



FIG. 2. Changes in oxygen content and iodine number of methyl oleate during autoxidation. (A = hydroperoxide oxygen, B = total non-ester oxygen, C = oxygen other than ester and hydroperoxide, and D = iodine number.)

ple, rapid, and applicable to the analysis of materials containing a mixture of different peroxidic groups. The application of this nonaqueous polarographic technique to the study of the changes occurring during the prolonged autoxidation of methyl oleate at 80°C. has permitted the identification and quantitative estimation of the hydroperoxide formed during this process. The selectivity of the polarographic method makes it possible to identify and measure the hydroperoxide even when present with other peroxidic forms. A comparison of the data obtained by this

new technique and by the chemical peroxide method has been made and shows that the polarographic method for hydroperoxides is specific and quantitative.

By means of a direct oxygen method it has been possible to follow accurately the change in the oxygen content during the autoxidation. These data have confirmed the work of other investigators using other methods, in that the oxygen absorbed in the initial stages is used primarily in hydroperoxide formation, whereas in the latter stages the oxygen is consumed to form non-hydroperoxidic materials. The methods used in this study should be of great value in studying the changes which occur in drying oils for these changes are induced by autoxidation.

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REFERENCES

1. Farmer, E. H., and Sutton, D. A., *J. Chem. Soc.*, 1943, 119-122.
2. Lewis, W. R., and Quackenbush, F. W., *J. Am. Oil Chem. Soc.*, 26, 53 (1949).
3. Riemenschneider, R. W., Turer, J., and Speck, R. M., *Oil and Soap* 20, 169 (1943).
4. Ricciuti, C., Coleman, J. E., and Willits, C. O. (in press).
5. Unterzaucher, J., *Ber.*, 73B, 391 (1940).
6. Walton, W. W., McCulloch, F. W., and Smith, W. H., *J. Research Natl. Bur. Standards*, 40, 443 (1948).
7. Willits, C. O., Ricciuti, C., Knight, H. B., and Swern, D., *Anal. Chem.*, 24, 785 (1952).

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ABSTRACTS

E. S. Lutton, Editor

• Oils and Fats

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Hydroxylation: new unit process. Anon. *Chem. Eng.* 60(8), 118, 120, 122(1953). The manufacture from vegetable oils and animal fats of hydroxylated and acetylated products primarily for use as plasticizers for vinyl plastics is described with a flowsheet and photographs. Fatty acids are esterified with butanol and H_2SO_4 to yield butyl esters which are hydroxylated with peracetic acid. Simultaneous partial acetylation gives butyl hydroxy-acetoxy esters which are either recovered for sale or are further acetylated with acetic anhydride to polyacetoxy esters.

Comparative hydrogenation of unsaturated fatty acids, C_{16} , C_{18} and C_{22} . P. A. Artamonov (Lab. Hidrogenizatsii, Vsesoyuz. Nauch.-Issledovatel. Inst. Zhirov.). *Zhur. Obshchei Khim.* 23, 216-18(1953). The rate of hydrogenation of unsaturated acids generally declines with increase in molecular weight. Hydrogenation of the acids in Et_2O at room temperature over Pd black gave the following rates (k) of hydrogen uptake per min. in ml. For hexa-2-decenoic acid at 5 min. $k = 5.0$; 25 min. 0.8. For octa-2-decenoic acid: at 5 min. $k = 4.26$; 25 min. 1.2. 2-Docosenoic acid in 5 min. $k = 2.8$; 25 min. 1.85. 9-Octadecenoic acid in 5 min. $k = 7.0$; 20 min. 0.17. 13-Docosenoic acid gave k values as follows: in 5 min. 5.0; 25 min. 1.6. The slow hydrogenation of the latter acid can explain the difficulties in hydrogenation of such natural oils as rapeseed, etc., since erucic acid adds H_2 much less rapidly than do the acids found in sunflower or linseed oils. (*Chem. Abs.* 47, 7235)

Cream for protecting hands from fats, oils, dyes, and hydrocarbons. Felice Bevilacqua and Mario Porro. *Ital.* 469,137,

Feb. 18, 1952. The following example is given: stearic acid 10, lanolin or bees wax 1.5, glycerol 5, casein 0.3, NH_3 0.5, and H_2O 35 parts. Casein may be replaced by a larger amount of neutral soap. Coloring matter, deodorants, or antiseptic substances may also be added. (*Chem. Abs.* 47, 7170)

Influence of processing on the Baudouin color test of sesame oil. P. T. Bhide and J. G. Kane (Univ. Bombay). *J. Sci. Ind. Research (India)* 12B, 68-70 (1953). Addition of a minimum of 5% sesame oil to edible hydrogenated oil is compulsory in India so as to obtain a definite depth of red color in the Baudouin test. Processing of sesame oil by neutralization, hydrogenation, or bleaching reduces the sesamol content and, therefore, the red color in the Baudouin test. It is recommended that 0.5% raw oil be used instead of 5% processed oil to give depth of color without impairing quality of the finished product. (*Chem. Abs.* 47, 7238)

Determination of fat in whey cheese. Ingvge Buchholz and Ingolf Smith (Staatl. Norweg. Landwirtschaftlichen Kontrollstation, Oslo). *Z. Lebensm.-Untersuch u-Forsch.* 96, 245-8 (1953). The Norwegian whey cheese, Mysost, contains no casein and the usual method for fat determination in cheeses is not generally suitable in this product. Investigation of the methods based on decomposition with HCl and extraction showed that Et_2O -petroleum mixed extraction solvent in the ratio of 1:4 is preferred. (*Chem. Abs.* 47, 6569)

The chemical and physical characteristics of Danish butter. Giuseppe Cerutti (Staz. sper. Freddo, Milan). *Ann. sper. agrar. (Rome)* 7, 189-192(1953) (English summary). In the attempt to control the considerable amounts of butter arriving upon the Italian market from Denmark, normal values were found for Riechert-Meissl no. and the titer of volatile fatty acids soluble in water. However, the Polenske no. was 3.45 (average of 73 samples) as compared with values of between 2.0 and 3.2 for genuine butters from Italy. Also Italian but-

ters do not show an index of refraction below 44.2 while the average of the Danish samples was 43.9. It is accordingly difficult to distinguish genuine butters from Denmark from certain imitations and adulterated samples that appear on the Italian market. (*Chem. Abs.* 47, 5572)

Utilization of mixed substrates in fatty acid synthesis by *Fusarium lini* bolley. R. J. Coleman and F. F. Nord (Fordham Univ.). *Arch. Biochem. Biophys.* 45, 183-9 (1953). Maximum yields of fats were obtained with substrates containing 1.2% acetate and 1% glucose. Such mixed substrates yielded fats of higher iodine value than those produced from either glucose or acetate alone. In one culture in an acetate (1.2%)-glucose (1%) medium the mycelium contained 10% fat having iodine no. 122.6 and containing oleic acid 29.7%, linoleic acid 35.9% and linolenic acid 11.3%. Glucose was used more rapidly than acetate for fat formation.

Refractive indices of some saturated and monoethenoid fatty acids and methyl esters. B. M. Craig (Prairie Regional Lab., Natl. Research Council, Saskatoon, Sask., Can.). *Can. J. Chem.* 31, 499-504 (1953). Measurements of n were made on purified compounds at 5° intervals (when liquid) in the range of 20-85°C. The data are represented as follows (when $t = ^\circ\text{C}$): Me oleate, 1.45968-0.000377t; Me eicosenoate, 1.46134-0.000372t; Me erucate, 1.46288-0.000369t; Me palmitate, 1.44830-0.000379t; Me stearate, 1.45149-0.000375t; Me arachidate, 1.45363-0.000366t; Me behenate, 1.45554-0.000358t; oleic acid, 1.46677-0.000354t; eicosenoic acid, 1.46805-0.000351t; erucic acid, 1.46892-0.000346t; palmitic acid 1.45589-0.000355t.

Oleorefractometric index of peanut oils. P. Desnuelle and M. Naudet (Lab. nat. mat. grasses, Marseille, France). *Bull. mens. inform. ITERG* 7, 181-5 (1953). The empirical indexes obtained with an oleorefractometer are not influenced by the mucilaginous substances contained in the raw oils. They varied between 4 and 6 degrees in 41 industrial samples of peanut oil. Seven samples prepared in the laboratory by extraction with petroleum ether showed values between 2.75 (Niger peanuts) and 6 (Dahomey). Traces of solvent remaining in the extracted oil markedly lower the indices. (*Chem. Abs.* 47, 7328)

Animal fats. I. The component acids of deer fat and of camel fat. F. D. Gunstone and R. P. Paton (Univ. Glasgow). *Biochem. J.* 54, 617-21 (1953). Deer fat (*Cervus elaphus*, petroleum ether-extracted), deer-fat acids, camel fat (*Camelus bactrianus*, acetone-extracted) and camel-fat acids, resp., possessed the following characteristics: I no. 35.5, 32.4, 35.1, 36.8; sapon. equivalent 284.9, 266.2, 282.2, 270.4; free fatty acids, 2.0,, 2.1,, The fatty acid compositions of both fats were determined by crystallizing saturated acids from methanol at -20° and dividing the remaining acids by crystallization from acetone at -50°. Each fraction was methylated and distilled. The component acids for deer and camel fats, resp., were: lauric 0.01,, myristic 4.43, 6.25; palmitic 25.06, 28.69; stearic 35.23, 27.36; tetradecenoic 0.49, 0.54; hexadecenoic 2.80, 3.19; octadecenoic 25.15, 26.30; octadecadienoic 2.60, 1.86; octadecatrienoic 2.46, 0.92; eicosenoic (unsaturated acids above C_{18}), 3.01.

Animal fats. II. The component acids of python fat. F. D. Gunstone and R. P. Paton (Univ. Glasgow). *Biochem. J.* 54, 621-5 (1953). Fat extracted with acetone from tissue of a 19-ft. *Python reticulatus* and the acids of that fat, resp., possessed the following properties: sapon. equivalent 288.5, 275.9; I no. 73.0, 76.1; free fatty acids (as oleic) 0.3%,, The mixed fatty acids were fractionally crystallized from acetone at -60, -40, and -20°, methylated, the esters fractionally distilled, and the fractions identified. The fatty acid composition of the python fat was thus found to be (%): myristic 1.3, palmitic 19.7, stearic 10.8, arachidic 1.2, tetradecenoic 0.5, hexadecenoic 3.9, hexadecadienoic trace, octadecenoic 47.0, octadecadienoic 10.7, octadecatrienoic 0.8, acids above C_{18} 4.1.

Analysis of lipids by spot tests on filter-paper disk chromatograms. M. H. Hack (Univ. of Chicago). *Biochem. J.* 54, 602-5 (1953). A chromatographic technique for lipids involves adding 10^{-2} μ moles of lipid to the center of a filter-paper disk, developing the chromatogram with solvents and staining it with specified reagents.

