587.* High-melting wax and fatty substances are recovered separately from preferably air-dry sugar-cane residues commonly known as muds or cachaza. The muds are extracted with a selective organic solvent, such as a paraffin hydrocarbon containing at most 10 C atoms in the molecule, an halogenated hydrocarbon, commercial hexane or heptane, or a petroleum spirit having a boiling point between 90-105°. Air-dry sugar-cane filter mud 100 g. is treated with 250 cc. of trichloroethylene (I) at 19° to dissolve the fatty substances; and subsequent evaporation of I yields 2 g. of soft fatty matter. Subsequent extraction of the mud near the boiling point of I yields 13.9 g. of wax, melting at 75°. (*Chem. Abs.* **46**, 2324)

• Detergents

Lenore Petchaft, Abstractor

Surface active agents. C. Gardner (Advance Solvents & Chemical Corp., New York). *Paint, Oil & Chem. Rev.* **115**, No. 7, 14, 16-17(1952). Review of the uses of surface active agents, especially non-ionic and cationic compounds, in the paint industry as emulsifying and dispersing agents for paints.

Metallic soaps. J. P. Wolff. *Bull. mens. ITERG* **5**, 302-5 (1951). A review on the preparation, properties, and applications of metallic soaps. 72 references. (*Chem. Abs.* **46**, 1783)

Synthetic detergent production. L. Flett (National Aniline Division, Allied Chemical & Dye Corp., New York). *Soap Sanit. Chemicals* **28**, No. 3, 36-9, 90(1952). Survey of synthetic detergent production since the beginning of the industry, relation to the soap industry, and estimates of the future.

Measurement of the capacity to disperse calcium soaps. Mme. S. Dupin and G. Reutenauer (Lab. Chevreul, Paris). *Bull. mens ITERG* **5**, 519-22 (1951). An empirical method is described for the classification of detergents according to their power of preventing precipitation of soaps by hard water. (*Chem. Abs.* **46**, 1784)

Soaps or synthetics? Helmut Stupel (Seifenfabrick Hochdorf, Switzerland). *Soap, Perfumery, Cosmetics* **25**, 162-3(1952). An historical survey of the development of the synthetic detergents industry.

New, improved deodorant soap. Anon. *Soap Sanit. Chemicals* **28**, No. 3, 73(1952). A new bactericide (Wirkstoff FS 64) developed in Germany is said to maintain its bactericidal action in a soap medium and imparts a deodorizing action to the soap. FS 64 is a combination of stearates and glycerin and the active ingredient is F 10 which is a formaldehyde derivative. A 3% concentration of FS 64 in soap is said to eliminate perspiration odors. FS 64 is said also to be useful in dentifrices, cosmetic products, lotions, face powders, etc.

The interpretation of published x-ray measurements on detergent solutions on the basis of an intermicellar equilibrium. P. A. Winsor (Shell Refiging & Marketing Co., Ltd., Thornton Research Centre, Chester, England). *J. Phys. Chem.* **56**, 391-9(1952). Published x-ray measurements on solutions of colloidal electrolytes and ethylene oxide derivatives are shown to be qualitatively in accord with an intermicellar equilibrium. The conception of an equilibrium between three main types of micellar configuration, which has been used earlier to interpret the phase relationships and electrical conductivity behavior of certain solubilized systems, has been shown to give a coherent qualitative interpretation of published x-ray measurements on detergent solutions.

Saponin: industrial utilization as textile auxiliary. I. Wetting and lime soap dispersing properties. I. S. Uppal and R. L. Mehta. *J. Sci. Industr. Res., India,* **10B**, No. 8, 190-5(1951). The preparation of saponin from the pericarp of soapnut is described. Experiments have been carried out to investigate the wetting power and calcium soap dispersing power of saponin as compared with other detergents. Results are presented and these show that saponin is superior to the proprietary detergents ordinarily used in the textile industry, particularly in respect to its performance in the presence of hard waters, at high temperatures, and in neutral or alkaline media.

Quantitative data on the adsorption of a detergent by cotton sheeting under textil processing conditions. L. H. Flett, L. F. Hoyt and J. Walter (National Aniline Division—Allied Chemical & Dye Corp., New York). *Am. Dyestuff Reptr.* **41**, 139-43 (1952). Improved analytical procedures capable of assaying minute quantities of anionic detergents have made it possible to study both the amount of Nacconol adsorbed from solution by textile fibers and the factors which govern that adsorption. It has been shown that adsorption increases rapidly with the increasing concentration up to a concentration of 0.2% on the pure organic basis. Raising the temperature increases the rate of adsorption, but it does reach a maximum for any fiber, which is dependent on the concentration of the detergent in solution. The amount adsorbed from solution varies with the fiber; the adsorption on cotton is relatively low compared with silk and wool.

Surface hydrolysis in sodium lauryl sulfate solutions and its effect on surface tension and on adsorption at the solids-aqueous solution interface. Melvin A. Cook and Eugene L. Talbot (University of Utah, Salt Lake City, Utah). *J. Phys. Chem.* **56**, 412-6(1952). Hydrolytic adsorption at the free surface of aqueous sodium lauryl sulfate solutions is shown (1) by pH measurements correlated with (foam) extraction of the soap, and (2) by means of surface tension vs. pH curves at constant concentration and ionic strength. Values of the (apparent) surface hydrolysis constant of 10^{-7} to 10^{-8} were obtained from the γ vs. pH curves. However, the hydrolytic adsorption may perhaps be due merely to a fatty acid impurity in sodium lauryl sulfate. A series of surface tension-concentration curves were obtained at various ionic strengths and a thermodynamic analysis and interpretation given.