Tung hulls and press cake. Raiford L. Holmes and Robert S. McKinney (U. S. Tung Oil Laboratory, Bogalusa, La.). *U. S. Bur. Agr. and Ind. Chem. AIC-357*, 14 pp., June, 1953. The inner hull, outer hull and shell of tung fruit weathered 0, 2 and 6 months were analyzed for pentosans, lignin, cellulose, α -cellulose, N, H_2PO_4 , Cu, Fe, Mn, ash, water- and alcohol-solubles. Tung press cakes (25) from 14 domestic mills contained (averages): as %—oil 6.10, crude fiber 42.9, pentosans 11.3, N 3.97, ash 5.35, H_2PO_4 1.28, potash 2.69, and as p.p.m.—

Cu 12, Fe 99, and Mn 76. Present uses (fertilizer and mulching) and possible new uses are discussed.

Effect of iron content on quality of Quebec butter. J. P. Julien and G. Martin (Provincial Dairy School, St. Hyacinthe, Quebec). *Can. Dairy Ice Cream J.* 31(7), 36-8, 50 (1952). The iron content of 68 butter samples, from eight areas of the province of Quebec, has been determined. The average iron content was 0.905 p.p.m. with extremes of 0.32 and 1.65 p.p.m. The relation between the iron content and the degree of oxidation (as peroxide index) has been studied. When all the samples have been considered no significant relation has been found between the iron content and the increase in the peroxide index during the storage. In the oxidized samples containing less than 0.15 p.p.m. Cu, an iron content over 1.00 p.p.m. caused a very significant increase in the peroxide index. This has been the case in 16 (23.5%) of the samples. (*Chem. Abs.* 47, 6568-9)

The induction periods of mixtures of oils and fats with fully saturated glycerides freed from antioxidants. A. R. S. Kartha (Maharaja's Coll., Ernakulam). *J. Sci. Ind. Research (India)* 11B, 263-4 (1952). A nonvolatile diluent free from oil and fat antioxidants was prepared by repeated $MgCO_3$ - $KMnO_4$ oxidation of coconut oil; the acid and neutral fractions were separated; the neutral fraction was washed in ethereal solution, first with Na_2CO_3 and then with NaOH; a second oxidation and washing gave a product with zero I no. and zero acid no. Induction periods of mixtures of a refined maize oil and two refined and hydrogenated and two deodorized peanut oils diluted to different extents were not affected. (*Chem. Abs.* 47, 7236)

Polarographic investigations in the field of fats. I. Principles of polarography and possibilities of its use in the analysis of fats and related materials. H. P. Kaufmann and J. Baltes. *Fette u. Seifen* 55, 153-9 (1953). A review of the history, principles and apparatus of polarographic measurements is followed by a discussion showing opportunities for its use in analyzing oils and fatty materials for antioxidants, vitamins, driers, peroxides, aldehydes, and other oxidizable or reducible components.

The determination of moisture and fat in cocoa products. A. Knapp. *Rev. intern. chocolat.* 7, 263-4, 266 (1952). It is recommended that moisture in cocoa and chocolate products be determined by drying at 100° for at least 4 hrs. or until consecutive weighings followed by drying periods of at least 30 min. give a difference of less than 1% moisture. Drying under vacuum is recommended for products containing levulose or other easily decomposed substances. The International Method for determination of fat was compared with the coagulation method of Hadorn (*Chem. Abs.* 44, 7457) and the centrifuge method of Kobe (*Chem. Abs.* 44, 7461). The International Method was found to be more precise. (*Chem. Abs.* 47, 7135)

Tall-oil refining. Åke Linder. *Acta Polytech. Chem. Met. Ser.* 2, No. 10, 56 pp. (1951). Tall oil is refined in Sweden, Finland, Germany, Russia, and in the U.S.A. The method most used commercially involves distillation under reduced pressure, centrifuging the rosin acid crystals after fractionation from a continuous still of the fatty acids and drawing off pitch residues from the bottom of the still. The rosin acids are used in the manufacture of alkyd resins and paper sizing, the fatty acids for soap, and the pitch for floor tile, paper size and road paving. Many other processes have been explored, developed, patented, and some have been used on a semi-commercial scale, but none have been used to the extent of the distillation-centrifugation methods largely developed in Sweden by L. 159 references. (*Chem. Abs.* 47, 7214)

Influence of culture conditions on growth of lipogenic molds, *Fusarium* genus. E. V. Litvinova and O. G. Raevskaya (All-Soviet Brewing Research Inst., Moscow). *Microbiologiya* 21, 572-8 (1952). *Fusarium* micelles contain fat, protein, carbohydrates, and ergosterol, as well as compounds from the nutrient medium. The fats resemble vegetable oils in physical and chemical properties. *Fusarium* (optimum growth temperature 26-27°) ferments glucose, sucrose, maltose, xylose, arabinose, and (less readily) lactose. It accepts organic or inorganic N sources and has a wide pH tolerance (3.2 to 7.8). For large yields of high-fat micelles the medium must be aerated. A molasses mash, 5° Balling, with 0.05% K phosphate, ferments readily (sugar consumption nearly 100%) with a good yield of micelles containing 40% fat and 25% protein. On sulfite liquor micelles were obtained with 28.6% fat and 29.3% protein; sugar consumption was 81%. (*Chem. Abs.* 47, 7035)

The relation between fat and protein in milk. T. Lonka (Suomen Karjanjalostusyhdistys, Tikkurila, Finland). *Maataloustieteellinen Aikakauskirja* 24, 176-80(1952). The casein and butter-fat contents of milk were determined over one lactation period for 75 different cows. Monthly correlation coefficients between fat content and protein content were low enough to justify further work toward the objective of breeding cows with low feed-protein requirements. (*Chem. Abs.* 47, 7129)

Vitamin A in fish liver: an improved method for vitamin A determination in fish liver. C. S. Martín Pérez (La. Ind. S. A., Larache, Spain). *Inform. quim. anal.* (Madrid) 7, 1-2 (1953). To a 4-g. sample of minced liver is added 1.2 g. of pulverized KOH. The mixture is ground in a previously chilled mortar. The digest is mixed with 16 g. of defatted wheat flour and the mixture is transferred to a column and extracted with peroxide free Et₂O until 100 ml. have passed through the column. A 5-ml. aliquot is transferred to a 50-ml. dish and the solvent removed *in vacuo*. The residue is taken up in EtOH and the absorption determined at 325, 310 and 334 m μ . The determination requires less than 70 min.. The results are in good agreement with those of other methods. (*Chem. Abs.* 47, 7164)

Treatment of cottonseeds by the scheme: single pressing and continuous extraction. M. A. Minasyan and E. Z. Plyushkina. *Masloboino Zhirovaya Prom.* 18(3), 7-9(1953). The economics of the process and a detailed description are given. (*Chem. Abs.* 47, 7238)

Nutritive value of butterfat compared with that of vegetable fat. I. Biological experiments. A. Experimental results. C. Nieman, E. H. Groot, and B. C. P. Jansen (Netherlands Inst. Natl. Nutrition, Amsterdam). *Proc. Koninkl. Ned. Akad. Wetenschap.* 55C, 587-97(1952). The nutritive value of May-grass butterfat or butter fatty acids was compared, in rat-growth studies, with that of peanut oil or fatty acids of peanuts, vitamins A and D being supplied in the fatty acid diets either as carotene and calciferol or as the nonsaponifiable fraction of butterfat. The data include published data of Boer and Jansen plus unpublished data on 105 litter-mate pairs and 17 litter-mate triads of rats. **B. Discussion of results.** *Ibid.* 598-604. Under the conditions, butterfat had a higher nutritive value than peanut oil or peanut oil supplemented by either 300 γ of β -carotene plus 0.35 γ calciferol/week or by the nonsaponifiable of butter. The superiority of butterfat is localized in the saponifiable fraction. The unknown growth factor is stable at -10° for at least 12 months; it is present in winter butter.

II. Statistical analysis. *Ibid.* 605-16. The above data are analyzed in detail. (*Chem. Abs.* 47, 7048)

Isopropyl myristate. G. S. Pears (Brit. Industrial Solvents, Ltd., London). *Perfumery Essent. Oil Record* 44, 84-90, 101 (1953). The properties and characteristics relating to formulations are reviewed. The uses in powder, make-up preparations, lipsticks, rouge, eye-shadow, creams, ointments, and liniments with 22 formulations are given. (*Chem. Abs.* 47, 7166)

Standardizing the color of butter. August Reinart and R. W. Brown (Univ. Manitoba). *Can. Dairy Ice Cream J.* 31(5), 31-3, 78(1952). A method is described for standardizing the color of butter by first measuring natural color of butterfat in cream and thus predetermining the amount of artificial color which should be added to the cream to give the butter a desired standard shade of color. (*Chem. Abs.* 47, 6568)

The drying of cores. I. F. Roll (Duisburg, Germany), and A. Brust. *Giesserei* 39, 678-81(1952). This work reports on the chemistry of drying oils used in the foundry. As core oils, drying oils, such as linseed, are used. (*Chem. Abs.* 47, 6841)

Surface tension and viscosity in fats which become rancid. Leoncio Romero A. (Univ. Chile, Santiago). *Tesis quim., Univ. Chile* 2, 62-76(1950). Olive, commercial edible cod-liver (light and dark), castor, and linseed oil were observed for 4 months during which they were exposed only to artificial light for several hours. Storage temperature was 12-13.5 $^{\circ}$. The density and viscosity (Stokes' method) increased. A relation between density and viscosity was evident only with castor and cod-liver oils (*Chem. Abs.* 47, 7233)

Composition of Mexican butter. Armando Ruiz and Rene O. Cravioto (Inst. nacl. nutriologia, México D. F.). *Ciencia* (Mexico) 12, 141-143(1952). Tables representing analytical data of 24 samples of butter, including 2 from goat milk and 2 imported products, are presented. The data give H₂O fat, ash, carotene, vitamin A, and the m.p.s. and the usual indexes of fatty acids. Some samples with a low or negative Kirschner index were also low or void in vitamin A. The carotene showed wide variations. (*Chem. Abs.* 47, 5572)

Comparative evaluation of antioxidants for groundnut oil and its hydrogenated products. M. R. Sahasrabudhe (Central Food Technol. Research Inst., Mysore). *J. Sci. Ind. Research* (India) 12B, 63-7(1953). Eight antioxidants were tested at 4 concentrations (0.01-0.10%) by active-oxygen method. Effects were greatest at 0.02% and above. Butylated hydroxyanisole and propyl gallate, or both, are best for groundnut (peanut) oil. Hydroquinone and tocopherol are least effective with peanut oil, but hydroquinone is better with hydrogenated oils than tocopherol, sesamol, lecithin, or gum guaiac. Butylated hydroxyanisole and gum guaiac are individually best for both peanut and hydrogenated peanut oils. The synergistic effect of citric acid and lecithin with butylated hydroxyanisole and propyl gallate was more pronounced in the original than in the hydrogenated oils. (*Chem. Abs.* 47, 7238)

Metal deactivators for vegetable-oil systems. Arthur W. Schwab (Bradley Univ., Peoria, Ill.). *Univ. Microfilms* (Ann Arbor, Mich.) Publ. No. 4900, 73 pp. (*Chem. Abs.* 47, 7237)

Rational utilization of wastes from refining of fats and oils. A. G. Sergeev. *Masloboino Zhirovaya Prom.* 18 (2), 11-4 (1953). The refining processes and glycerol production are discussed from the practical viewpoint. (*Chem. Abs.* 47, 7234)

New Zealand fish oils. VI. Seasonal variations in the composition of New Zealand groper (Polyprion oxygeneios) liver oil. F. B. Shorland (Fats Research Lab., Dept. of Sci. and Ind. Research, Wellington, N. Z.). *Biochem J.* 54, 673-7(1953). The percentages of vitamin A, cholesterol, total unsaponifiable matter, and phospholipide, as well as the iodine no. of the liver oil, increases after spawning (Sept.), while the oil content of the liver is reduced. Livers of male and female fish caught in Sept. contained, resp.: % oil 6.45, 8.19; % of total oil 2.8, 2.4; % vitamin A in oil 14.1, 11.1; % of total vitamin A 88.9, 93.5. Heads contained 51.4% (male) and 43.9% (female) of the total oil in the fish but head oil contained no vitamin A.

Composition of total fatty acids of oil from pulp of *Elaeis melanococca* gathered at Yangambi. M. P. Staner. *Inst. roy. colonial belge, Bull.* 21, 730-7(1950). The Me esters of a mixed sample of the total fatty acids (from the fruit pulp from 20 trees) were fractionally distilled (Hilditch method) after a preliminary separation by crystallization from Et₂O at -30° , and COMe₂ at -40° , and by the Pb salt-EtOH method. The percent composition of the acids was: myristic 1.0, palmitic 32.6, stearic 4.7, arachidic 0.5, palmitoleic 0.9, oleic 47.5, linoleic 12.0, and linolenic 0.8; the last 2 figures were determined spectrographically. The (observed) characteristics of the oil (I no. 65.2, sapon. equiv. 287.4) and the composition of its acids are discussed with reference to its classification among African palm oils. (*Chem. Abs.* 47, 7235)

The cholesterol content of marine animal oils commercially produced in Norway. Wilhelm Thuesen. *Norsk Hvalfangst-Tidende* 42(1), 25-9(1953). The cholesterol content of 50 fish, whale, and seal oils was investigated. The total unsaponifiable matter in the oils varied from 0.21 to 40.1%; the cholesterol in the oils varied from 0.05 to 10.4%. The unsaponifiable matter in sperm-whale oil and in turbot-liver oil contained 0.87 and 90% cholesterol, resp. The liver-oil samples containing the most cholesterol were halibut, *Hippoglossus hippoglossus*, 7.5, 7.6, 7.6%; turbot, *Reinhardtius hippoglossoides*, 7.7, 8.1, 10.4%; and Greenland shark, *Somniosus microcephalus*, 3.6, 3.9, and 4.0%. Oil obtained from the livers of blue whales, *Balaenoptera musculus*, by extraction with benzene, contained 8.3, 9.1, and 9.3% cholesterol. (*Chem. Abs.* 47, 7239)

Effect of irrigation on oil cultures. E. P. Trepachev. *Masloboino Zhirovaya Prom.* 18(3), 3-5(1953). Irrigation improves the oil yield by sunflower plants, but the response varies with the variety. Increases up to 4-5% are not unusual. Under conditions of ample water supply the protein content in the seeds of sunflower and flax plants declines. (*Chem. Abs.* 47, 7239)

The chemical composition and use of tomato seeds in feeds. L. Villanua Fungairiño and C. Clavero (Esenella nacl. sanidad, Madrid). *Anales bromatol.* (Madrid) 4, 381-8(1952) (English summary). The tomato-seed by-product of Spanish canneries was analyzed. The high protein content of the cake indicates its usefulness in feeds or fertilizers, and the high digestibility of the oil indicates its usefulness in rations for animals. (*Chem. Abs.* 47, 7135)

Refining of cottonseed oil with hypochlorite. A. M. Zharskii (Karkov Butter Trust). *Masloboino Zhirovaya Prom.* 18(2), 23(1953). The oil is neutralized with alkali and then clarified with NaOCl solution (from Na₂CO₃ and chlorinated lime) at 45 g./l. of active Cl concentration. The dosage is 3 kg. active

Cl per ton of oil. Reduction of color to .05 of the initial level is readily obtained. (*Chem. Abs.* 47, 7237)

Big shift to solvent process. Anonymous. *Soybean Digest* 13, No. 10, 18(1953). Summary of soybean oil production data for the year Oct. 1, 1951, to Sept. 30, 1952, as reported by the U. S. Department of Agriculture.

A test for oil content? Let's put oil in its rightful place! J. Schmidling. *Soybean Digest* 13, No. 10, 14-15(1953). The need for an oil test method in grading soybeans is discussed. The use of electronic oil testing equipment (Steinlite 300 LOS Oil Tester) is proposed for rapid grading of individual lots and for plant control in determining residual oil in press-cake.

Sorting molecules by size and shape. E. V. Truter. (The University, Leeds). *Research* 6, 320-6(1953). Brief review of the structure, physical and chemical properties, and applications of urea complexes. Examples of uses of complex formation include removal of free fatty acids from waxes, fractionation of wool wax alcohols, sperm oil or mixtures of fatty acids, and prevention of the autoxidation of oleic acid.

Unsaturated fatty acids. Part I. The synthesis of erythrogenic (isanic) and other acetylenic acids. H. K. Black and B. C. L. Weedon. *J. Chem. Soc.* 1785(1953). The structure, $(CH_2=CH[CH_2]_4C\equiv C-C\equiv C[CH_2]_7CO_2H)$, of erythrogenic (isanic) acid has been confirmed by synthesis. Oxidative coupling of a mixture of dec-9-ynoic acid and oct-1-en-7-yne gave the expected three products, one of which octadec-17-ene-9,11 diynoic acid was isolated and identified with natural erythrogenic acid. This acid is found in the oil from the kernels of the tree *Onguekoa Gore Engler* which is indigenous to equatorial Africa.

Relation of feeds to stability of turkey carcass fat. *Nutrition Reviews* 11, 210(1953). The type of dietary fat fed can affect the storage life and eating quality of turkey carcasses. The effects on storage quality, however, were not excessive unless fats were present in the diet that contained appreciable amounts of highly unsaturated fatty acids. Of the dietary fats tested, fish oils would appear to be the most likely source of such fats for producing unstable or off-flavor turkey carcasses under present commercial practices.

Branched-chain fatty acids. XXVI. Synthesis of optically active acids of use in the study of the structure of C₂₇-phthienoic acid. Partial thermal racemization of (—)-5-methyl-2-tridecenoic acid. J. Cason, N. L. Allinger, and C. F. Allen. (Univ. of California), *J. Org. Chem.* 18, 857(1953). There is described an efficient method for converting 2-alkylalkanoic acids to the corresponding 2-alkyl-2-alkenoic acids. The method is applicable to acids having additional substituents on the chain, and it has been applied to synthesis of 2,5-dimethyl-2-heptadecenoic acid and L-(+)-2,5-dimethyl-2-tridecenoic acid. The low molecular rotation of the latter acid makes untenable the assignment of the second methyl in C₂₇-phthienoic acid to the 5-position.

Branched-chain fatty acids. XXV. Methods of synthesis of 2-alkenoic acids. J. Cason, N. L. Allinger, and G. Sumrell (Univ. of California). *J. Org. Chem.* 18, 850(1953). Trans-2-alkenoic acids, not substituted at the double bond, may be conveniently prepared from the corresponding saturated acids by α -bromination with bromine, followed by dehydrohalogenation with potassium tert.-butoxide.

A glycerol dehydrogenase from Escherichia coli. R. E. Asnis and A. F. Brodie. *J. Biol. Chem.* 203, 153(1953). A relatively heat-stable, DPN-linked glycerol dehydrogenase was isolated from a strain of *Escherichia coli* and partially purified. Oxidation of the glycerol to dihydroxyacetone in a 1:1 molar ratio with DPN + reduced was demonstrated, and the reaction shown to require no inorganic phosphate.

Methods for the determination of lipids in oil bearing seeds. E. Andre and M. Carboueres. *Oleagineux* 8, 441-449(1953). Methods for determining the lipids in oil seeds or press cakes are reviewed and the results of a number of laboratory tests that were used to compare the procedures are discussed.

First contribution to the knowledge of a new process for the extraction of olive oil. G. B. Cerletti and P. V. Ferrari. *Olii Minerali—Grassi e Saponi—Colori e Vernici* 30, 89-93(1953). The machinery and the processing of olives and olive oil in the new continuous Diefenbach process are described.

The colorimetric determination of tocopherol. C. Domart. *Annales Pharmaceutiques Françaises* 10, 199(1952). An exactly measured volume of an alcoholic solution of tocopherol is added to a 25-ml. volumetric flask, 1 ml. of a 0.2% solution (alcoholic) of ferric chloride is added, the mixture is shaken, 1 ml. of a 0.5% alcoholic solution of dipyrilidyl is added and the mixture is shaken and allowed to stand for 8 to 10 minutes.

Next 2 ml. of a 0.5% alcoholic solution of potassium fluoride is added followed by 5 ml. of a buffer solution of pH 4.1 and the solution is diluted to 25 ml. with alcohol. The color intensity of the solution and of a blank is determined in a Meunier electrophotometer and the tocopherol content is calculated.

Another outlet for vegetable oils from American farms. E. M. Deck (Mrs. Tucker's Foods, Inc., Sherman, Texas). *Oil Mill Gaz.* 57(10), 70-72(1953). The use of hydrogenated cottonseed and soybean oils in Mellorines (frozen desserts) is discussed.

Storing crude cottonseed oil. H. L. Tamborini (Calif. Cotton Oil Corp., Los Angeles, Calif.). *Oil Mill Gaz.* 57(10), 41-2(1953). A brief discussion is given of the changes which occur in cottonseed oil on storage.

Economic comparison of three cottonseed solvent extraction processes. K. McCubbin and K. W. Becker (Blaw-Knox Co.). *Oil Mill Gaz.* 58(1), 31-33(1953). The economics of cottonseed extraction in a prepress extraction plant, direct extraction plant and filtration-extraction plant are compared. In the case where there is an existing screw press or hydraulic press plant, conversion to prepress extraction process is generally most profitable.