The role of foam in detergent action. D. G. Stevenson. *J. Soc. Dyers Colourists* **68**, 57-9(1952). Foams have the power of sucking oil into the junctions between the liquid films or lamellae which separate air bubbles, probably because the curvature of the water-air surface is greatest, and the pressure in the liquid lowest, at these junctions. When a foam carrying lines of oil along these junctions breaks, the oil is dispersed as fine droplets, therefore foams can assist emulsification of oil. It is concluded that foam may play a very definite part in the removal of oils and fats from smooth surfaces, such as are met with in dishwashing. However, it is unlikely that foam will aid significantly the removal of soil in laundering; although some air bubbles may pass through the interyarn spaces in a fabric during washing, none is likely to pass through the interfiber spaces where the soil is more firmly held.

Textile application of brighteners. Opal L. Sherburne (Antara Products Division, General Dyestuff Corp.) and John P. G. Beiswanger (General Aniline & Film Corp., New York). *Am. Dyestuff Reptr.* **41**, 144-8(1952). The use of brightening agents in whitening partially bleached muslin during soaping and during peroxide bleaching is discussed along with their use in whitening the background of printed material, and whitening bleached wool. An instrumental method is presented for the evaluation of brighteners when used in bleaching and soaping operations on muslin. The technique involves measurement, under controlled conditions, of the fluorescent brightness when brightening agents have been applied to a substrate. Thus from these measurements one can evaluate under use conditions the strength ratios of brighteners, their comparative dollar value, and their stability to such materials as bleaching agents.

Studies on polyelectrolytes, I. Sodium carboxymethylcellulose. Sadhan Basu and Pares Ch. Das Gupta. *J. Colloid Sci.* **7**, 53-70 (1952). Various physicochemical properties of sodium carboxymethylcellulose solutions, namely, viscosity, pH-effect, salt-effect, and conductivity have been measured. The peculiar characteristics of the solutions compared to those of neutral polymers on the one hand and *strong* electrolyte on the other have been attributed to the polyelectrolytic nature of sodium carboxymethylcellulose.

Yields from low-grade fats in the manufacture of soaps. G. Reutenauer and Mme. S. Dupin (Lab. Chevreul, Paris). *Bull. mens ITERG* **5**, 393-400(1951). (*Chem. Abs.* **46**, 1783).

The synthetic surface active agents industry and the soap industry. Their future developments and relations. G. Nebbia and L. Geshi. *Olearia* **5**, 358-361(1951). A review of recent developments in the United States which tend to show that both soap and synthetic detergents have their own fields of usefulness.

PATENTS

Surface-Active Compounds. Ronald A. Henry (Procter & Gamble Co.). *U. S. 2,584,701.* The mixture of sodium salts of the sulfonation products of a compound of the formula $RCOOCH_2CON(Z)CH_2CH = CH_3$ where RCO represents acyl radicals of fatty acids derived from an oil of the coconut oil group, and Z is a member of the group consisting of hydrogen and alkyl radicals of not more than 3 carbon atoms, said salt being soluble in water and having pronounced washing, sudsing, and wetting power when in aqueous solution.

Detergent composition and process of preparation. Harland H Young and Kurt H. Spitzmueller (Swift & Co.). *U. S. 2,586,496.* An improved detergent composition having balanced sudsing properties obtained by a mixture of from 60 to 80% by weight of the condensation product of diethanolamine and a carboxylic acid having between 8 and 14 carbon atoms per molecule, and from 20 to 40% by weight of the diethanolamine soap of a higher fatty acid having between 16 and 18 carbon atoms per molecule.

Detergent composition of low solvent properties. Louis McDonald. *U. S. 2,587,637.* Preparation of a detergent which may be incorporated with fibrous, abrasive and filler materials and which will not dissolve quickly, consisting of a sodium soap of high molecular weight fatty acid, 0.1% to 5% of a water-insoluble ethyl cellulose to retard solution of the soap and a partial high molecular weight fatty acid ester of a polyhydric alcohol.

Detergent composition. John E. Hanson (California Research Corp.). *U. S. 2,589,190.* A detergent composition comprising an alkaryl sulfonate detergent containing from 8 to 20 carbon atoms in the alkyl chain and a minor amount of a water-soluble, alkali metal salt of a celluronic acid, sufficient to enhance the detergency characteristics of the detergent.

Compositions containing soapless detergents. F. J. Pollok (Imperial Chemical Industries, Ltd.). *British 666,130.* Production of washing flakes or powders which do not separate out in storage by treating in an aqueous medium a soapless detergent of the kind which is an oily liquid (an ethylene oxide condensation product of an alkyl phenol), with a water-soluble cellulose ether and converting the jelly formed to flakes or powders, by drying the jelly into sheet form and treating the sheet on a soap flaking machine.

Improvements relating to detergents. D. G. Kerr. *British 666,496.* A process for making a detergent with improved soil removal on cellulose fabrics and an absence of harsh alkalinity which comprises mixing ammonium carbonate or a mixture of salts which will yield ammonium carbonate by double decomposition, with an alkali metal salt of a sulfonic acid derived from a long chain paraffin and/or with an alkali metal sulfate of a long chain fatty alcohol.