The oxidation of monoethenoid fatty acids and esters. The preparation and catalytic oxidation of highly purified brassidic acid by gaseous oxygen. J. H. Skellon and C. G. Taylor (Acton Tech. College, Acton, W. 3). *J. Chem. Soc.* 1953, 1433-5. Processes are described for the preparation of highly purified brassidic acid, from the fatty acids of rape oil, via urea complexes. A study of the changes during oxidation of brassidic acid by gaseous oxygen at 120° and 73° in the presence of uranyl brassidate has shown there is little rupture of the carbon chain, the main products being dihydroxybehenic acid and an oily monomeric complex containing keto-hydroxy or keto-unsaturated derivatives. Brassidic acid hydroperoxide is more stable than that of erucic acid, at moderate temperatures, and the trans-acid is less susceptible to oxidation than the cis-isomer.

PATENTS

Refining of glyceride oils. B. Clayton. *U. S.* 2,641,603. In a process for the alkali refining of oil, the oil is mixed at temperatures no higher than 110° F. with a quantity of caustic soda (25-50° Bé) sufficient to neutralize free fatty acids. An aqueous solution of soda ash (10-20° Bé) is then added in an amount such that soapstock can be removed by centrifuging at 100-160° F. The oil is finally mixed with 0.5-4% by weight of caustic soda (20-50 Bé) and centrifuged at 120-180° F. to complete removal of soapstock.

Buffing compound for metals and method of making same. H. A. Stier (E. E. Seeley Co.). *U. S.* 2,642,348. A metal polishing composition is prepared by mixing together 65-85 parts by weight of finely powdered Vienna lime and 15-35 parts of molten triglycerides such as palmitin, stearin, olein and myristin containing 3-10% free fatty acids. The mixture is poured into molds, cooled, and then exposed to a moist atmosphere until a very thin moisture-impervious skin coat of insoluble soaps has formed.

Winterized vegetable oil and process of producing same. A. L. Ayers and C. R. Scott (Phillips Petroleum Co.). *U. S.* 2,643,260. Linoleic acid dimer is added to stabilize the winterized oil.

Phosphorus-containing lubricating oil additives. A. H. Matuszak and C. A. Weisel (Standard Oil Development Co.). *U. S.* 2,643,261. The phosphorus-containing ester is prepared by reacting pentaerythritol monooleate and a C₁₇-C₂₀ monohydric aliphatic alcohol at temperatures below reflux with POCl₃, PCl₅ or PSCl₃ in the presence of pyridine and an inert solvent.

Refining of vegetable and animal oils. D. W. Dron and F. A. Lindsey, Jr. (The De Laval Separator Co.). *U. S.* 2,644,004. In the process of refining oil, a small quantity of strong cold lye is added to the oil and mixed at 70-90° F. until reaction of the lye with color bodies is completed. Water is added, the mixture is heated rapidly to the optimum temperature for centrifugation, and the oil is separated from precipitated impurities and water by centrifuging.

Process for the reduction of fatty esters. J. Blinka and H. J. Peddicord (The Procter and Gamble Co.). *U. S.* 2,647,932. Fatty alcohols are produced by reducing esters of C₁₄ to C₂₂ fatty acids with an equivalent amount of an alkali metal (sodium) and a lower alcohol in an inert solvent which is substantially insoluble in H₂O. Emulsion formation when the reaction is quenched with water is minimized by adjusting the ratio of alcohol and inert solvent to a value greater than 1.7/1. The aqueous phase is separated from the non-aqueous phase and the alcohol is obtained by removal of the solvent.

Stabilization of fats and oils. B. W. Beadle and H. R. Kraybill (to A. W. Brickman, V. Conquest, F. J. Madden, W. B. Oleson and E. T. Filbey, trustees for American Meat Institute Foundation). *U. S. 2,648,608*. The antioxidant consists of a mixture of 10 to 20 parts by weight of a tertiary butylated hydroquinone monoalkyl ether, 2 to 5 parts propyl gallate and 2 to 5 parts of an acid such as citric acid, ascorbic acid, oxalic acid, phosphoric acid, ethyl acid phosphate or triethyl phosphate.

Process for the production of esters of cyclic acetals. J. D. Brandner (Atlas Powder Co.). *U. S. 2,648,680*. Higher fatty acid ester of hydroxyl bearing cyclic acetal is prepared by reaction of the acetal with the fatty acid in the presence of alkaline catalyst.

Hair lotion. Michele Valparaiso. *Ital. 467,951*, Dec. 28, 1951. A typical composition is as follows: anthrason 15, salicylic acid 5, resorcinol 6, 90% EtOH 200, CHCl₃ 30, castor oil 15 g., and lavender. Euresol 10 g. may partially replace salicylic acid and resorcinol. (*Chem. Abs.* 47, 7170)

• Biology and Nutrition

F. A. Kummerow, Abstractor

The composition of the adult human body as determined by chemical analysis. R. M. Forbes, A. R. Cooper, and H. H. Mitchell (Univ. of Illinois). *J. Biol. Chem.*, 203, 359 (1953). The chemical composition of the body of a normal adult human, 46 years of age, is reported. The whole body contained 19.44% ether extract, 55.13% moisture, 18.62% protein (N × 6.25), 5.43% ash, 1.907% calcium, and 0.925% phosphorus. Analyses are reported on 13 separate tissues and organs and are summed to give the above data. Comparisons are made with similar data reported previously.

Infra-red spectra of some lipoproteins and related lipides. N. K. Freeman, F. T. Lindgren, Yook C. Ng and A. V. Nichols (Univ. of California). *J. Biol. Chem.*, 203, 293 (1953). It was suggested that in a lipoprotein spectrum the relative intensities of the ester carbonyl band and certain strong bands of proteins could serve as a rough gage of the lipide-protein ratio, employing ultra-centrifugally isolated serum lipoproteins and related lipides.

Skin sterols. III. Sterol structure and the Liebermann-Burchard reaction. D. R. Idler and C. A. Baumann (Univ. of Wisconsin). *J. Biol. Chem.*, 203, 389 (1953). A series of sterols was treated with the modified Schoenheimer-Sperry reagent, Δ^7 -cholestenol was found to be the most active of the mono-unsaturated sterols, both in the speed of the reaction and the intensity of the color formed. The $\Delta^{8(9)}$, $\Delta^{8(10)}$, and $\Delta^{14(6)}$ -cholestenols were intermediate in speed and intensity, while cholesterol (Δ^5) reacted more slowly. Δ^8 -cholestenol was the least active of the sterols. Sterols substituted at position 7 were fast acting in the color test when the substituent permitted the ready formation of a 7(8) double bond. Compounds not readily converted to a $\Delta^{7(6)}$ -unsaturated sterol were either poorly reactive in the color test or inactive. The sitosterols were slightly less reactive than the corresponding compounds of the cholesterol series.

Lipid and lipoprotein constituents of egg yolk in the resistance and storage of bull spermatozoa. R. F. Kampschmidt, D. T. Mayer, and H. A. Herman. *J. Dairy Science* 36, 733 (1953). The lipid portion of a lipid-protein complex which occurred in egg yolk, and which could be extracted in rather pure form, was shown to protect the spermatozoa from temperature shock. This lipid portion consisted mainly of the phospholipids, lecithin, and cephalin, and these phospholipids obtained from a variety of sources were effective in protecting bull spermatozoa from cold shock. The protection from temperature shock, in the presence of phospholipids, was more satisfactory in citrate or phosphate solutions than it was in solutions of non-electrolytes such as glucose.

The relationship of coenzyme A to lipide synthesis. I. Experiments with yeast. H. P. Klein and F. Lipmann (Harvard Medical School). *J. Biol. Chem.* 203, 95 (1953). A parallelism between CoA levels and the capacity to synthesize ergosterol as well as total lipide was shown by experiments with living yeast. Pantothenic acid-deficient CoA-low and reconstituted CoA-high resting yeast samples were used.

The relationship of coenzyme A to lipide synthesis. II. Experiments with rat liver. H. P. Klein and F. Lipmann (Har-

vard Medical School). *J. Biol. Chem.* 203, 101 (1953). A parallelism was found between CoA levels and the synthesis of cholesterol as well as of total lipide in the liver of pantothenic acid-deficient rats. A depression of steroid and fatty acid synthesis was observed in normal liver slices in the presence of the antimetabolite pantooyltauryl-p-anisidide. This interference appears to depend on a relatively low content in CoA. A partial reversal could be obtained by pantethine, but not with pantothenic acid.

The extracellular lipases of some gram-negative non-sporeforming rod-shaped bacteria. S. A. Nashif and F. E. Nelson. *J. Dairy Science* 36, 698 (1953). It was shown that the extracellular lipase activity of two strains of *Pseudomonas fluorescens* remained at a high level of activity subsequent to pasteurization at 71.6° C. for 30 minutes, indicating they could cause deterioration during holding of the cream or butter made therefrom. Lower levels of post-pasteurization lipase activity were found with several other cultures.

Transitory increase in fat content and size of liver induced by insulin in alloxan-diabetic rats. M. J. Osborn, J. M. Felts and I. L. Chaikoff (Univ. of California). *J. Biol. Chem.*, 203, 173 (1953). The influence of insulin on the size, fat, carbohydrate and protein content of the liver, and hepatic lipogenesis, as measured by the rate of incorporation of the C¹⁴ of pyruvate increase the fatty acid content of the liver of the alloxan-diabetic rats. It was shown that repeated insulin injections can increase the fatty acid content of the liver of the alloxandabetic rats. The insulin-induced fatty liver was, however, transitory.

Nutritional factors in the metabolism of fat. *Nutrition Reviews* 11, 216 (1953). The importance of atherosclerosis has directed great emphasis toward the investigation of lipid metabolism and the relation of nutrition to abnormalities of metabolism. The data failed to demonstrate a specific metabolic defect in the synthesis of fat or cholesterol from labeled acetate in deficiency of pantothenic acid, biotin, choline, or thiamine.

The influence of rapeseed oil on adrenal cholesterol. *Nutrition Reviews* 11, 222 (1953). The increase in adrenal size and cholesterol which follows rapeseed feeding was not attributable to the goitrogenic factor, but to erucic acid which is also a constituent of rapeseed oil. The mechanism whereby erucic acid brings about adrenal cholesterol deposition remains to be discovered.

Some nutritional requirements for biosynthesis of riboflavin by *Ermenthodium ashbyii*. R. J. Hickey (Commercial Solvents Corp.). *J. Bacteriology* 66, 27-33 (1953). A study was made of the factors influencing riboflavin production by *E. ashbyii* on media containing adequate amounts of biotin, thiamin and i-inositol. Sodium glutamate, sodium oleate, yeast extract, Labco vitamin-free casein and gliadin stimulate riboflavin production. Other amino acids and proteins do not, and zein and gelatin may have depressing action. Two unidentified nutritional factors are indicated: one (A) associated with oleic acid, some of its derivatives and yeast extract; the other (B) associated with gliadin and certain casein preparations. Conditions are described which allow the formation of over 1,000 μ g of riboflavin per ml. by *E. ashbyii* in 4 to 5 days in submerged culture.

Effect of crystalline trypsin on the raw soybean growth inhibitor. H. J. Almquist and J. B. Merritt (Grange Co., Modesto, Calif.). *Proc. Soc. Exp. Biol. Med.* 83, 269 (1953). Chicks fed a diet containing 20% raw soybean protein plus 0.3% methionine and 0.05% crystalline trypsin showed distinct weight gains over those fed the same diet with trypsin omitted.

Investigation of herring-meal quality after drying by different methods. L. Aure, K. Bakken, and J. W. Jebsen. *Fiskeriðirektoratets Skrifter Ser. Teknol. Undersokelser* 2, No. 8, 16 pp. (1952). The influence of flame, hot-air, steam, and vacuum driers upon the quality of the meal produced from herring press cake was studied. (*Chem. Abs.* 47, 6569-70)

Effect of moisture on the activity of oat lipase in the olive oil substrate system. G. S. Bains and D. S. Bhatia (Central Food Technol. Research Inst., Mysore). *Science and Culture* (India) 18, 387-8 (1953). The determination of free fatty acids by direct titration from a mixture of enzyme (lipase) and olive oil substrate showed that low quantities of H₂O (0.03 to 0.05 ml./0.1 g. enzyme material) in the substrate were essential for maximum activity. (*Chem. Abs.* 47, 7238)

Biological oxidation of fatty acids containing a triple bond. Karl Bernhard and Urs Gloor. *Helv. Chim. Acta* 36, 296-9 (1953) (in German). After feeding of deuterium-labeled ste-

arolic acid, stearoyl alcohol, behenic acid and undecynoic acid to dogs, labeled azelaic acid was isolated from the urine, proving the biological splitting of the triple bond of the fatty acid. (*Chem. Abs.* 47, 7055)

The site of nitrogen absorption in rats fed autoclaved or raw soybean-oil meal. Raymond Borchers (Univ. of Nebraska, Lincoln). *Science* 117, 482(1953). The apparent digestibility of raw soybean N was not significantly different from the apparent digestibility of autoclaved soybean N when determined by the Cr_2O_3 index method in the terminal 20% of the small intestine of the rat. (*Chem. Abs.* 47, 7071)

Metabolism of lipides. VI. Mechanism of intestinal fat absorption. 4. Bengt Borgström (Univ. Lund, Sweden). *Acta Physiol. Scand.* 25, 291-314(1952). Carboxyl-labeled palmitic acid was used in these experiments. The results are somewhat complicated by the somewhat slower emptying rate of the stomach for free fatty acids than for the corresponding glycerides. The recoveries of absorbed activity and fat in the intestinal lymph are about the same whether corn oil or free fatty acids from corn oil are fed, but the rate of appearance of lymph fat is slower and more prolonged after absorption of free fatty acids. The free active fatty acids appear in the lymph chiefly as glycerides. The lymph phospholipides increase during fat absorption, but these are derived partly from the plasma phospholipides.

VII. Incorporation of saturated fatty acids of different chain lengths in phospholipides of small intestine and lymph of the rat during fat absorption. *Ibid.* 315-21. Saturated fatty acids of different chain lengths are incorporated differently into phospholipides of the small intestine and liver, and into intestinal lymph phospholipides during fat absorption in the rat. Experiments were performed in which saturated fatty acids of different chain lengths (14-18 C) with C^{14} in the carboxyl were incorporated into triolein, and the phospholipides of the small intestine and intestinal lymph during fat absorption were studied. The acid with the longest C chain was incorporated to the largest extent while that with the shortest chain was found in the smallest amount. The same was found in the lymph phospholipides; this is interpreted to indicate that the lymph phospholipides are derived largely from intestinal phospholipides. (*Chem. Abs.* 47, 7065-6)

Occurrence of vitamin E in cod and other fish-liver oils. Fred Brown (Hannah Dairy Research Inst., Kirkhill, Ayr, Scotland). *Nature* 171, 790-1(1953). The presence of α -tocopherol in the nonsaponifiable fraction of liver oils of cod, angler fish, blue skate, haddock, ling, and turbot was confirmed by chromatography on petrolatum- or silicone-treated paper, 75% EtOH or 90% HOAc used as developing solvent. (*Chem. Abs.* 47, 7163)

Fate of free glycerol and glycerophosphate during absorption of fats. M. Buensod, P. Favarger, and R. A. Collet (Univ. Geneva, Switzerland). *Helv. Physiol. et Pharmacol. Acta* 11, 45-8 (1953) (in French). Glycerol and glycerophosphate, labeled with deuterium (D), were fed to rats together with fats or free fat acids. Three hours later the D concentration was measured in the glycerides and phospholipides of the intestine wall. Neither free glycerol nor glycerophosphate is a significant precursor of the lipides in the intestine. (*Chem. Abs.* 47, 7057).

Abortion caused by rancid fat: reabsorption of the fetus caused by avitaminosis E. G. Curto (Univ. Milan). *Acta Vitaminol.* 6, 241-6(1952). In female rats maintained for at least 3 months on vitamin E-free diets, pregnancy terminates by resorption of the fetus. In rats fed diets with a normal tocopherol content but containing 20% highly rancid fat, for at least 50 days, pregnancy usually ends in abortion around the 16th day. Abortion is preceded by interruption of fetal development. The addition of highly rancid fats to the diet, a procedure which favors oxidation of tocopherol, has effects different from direct vitamin E deficiency. (*Chem. Abs.* 47, 7047)

Chemistry of bone marrow. VII. Composition of rabbit bone marrow in experimental hemolytic anemia. Albert A. Dietz and Bernhard Steinberg (Toledo Hospital Inst. of Med. Research, Toledo, O.). *Arch. Biochem. Biophys.* 45, 1-9(1953). Bone marrow of rabbits made anemic by injection of acetylphenylhydrazine for 32-32 days contained only 1.3-5.6% lipide, while the marrow of normal rabbits contained 23-55% lipide.

VIII. Composition of rabbit bone marrow in inanition. *Ibid.* 10-20. Bone marrow of rabbits kept without food for 25 days contained 5% lipide. Most of the lipide originally

present in the marrow had been replaced by a gelatinous substance.

The lipide peroxides formed in the skin by the action of physical agents. P. Dubouloz and J. Dumas (Univ. Marseille, France). *Compt. rend. soc. biol.* 146, 1350-1(1952). Methods are discussed for the extraction of lipide peroxides previously described in *Chem. Abs.* 45, 3433. (*Chem. Abs.* 47, 7012)

Lipides and cholesterol in new-born rats. Zdeněk Dvorák (Masaryk State Radiotherap. Inst., Brno). *Nature* 171, 432-3(1953). The amount of total lipides increased more quickly with increase in weight in blind rats than in rats whose eyes had opened. (*Chem. Abs.* 47, 7071)

Experiments with Swedish rapeseed meal fed to growing chicks and laying hens. Allan Frölich. *Kgl. Lantbrukshögskolans Ann.* 19, 205-8(1952) (in English). More than 5% of rapeseed meal in the diet depressed the rate of growth of chicks, but not so markedly if the meal had been treated with EtOH. It is indicated that even small amounts of rapeseed meal may have an adverse effect on egg production. The weight of the thyroid glands of the experimental birds were greater (346 for 15% rapeseed meal in the ration vs. 62 mg. in the controls). (*Chem. Abs.* 47, 7046)

Microbiological syntheses of fats and lipides. I. The influence of organic substances and plasma poisons on the synthesis of fats and lipides by yeast cells. Roland Kunze (Tech. Hochschule, Graz, Austria). *Mitt. Versuchsanstalt Gärungsgewerbe u. Insts. angew. Mikrobiol. Hochschule Bodenkult.* 4, 44-51 (1950). Yeast strains with various nutritive agents were subjected to the action of organic substances (phenols, ketones, esters, etc.) and the alteration in the synthesis of fats and lipides studied.

II. The importance of external factors on the increase of fat and lipides of under-fermented yeasts. *Ibid.* 5, 129-35(1951). The importance and influence of external factors on the synthesis of fats and lipides by different strains of brewery yeast are discussed. In particular, the influences of nutrients, of the pH, of temperature, and of air of high and low O content are discussed. The maximum of fat and other lipide formation occurs in a neutral pH medium, at 24-28°. Treatment of the cultures with O-EtOH mixtures showed no increase as compared with syntheses in air. 23 references. (*Chem. Abs.* 47, 7024)

The lipolytic enzymes of raw skim milk and separator slime. Harvard G. Nelson (Univ. of Minnesota, Minneapolis). *Univ. Microfilms* (Ann Arbor, Mich.) Publ. No. 4869, 152 pp.(1953). (*Chem. Abs.* 47, 7129)

Nutritional factors influencing growth and lipase production by *Geotrichum candidum*. W. O. Nelson (Univ. of Illinois, Urbana). *J. Dairy Sci.* 36, 143-51(1953). Conditions which gave rise to rapid and extensive growth were generally associated with low lipase production. This effect was produced by various carbohydrates, fats, organic acids, fatty acids, and nitrogenous compounds. Water-soluble vitamins did not influence growth and lipase production. Maximum growth and lipase production in buffered carbohydrate-free media occurred at pH 5.35 to pH 5.85. Maximum lipase production in glycerol medium occurred at pH 6.70 to pH 6.85. (*Chem. Abs.* 47, 6492)

Interrelationships of fecal, body, and dietary fats—a study of fat excretion and fat deposition in rats using simple triglycerides as dietary fat. Leonard N. Norcia (Univ. of Minnesota, Minneapolis). *Univ. Microfilms* (Ann Arbor, Mich.) Pub. No. 4870, 133 pp. (*Chem. Abs.* 47, 7052)

The lipids of fish. 3. The acetone-insoluble fraction of an acetone extract of the flesh of haddock. June Olley and J. A. Lovren (Torrey Research Sta., Aberdeen, Scotland). *Biochem. J.* 54, 559-69(1953). Fractionation of lipides present in a crude acetone extract of haddock flesh gave a fraction C (cf. *Ibid.* 54, 126, 128), practically insoluble in acetone at 0°, which was fractionated by counter-current distribution between petroleum ether and 85% EtOH. The total acetone extract and fraction C contained, resp., (%): lecithins 39.12, 37.9; unidentified lipides (contains higher ratio of fatty acids to phosphorus than any known glycerophosphatide) 12.5, 20.5; phosphatidyl ethanolamine 4.7, 9.4; waxes and alcohols 6.3, 5.0; hydrocarbons 1.3, 1.1; plasmalogens 0.9, 0.9; cholesterol 6.4,; cholesteryl esters 3.5,; free fatty acids 6.3,; non-lipides 16.5, 25.2. Fatty acid compositions are reported for 4 lecithins and 2 unidentified lipides.

Nutritive value of oleic acids. S. S. Phatak and V. N. Patwardhan (Indian Council Med. Research, Coonor). *J. Sci.*

Ind. Research (India) 11B, 533-7(1952). The difference in digestibility, 91% for isooleic acids vs. 93.5% for oleic acid, is not significant. Approximately 94% of absorbed isooleic acid is metabolized, approximately 6% found in carcass fat. Mixed isooleic acids from partially hydrogenated peanut oil, (vanaspati) containing 29% isooleic acids were fed 8 rats for 8 weeks while the control group received oleic acid. The experiment was run twice with isooleic acids separated by Pb salt precipitation and subsequent fractionation of brominated Me ester salts, and again with isooleic acid prepared by a less drastic Hg salt precipitation. Markedly better growth of rats fed isooleic prepared by the fractionation method over those fed isooleic acids prepared by Hg salt precipitation is attributed to new compounds formed during the former, more drastic separation. (*Chem. Abs.* 47, 7050)

Successful prevention of experimental hypcholesteremia and cholesterol atherosclerosis in the rabbit. O. J. Pollak (Quincy City Hosp., Quincy, Mass.). *Circulation* 7, 696-701(1953). The view that rabbits do not absorb sitosterol was confirmed. Cholesterol and sitosterol form inseparable crystals, and when the 2 sterols were fed simultaneously to rabbits, cholesterol was absorbed incompletely or not at all. The effect of varying ratios of the 2 sterols was discussed. (*Chem. Abs.* 47, 7064)

Cholesterol esterase of adipose tissue: its sensitivity to hormone action. Odette Schoelly and P. Favarger (Univ. Geneva, Switzerland). *Helv. Chim. Acta* 36, 90-101(1953) (in French). Cholesterol esterase of adipose tissue possesses optimum activity at pH 7.5-7.6, is activated by bile salts, hydrolyzes synthetic cholesteryl oleate and is insoluble in fat solvents. Adipose tissue of animals given anterior pituitary extract favors esterification of cholesterol and not hydrolysis of its fatty acid esters. *In vitro*, effects of anterior pituitary extracts were similar. Insulin suppresses the action of the pituitary preparation. (*Chem. Abs.* 47, 7055)

Effects of ferric chloride and bile on plasma cholesterol and atherosclerosis in the cholesterol-fed bird. M. D. Siperstein, C. W. Nichols, Jr., and I. L. Chaikoff (Univ. of California, Berkeley). *Science* 117, 386-9(1953). The rise in plasma cholesterol resulting from cholesterol feeding can be prevented by feeding FeCl₃. Other effects of FeCl₃ on the White Leghorn cockerels are discussed. (*Chem. Abs.* 47, 7046)

A general method for the preparation of cerebrosides. L. Lahut Uzman (Harvard Med. School). *Arch. Biochem. Biophys.* 45, 149-55(1953). Tissue was extracted with hot CHCl₃-MeOH(2:1) and the cerebrosides isolated at the interphase zone when dilute Cl₃CCOOH was added to the lipide extract. Composition and IR spectra are given for cerebrosides isolated from cattle brains and from human spleens affected with Gaucher's disease.

Fatty acid oxidation in malignant and normal livers. N. Waterman, C. J. Bos, and T. J. Barendregt (Netherlands Cancer Inst., Amsterdam). *Enzymologia* 15, 307-12(1952) (in English). Feeding of carcinogenic azo dyes (*o*-aminoazotoluene to mice or *p*-dimethylaminoazobenzene to rats) stops fatty acid oxidation in the liver. Capacity to oxidize caprylic acid is lost before capacity to oxidize caproic acid. Monobasic fatty acids above C₆ (pelargonic, capric, undecylenic, undecylic, lauric, myristic, ricinoleic, and oleic acids) as well as saturated dicarboxylic acids above C₈ and maleic, mesaconic, and itaconic acids inhibit fatty acid oxidation. Fumaric, succinic, and α -hydroxycaproic acid enhance it. The latter even restores the capacity of the livers damaged by azo dye feeding to oxidize the fatty acids. (*Chem. Abs.* 47, 7081-2)

PATENTS

Protected enzyme preparation. R. A. Gale and J. T. Haigh (Pillsbury Mills, Inc.). *U. S.* 2,642,376. A preparation of Amylase consists of the enzyme carried in an oily vehicle such as sesame oil, deodorized and refined kerosene, coal oil, pine oil or soya oil which protects the enzyme from contact with H₂O. Lecithin and fatty acid esters of hexitol anhydrides having polyoxyethylene groups are added as dispersing agents. The enzyme and oily vehicle are enveloped in a film of material such as gelatin, cellulose and polyvinyl alcohol which will dissolve in water about 10° below the gelation temperature of the starch that is to be treated with the enzyme.

Packaged popcorn kernels and popping oil. J. T. Martin (Rose Kist Foods, Inc.). *U. S.* 2,648,610. The food package consists of a container filled with popcorn kernels and sufficient popping oil to fill the voids and allow kernels and oil to be simultaneously poured from the container as a cohesive flowable mass.

• Drying Oils

Raymond Paschke, Abstractor

Loss of drying power of paints during storage. Causes and proposed remedies. Mme. F. Appell. *Peintures, pigments, vernis* 29, 122-4(1953). A review. (*Chem. Abs.* 47, 7230)

A listing of paints and varnishes in Great Britain. Part I. F. Armitage. *Paint Manuf.* 23, 190(1953). Discussion of raw materials of paint and the craft of painting from the earliest times up to the Anglo-Saxon period.

Oxidation of oils and fats. C. E. H. Bawn. *Nature* 171, 1057(1953). Discussion of a symposium on "oxidation" by the Oils and Fats Group of the Society of Chemical Industry. Discussed are (1) C. E. H. Bawn's review of fundamental ideas on mechanism and the effect of catalysts, (2) C. H. Lea's review of oxidational deterioration of edible lipoids, (3) Baul's description of the autoxidation of linoleic acid, (4) Skellon's review of oxidation of monoethenoids catalyzed by metallic soaps (uranium, thorium, vanadium, etc.) and (5) O'Neill's summary of the studies of the drying of oil films and manufacture of blown oils and linoleum gels.

The testing of finishing insulating varnishes. H. W. Chatfield. *Paint Manuf.* 23, 181(1953). Practical instructions for testing finishing insulating varnishes of the air-drying spirit, air-drying oleo-resinous, and stoving types.

Thermal polymerization of methyl beta-eleostearate. A. L. Clingman, D. E. A. Rivett, and D. A. Sutton. *Chemistry and Industry* 1953, 798. The dimer is shown to contain a six-carbon ring by a bromination with N-bromosuccinimide followed by dehydrobromination and oxidation to give prehnitic acid (benzene 1,2,3,4-tetracarboxylic acid).

Masonry coatings—types and uses. Anthony Figliolino. *Paint Varnish Production* 43, No. 8, 31(1953). A thorough review of masonry coatings. Discussed are cement manufacture, its composition, the causes of masonry coating failures, and reasons for painting masonry. Three general types of coatings are described. (1) Inorganic types include cementitious and silicate coatings. (2) Organic types include the rubber based coatings with excellent water and alkali resistance and the oil based type which are suitable only when a wall is aged and dry. The transparent types include aluminum stearate and the silicones.

Polyurethanes in varnish. *Paint Oil Chem. Rev.* 116, No. 16, 34(1953). A 300-word abstract of a paper on the European use of polyisocyanates by F. Hebermehl, *Bull. Swiss Paint Varnish Chemists*, No. 21, March, 1953.

Wrinkle finishes from tobacco-seed alkyds. S. L. Kapur and R. M. Joshi. *Paint Manuf.* 23, 185(1953). A description of experiments conducted to establish the conditions necessary for producing a satisfactory wrinkle finish from tobacco-seed oil-modified alkyds. Comments are made on the mechanism of wrinkling.

Application and formulation problems in wood finishing. B. M. Letsky. *Paint Varnish Production* 43, No. 8, 28(1953). Discussed are the essentials of good wood finishing, the use of stains, fillers, and sealers, the drying methods employed, the types of finishing coats, and the formulation of finishing lacquers.

Solvents, thinners, and additives. Sidney B. Levinson. *Am. Paint J.* 37, No. 46, 28(1953). A complete discussion. This is Lecture VII in the Third Ten-Year Practical Paint Course sponsored by the New England Production Club.

Some problems of paint specification testing. R. M. C. Logan. *Oil & Colour Chemists' Assoc. J.* 36, 373(1953). The following are discussed: consistency, coarseness, odor, covering power, skinning, drying time, film thickness, bend tests, the Erichsen test, accelerated aging and accelerated weathering.

Manufacture of tung oil stand oils. J. van Loon. *Verfkronek* 26, 61(1953). If the α -eleostearic acid in tung oil is isomerized to β -eleostearic acid a higher proportion of polymeric acids can be formed before gelation. Oil isomerized with iodine could be polymerized at 170° C. to give a polymer with a polymeric acid content as high as that obtained from the original oil by polymerization at 280° C.

Preparation of metallic soap solutions. George Marwedel. *Paint, Oil & Color J.* 124, 150(1953). A discussion of the preparation of driers.

Component fatty acids of the drying oil from the seeds of *Trichosanthes dioica*. H. H. Mathur and J. S. Aggarwal. *J. Sci. Ind. Research (India)* 12B, 60-2(1953). The seeds yield

on extraction with petroleum ether 29.3% of a dark reddish green oil having the following consts.: n_D^{20} 1.5009 acid no. 0.61, sapon. no. 196.6, unsaponifiable 1.643%, I no. (Wijs 30 min.) 128.2, I no. (Woburn B) 152.6, diene no. (Ellis-Jones) 26.69. The component fatty acids are triene conjugated (α -eleostearic or trichosanic) 27.80, linoleic 33.36, oleic 27.10 and saturated acids 11.74%. (*Chem. Abs.* 47, 7791)

Application of fatty acids and alkyds. W. L. Riegler. *Paint Varnish Production* 43, 26 (1953). A discussion of fatty acids, their types, properties, manufacture, packaging, selection, and application in alkyds.

Radiochemistry in paint research. D. F. Rushman. *Oil & Colour Chemists' Assoc. J.* 36, 352 (1953). The principles underlying the application of radioactive isotopes as tracers are outlined and techniques associated with their use described. Examples of their use and necessary precautions are given. Applications include examination of paint/substrate interfaces and leaching during weathering. Analytical applications include determination of potassium in pigments, analysis of complex mixtures by isotope dilution and location of fatty acids in a chromatogram. Examples are given of the use of radioactively labeled catalyst for following the dehydration of castor oil and the use of C^{14} in following ester interchange reactions.

Industrial hazards of chemicals and flammable solvents. D. C. Sayles. *Off. Dig. Federation Paint & Varnish Production Clubs* 343, 451 (1953). Short discussion.

Structure of methyl linoleate peroxides. H. H. Sephton and D. A. Sutton. *Chemistry and Industry* No. 27, 667 (1953). Peroxide concentrates were obtained from partially autoxidized methyl linoleate prepared at 4° in the dark and 23° in diffused daylight. The Craig counter-current extraction procedure was used to separate unchanged linoleate and highly oxidized material. These concentrates were reduced with sodium borohydride to the corresponding hydroxy-esters. The presence of cis-trans and trans-trans conjugated isomers was indicated. The 11-isomer was entirely absent or present in very small amounts.

Fundamentals of paint, varnish, and lacquer technology, Chapter V—Driers. Elias Singer. *Am. Paint J.* 37, No. 47, 62 (1953). A discussion of driers, their properties, their action, and typical drier combinations.

Quick methods of making linoxyn and linoleum. P. Slansky. *Paint Manuf.* 23, 193 (1953). A number of experiments to find means of shortening the time need for the manufacture of linoxyn (solid oxidized linseed oil) and linoleum. This involved mastication of blown linseed oil and oxidation of linseed oil previously emulsified.

The thermal decomposition of methyl linoleate hydroperoxide. L. Williamson. *J. Appl. Chem.* 3, 301 (1953). On decomposition of the peroxide, more than half of the peroxide oxygen appears in the monomeric fraction. The polymer yield is approximately equal to the amount of peroxide originally present. Approximately half of the polymer is dimer containing none of the original peroxidic oxygen. The remaining polymer is 42% dimer and 58% residual trimer, both containing extra oxygen.

Some common questions about equipment for vehicle manufacture. Stanley Yokell. *Paint Varnish Production* 43, No. 8, 25 (1953).

The effect of driers on the properties of alkyd resin finishes. 3. Gas-checking and wrinkling problems. Anon. *Paint Manuf.* 23, 220 (1953). Defect develops most often in industrial districts in the winter and is believed to be due to oxides of nitrogen. It is more serious in industrial stoving finishes than in air drying decorative finishes. A discussion with photographs.

Resinous polyhydric alcohols—a staff report. *Paint Oil Chem. Rev.* 116, No. 17, 24 (1953). A description of the chemistry and technology of a group of highly functional alcohols. Discussed are (1) polyvinyl alcohol, its esterification directly or by ester interchange, and the polymerization of its esters, (2) polyallyl alcohol and its esters, (3) epoxy resins and their esters, (4) phenolic resins, (5) resinous polyglycerols and (6) amino-containing resinous alcohols.

Inert atmospheres in the manufacture of alkyd resins. Anon. *Paint Varnish Production* 43, No. 8, 21 (1953). Use of a 4000 c.f.h. generator is described.

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Oxidation-reduction systems and induction period of polymerizations occurring in the presence of oxygen. Heinz Trenne. *Ger.* 810,813, Aug. 13, 1951. The induction period and poly-

merization velocity in polymerization processes where a natural oxidation-reduction system is formed in the presence of O can be regulated, because, in the presence of a given catalyst, they are proportional after the reaction is initiated. This regulation is desirable because certain materials, such as acrylic acid and derivatives, have a tendency toward explosive reactions with formation of glyoxylic acid. On the other hand, the reaction of styrene and linseed oil with formation of HCHO is slow even with long induction periods. By graphing the percent O against the polymerization velocity, it was found that reducing acids, peroxides, and peracids cause a strong oxidation-reduction gradient in the presence of even small amounts of O. On the other hand, non-reducing acids, aldehydes, alcohols, and phenolic substances need more O. In order to increase the rate of drying of styrene, for example, the amount of O must be reduced almost to zero by addition of aldehydes or alcohols or by removal of HCOOH. The amount of O may be regulated by mixture with N or other inert gases. The selection of the members of the oxidation-reduction system also influences the properties of the end products. These principles are applied to increasing the viscosity of varnishes from vegetable oils and in prevention of the discoloration and gelation of stand oil. (*Chem. Abs.* 47, 7258)

Organic driers for coating compositions. Charles A. Coffey, Russell T. Ryan, and Lynwood N. Whitehill. *U. S.* 2,631,944. Conventional soaps and salts of Pb or other metals may be replaced by metal-free carbonyl compounds, such as β -methylumbelliferone, p-hydroxybenzaldehyde, or p-hydroxypropionophenone. Data for various other compounds of this type are presented. (*Chem. Abs.* 47, 7794)

Printing ink containing a polymerized olefin. Herman S. Bloch and Alfred E. Hoffman. *U. S.* 2,640,782. Drying oils are formed by the low-temp. HF-catalyzed copolymerization of conjugated diolefins with isoolefins, each aliphatic and with no more than 8 C atoms. Thus, butadiene and isobutylene dissolved in propane are caused to react at -76° to yield an oil which dries in less than 24 hrs. when exposed to air in a thin film to a light-colored, hard, tackfree though brittle film. The oils may partly replace conventional drying oils in printing inks. (*Chem. Abs.* 47, 7794)

Styrene modified alkyds and process of producing the same. Charles J. Meeske. *U. S.* 2,647,092.

Methyl methacrylate-modified oil alkyd. Carl J. Opp and Raymond E. Werner. *U. S.* 2,647,093. Process employs peroxide catalyst and an alkyl mercaptan. Resin is compatible with urea-formaldehyde resins.

Pigment pastes comprising a pigment and a salt of a copolymer of styrene and a maleic half-ester. Frank J. Hahn. *U. S.* 2,647,094.

Alkyd resin. Carl J. Opp and Raymond E. Werner. *U. S.* 2,647,095. Similar to *U. S.* 2,647,093.

Synthetic drying oils. E. O. Phillips, N. W. Hanson, S. G. Horsley, and I.C.I. Ltd. *British* 673,082. A trihydroxy or tetrahydroxy saturated alcohol (e.g., glycerol or pentaerythritol) is heated with a fatty acid of formula R-CH=CH-CH-COOH, where R is an alkyl radical of 1 to 7 atoms, or ester-forming derivative thereof. (*Paint Manuf.* 28, 204 [1953])

Varnishes for coating wires. Leopoldo Michelotti and Giuseppe Parolini. *Ital.* 467,972. Wires, especially for elec. app. are coated with resinous varnishes made by mixing polyamide resins with other condensation resins. (*Chem. Abs.* 47, 7234)

• Waxes

R. L. Broadhead, Abstractor

Sugar cane wax. The effect of chemical modification upon the physical properties. H. H. Hatt and J. A. Lamberton. *Proc. Queensland Soc. Sugar Technol.* 20, 29-41 (1953). Bleached waxes consisting essentially of mixtures of long-chain fatty acids were obtained from crude sugar cane wax by washing it with mineral acids and subsequent oxidation with chromic and sulfuric acids or by similar washing and oxidation followed by the removal of soft components by distilling them under reduced pressure. From both of these acidic waxes, a variety of derived waxes was prepared either by esterifying them with polyhydric alcohols such as ethylene, propylene and trimethylene glycols, glycerol, pentaerythritol and 2,2,6,6-tetramethyloxy-cyclohexanol in the presence of a little para-toluenesulfonic

acid as catalyst or by converting them to amides and diamides by heating with the theoretical amount of the amine or diamine. The methylene and ethylene diamides were very hard waxes and conferred extremely high gloss upon polishes made with them. The pentaerythritol waxes were the hardest of the ester waxes that were prepared. Since the flow point of the solvent pastes prepared from the diamide waxes was too high and that of the pastes from the pentaerythritol esters was too low, blends of the ester and amide waxes were prepared. Polishes made from such mixtures and from solvent refined cane wax are said to equal the performance of those prepared from carnauba wax.

Waxes in cosmetics. Harry Hilfer. *Drug & Cosmetic Ind.* 72, 178-9, 221(1953). Sources and applications are discussed. (*Chem. Abs.* 47, 6609)

Retention number and retention effect. Proposal for a uniform method. L. Ivanovszky. *Fette u. Seifen* 54, 559-62(1952). The retention no. (I) of a wax is defined as the wt. of solvent retained by 133.3 g. of a paste made from 25% wax and 75% ligroine on natural evapn. at 15° by using a metal evapn. dish of 120 mm. diam. and 25 mm. height. The retention effect is defined by the max. I obtained after 10 days and the corresponding max. wax content. Detailed methods are given. (*Chem. Abs.* 47, 6679)

Cleansing as a cosmetic function. Stefan A. Karas. *Am. Perfumer Essent. Oil Rev.* 61, 277-9(1952). Discussion concerning a comparison of cream and soap cleansing, use of creams with polyethylene derivs., beeswax-borax mixts., and detergent-type creams. (*Chem. Abs.* 47, 6609)

The relationship between physical constants and the drying properties of partially conjugated linseed oils. J. D. von Mikusch and K. Mebes. *Farbe und Lack* 59, 223-228, 271-275 (1953). Much of the present-day knowledge of the differences in drying characteristics between conjugated and non-conjugated oils has been based on observations made on linseed, tung, and dehydrated castor oil but such comparisons involve variables in addition to conjugation. Accordingly, a series of samples was withdrawn during a plant run of the catalytic isomerization of linseed oil conducted under such conditions that the degree of conjugation of the oil was increased without changing the amount of unsaturation. The increasing conjugation during the run was characterized by a rise in refractive index, changes in density and viscosity and in particular by the appearance of typical absorption bands in the ultraviolet spectrum. Drying speeds were determined on the samples after the addition of driers. It was observed that as the conjugation increased there was a progressive decrease in the weight gain during drying and the drying time dropped to a fraction of that of the untreated oil. The dependence of bodying time on the initial degree of conjugation was investigated. Water and weather resistance of the films were tested and conjugation was shown to play a prominent role in these factors. From all these results the use of physical measurements for evaluating the practical behavior of drying oils was demonstrated.

Constitution of alfalfa wax. L. Savidan (Inst. hautes etudes, Tunis). *Bull. soc. chim. France* 1953, 320. Alfalfa dust was extd. at 50° with C_6H_6 and $Cl_2C=CHCl$, giving 6-30% wax, m. 70-2°, sapon. no. 71, acid no. 35, Wijs I no. 12, unsaponifiable over 50%. Cold Me_2CO seps. the wax partly into fractions of sapon. nos. 100-150. Sapon. produced phenols and 1/2% butyric acid. (*Chem. Abs.* 47, 7240)

Industrial raw materials of plant origin. II. Recent developments in vegetable waxes, gums, and resins. T. A. Wastler, P. M. Daugherty, and H. H. Sineath. *Georgia Inst. Technol., State Eng. Expt. Sta., Bull.* No. 15, 31 pp. (1953). (*Chem. Abs.* 47, 6679)

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Water-repellent composition. Hans G. Figdor. *U. S.* 2,635,055, Apr. 14, 1953. Textiles can be made water-repellent with a compn. contg. a wax, or waxlike material combined with a multivalent metal salt and stabilized with an anionic surface-active agent. The emulsion used employs anionic and nonionic surface-active agents excluding cationic agents and protein-protective colloids. For example, an emulsion is prepd. from paraffin 20, stearic acid 3, triethanolamine 1.5, and H_2O 55 parts. The emulsion is cooled to room temp. and 20 parts of aluminum acetate soln. (24%) is added with agitation. One part of monolauric acid ester of a polyethylene glycol of an av. mol. wt. of 600 is added with vigorous agitation. This produces a thin, pourable, milky liquid which is stable on storage and easily dil. with H_2O . (*Chem. Abs.* 47, 6670)

Azo dye duplicating process. Robert J. Klimkowski and Robert T. Florence (to A. B. Dick Co.). *U. S.* 2,634,677, Apr. 14, 1953. A carbon type transfer sheet is coated with a mixt. of carnauba wax 8, oxidized microwax (Cardis 262) 11, polybutene (Oronite 128) 3, petrolatum 6, mineral oil (100 sec.) 17, and p-diazodiethylaniline $ZnCl_2$ 55 parts. The mixt. is applied as a hot melt at 80-5° at 15-20 lb./3000 sq. ft. For hectograph duplication, the copy sheet is treated with a soln. of phloroglucinol 0.5, 2-naphthol 5, diethanolamine (I) 2, and MeOH 92.5 parts to give a purple copy; use of phenylmethylpyrazolone 5, I 2, and MeOH 93 parts gives a red copy, while 2,3-(HO)₂-6- $C_{10}H_8SO_3H$ 5, I 8, H_2O 10, and MeOH 77 parts gives a blue copy. p-Diazoethylhydroxyethylaniline, p-diazodimethylaniline, and p-diazodiethyltoluidine $ZnCl_2$ salts can also be used to prep. a transfer sheet. (*Chem. Abs.* 47, 6663)

Dewaxing by the solvent method. Yoshio Tanaka and Satou Sakurai (to Nippon Fats and Oils Co.). *Japan.* 2585('52), July 9. The wax in fatty oil is sepd. by treating with furfural (I), alone or mixed with hydrocarbons or halogenated hydrocarbons sol. in I. (*Chem. Abs.* 47, 6685)

Refining of Japan wax. Takayoshi Wachi. *Japan.* 2679('52), July 18. Japan wax is melted at 60°, treated with a small amt. of oxalic acid, heated to 100°, water added at 60°, and let stand to sep. into a bleached wax layer and an aq. layer. (*Chem. Abs.* 47, 6685)

• Detergents

Lenore Petchaft, Abstractor

Special types of toilet soap. Jacques Bergeron (S. A. Cadum-Palmolive, France). *Soap, Perfumery, Cosmetics* 26, 788-94, 822(1953). Shaving, deodorant, floating and transparent soaps are reviewed. Particular attention is paid to the structure, constitution, formulation and manufacture of the transparent soaps.

The determination of the weight ratios of perfume compositions in soaps. Karl Bergwein (Gragoco, Holzminden, Ger.). *Seifen-Ole-Fette-Wachse.* 78, 489-90(1952). The amount of perfume in soap is determined by dissolving small pieces of soap in 10 vols. of distilled H_2O , extracting the perfume with petroleum ether, evaporating the solvent, and weighing the residue. In the case of soaps containing unsaponifiable or unsaponified material and superfatting agents, the residue is dissolved in a small volume of absolute EtOH, the nonperfume materials are separated by freezing, the alcoholic solution is diluted with H_2O until the perfume oil separates, and the perfume oil is determined by the paraffin-cake method. (*Chem. Abs.* 47, 7166)

Colorimetric determination of EDTA in soaps and detergents. Albert Darbey (Alrose Chemical Co., Providence, R. I.). *Soap, Sanit. Chemicals* 29, No. 8, 81, 83, 85, 153(1953). Details are given for the colorimetric determination of total, combined, and non-combined ethylenediamine tetracetic acid in the analysis of soap and detergent products. The method is based on the fact that nickel will displace calcium, magnesium and other metals from their EDTA complexes. Excess nickel is precipitated with dimethyl glyoxime and removed. The nickel is then liberated from the nickel-EDTA complex on acidification and after reacting with dithiooxalate is determined colorimetrically as red nickel dithiooxalate. The intensity of the red color is proportional to the ethylenediamine tetracetic acid present.

Foaming of surface-active agents. F. Kroemer and G. Ehrhard. *Melliand Textilber.* 34, 127-9(1953). The influence of hardness, pH, and addition of phosphate on the foaming properties of a variety of commercial surface-active agents is investigated. Almost always increased hardness considerably reduces foaming, but decreased pH has little effect. The action of phosphate depends on the type of phosphate, its concentration, and the nature of the surface-active agents; several optima are noted.

A rapid spectrophotometric method for the detection and estimation of hexachlorophene in soap. J. W. Lord, I. A. McAdam and E. B. Jones (J. Bibby & Sons, Ltd., Liverpool, Eng.). *Soap, Perfumery, Cosmetics* 26, 783-7(1953). A rapid and accurate spectrophotometric method is described for the detection and estimation of hexachlorophene in germicidal soaps. This is based on the fact that hexachlorophene in solution in aqueous alkali, exhibits a well-defined maximum at 320 mu. A Beckman spectrophotometer is used so that allowance for irrelevant absorption by the soap can be made with the aid of the Mor-

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ton-Stubbs three-point geometrical correction. The method compares favorably with the colorimetric method.

Soaps from fatty acids. Richard Rowe (Victor Wolf Ltd., Manchester, Eng.). *Perfumery Essent. Oil Record* 44, 244-6 (1953). The advantages of using fatty acids for making soap instead of fats are reviewed. These include use of inferior fat which now can be converted to pure fatty acids, improved and simplified recovery of glycerine from the hydrolysis of the fats rather than from saponification, direct preparation of salts other than the sodium soap, and lowering of costs due to cheaper saponification using soda ash to replace caustic soda.

Lauryl sulfates—their manufacture, qualities and evaluation. L. Schon (Cyclo Chemicals, Ltd., London, Eng.). *Soap, Perfumery, Cosmetics* 26, 676-9, 708 (1953). The manufacture of lauryl sulfates takes place by treating lauryl alcohol under carefully controlled conditions, especially of temperature, with the appropriate quantity of sulfuric acid, oleum, chlorosulfonic acid, sulfur trioxide, etc. During the sulfation process the fatty alcohols present are transformed into the corresponding sulfuric acid esters. The sulfation is followed by neutralization with the desired alkaline agent to form the corresponding salts. The various lauryl sulfate salts such as ammonium, triethanolamine and ethanolamine, in liquid, paste, and powder form are described and methods given for analysis and evaluation in various applications, especially shampoos.

The rate of solution of soaps, especially of oxygen-containing washing powders produced from different fats. Joh. Tum. *Seifen-Ole-Fette-Wachse*. 79, 52-3, 75-6 (1953). A discussion of the relation between the solubility, foam formation, and detergent action of soaps or soap powders. (*Chem. Abs.* 47, 7796)

Glycerol waters and soap crude lyes. F. Widaly. *Seifen-Ole-Fette-Wachse*. 78, 503-7 (1952). A review of the production of glycerol from glycerol waters obtained by the Twitchell process and from soap crude lyes. (*Chem. Abs.* 47, 7240)

The behavior of soaps from synthetic fatty acids during the salting-out process. F. Widaly. *Seifen-Ole-Fette-Wachse*. 79, 79-81 (1953). Salting-out experiments with soaps from synthetic fatty acids (I) show that they require the addition of larger amounts of NaCl (48 parts/100 parts fatty acid) than do soaps from palm-oil fatty acids (24 parts). Analysis of the residual liquor after salting out soaps from 3 fat mixtures (I, 34, 0, 20; coconut-oil fatty acid, 0, 35, 15; palm-oil fatty acids 20; hard-fat fatty acid 10; and tallow-fatty acid, 35%) with the calculated amount of NaCl shows the amount of fatty acids to be highest with I, lowest with coconut-oil fatty acids, and intermediate with mixtures. (*Chem. Abs.* 47, 7796)

Surface-active products. Edward L. Doerr (Monsanto Chemical Co.). *U. S.* 2,637,701. Useful detergent products are prepared by mixing tertiary alkyl mercaptans having from 8 to 16 carbon atoms in the alkyl group with an aliphatic alcohol having from 8 to 16 carbon atoms to produce a mixture which contains at least 1% by weight of the said alcohol, and then condensing the mixture with ethylene oxide to produce a product free of residual mercaptan odor.

Manufacture of odorless soap from low grade oils and fats. Klaus Appuhn (Compania Industrial). *U. S.* 2,640,840. Odorless soap of good quality is produced from malodorous unsaturated fatty acids obtained from low grade animal and vegetable fats and oils by a modification of the Varrentrapp reaction in which sperm oil or wool grease is added to reduce the violence of the reaction in which the long chain unsaturated acids are reduced to shorter chain saturated acids.

Surface-active composition. Jay C. Harris (Monsanto Chemical Co.). *U. S.* 2,642,400. A surface-active composition with synergistic effects resulting in improved wetting speed, greater storage stability and improved detergency is prepared by mixing a compound of the group consisting of the sodium alkylbenzene, alkyltoluene and alkylxylene sulfonate with the condensation product of 1 mole of a tertiary aliphatic mercaptan with from 5 to 20 moles of ethylene oxide.

Thickened aqueous detergent solutions. Frederick Joseph Pollok (Imperial Chemical Industries Ltd.). *U. S.* 2,645,615. An aqueous solution of a soapless detergent of increased viscosity is prepared by thickening a synthetic organic anionic or non-ionic detergent with an alkali metal salt of an acid ester of a partially esterified polyvinyl alcohol in which the vinyl alcohol groups are partly esterified by maleic acid, partly acetylated and partly unreplaced.

Production of surface active sulfates. Wilfred John Oldham and Max Marin Wirth (Anglo-Iranian Oil Co.). *U. S.* 2,645,656. Surface active agents are produced by reacting long chain alkyl hydroperoxides with sulfur dioxide to produce alkyl hydrogen sulfates and converting the said alkyl hydrogen sulfates to alkyl sulfate salts or esters of metals, ammonia, organic bases or other bases.

Making white soap. Frank L. Jackson and John C. Bayer (Procter & Gamble Co.). *U. S.* 2,646,435. White soaps can be made from vegetable fatty matter containing color precursors by hydrogenating the fatty matter, treating it with metal chlorites in the presence of sulfuric acid thereby converting the substantially colorless precursors into colored materials, removing such colored materials by contacting the treated fatty matter with an adsorptive bleaching earth, and saponifying the fatty matter to form soap.