TABLE III

Inositol Analysis

Inositol from	Melting Point	Hydroxyl Content
	°*C.*	%
Flaxseed 1	226	55.4
Flaxseed 2	224	55.7
Stillingia	224	56.1
C. digitata	224	53.2
C. foetidissima	226	53.7
Peanut	223	53.8
Phytin	226	56.8
Inositol	225	56.6

Acknowledgment

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

• Oils and Fats

R. A. Reiners, Abstractor

Simplified procedures for determination of hypochlorous acid value of fatty oils. S. K. Basu (Calcutta Univ.). *Indian Soap J.* **17**, 216-18(1952). HOCl adds quantitatively to the ethylenic bonds of unsaturated fatty acids when these are present in the form of their Na salts. The following method was developed: Saponify 0.1-0.2 g. of the sample in a 250-ml. glass-stoppered conical flask. Neutralize the excess alkali with 0.5 *N* HCl, evaporate the alcohol on a water bath, and add 2 ml. water to dissolve the soap. Then add 5 ml. NaOCl reagent and 10 ml. glacial acetic acid. Stopper immediately, shake well, and keep in the dark for 15 minutes. Add 10 ml. 20% KI solution, allow to stand for 5 minutes in the dark, and titrate the liberated iodine with $Na_2S_2O_3$. Observed and calculated HOCl values were determined for the following fats, respectively: butter 6.7, 6.9; coconut 2.0, 2.0; castor 18.4, 18.4; peanut 18.7, 18.8; mustard 20.5, 21.1; and linseed 38.2, 38.3. (*Chem. Abs.* **46**, 8394)

Dissociation temperatures of urea complexes of long-chain fatty acids, esters and alcohols. H. B. Knight, L. P. Witnauer, J. E. Coleman, W. R. Noble, Jr., and D. Swern (East. Reg. Res. Lab., Philadelphia, Penna.). *Anal. Chem.* **24**, 1331-4 (1952). Dissociation temperatures of urea complexes with 42 long chain compounds (fatty acids, methyl esters, alcohols) have been determined. This temperature is characteristic for each compound and suggested as a method of identification.

Rendering lard at low temperatures. C. E. Swift and O. G. Hankins (Bur. Animal Ind., Beltsville, Md.). *Food Tech.* **6**, 161-5(1952). The yield of lard produced by a modified open-kettle process operated on a pilot plant scale from skin-free fatty tissue averaged 96-98% in cutting and leaf fats, respectively. The highest yields were obtained by rendering tissue which had been cooled to —18°F. and ground through an 0.125-inch plate. Lard rendered at low temperatures (203°F.) had a very light color (2.0 γ, 0.2 R Lovibond) and a less pronounced odor and flavor than ordinary commercial lard. The average stability of the samples was 6 hours AOM.

Clarification of used sunflower oil. A. S. Ivanov. *Rybnoe Khoz.* **25**, No. 3, 16-18(1949); *Chem. Zentr.* **1949**, 1026. Used sunflower oil accumulating in the production of canned fish is subjected to a step-by-step alkali refining. (*Chem. Abs.* **46**, 7795)

Contents of oil and mineral substances in the seeds of yew and fir. A. Nemec (State Research Inst. Forestry Production, Prague). *Sbornik Ceskoslov. Akad. Zemedelske* **24**, 419-21 (1951). The undried seeds of the yew *Taxus baccata* contain 63.5% oil, which is about double the amount in fir seeds. The K content of the yew seed is the highest among the conifers. (*Chem. Abs.* **46**, 7795)

The modification of fish fat during the process of its extraction. R. R. Perepletshik. *Rybnoe Khozyaistvo* 24, No. 5, 38-41(1948); *Chem. Zentr.* (Russian Zone Ed.) **1949**, I, 748. A study was made of the changes in fish diet during boiling, pressing, drying, extraction, and distillation. During drying the acid no. increased from the original of 1.58 to 25.4; after distillation it was 26.9. The iodine no. dropped from 119.5 to 102.4 and the n^{17} increased from 1.4775 to 1.4800 during drying, owing to hydrolysis and oxidation and polymerization. During the processing the color changed from light yellow to dark brown and it acquired a characteristic sharp odor and taste. The fat was scarcely changed by extraction with naphtha. It is recommended that drying of the expressed intermediate product be eliminated by using higher pressure when expressing the oil. (*Chem. Abs.* **46**, 7795)

An approach to continuous Twitchell fat splitting. C. B. Cox. *Trans. Inst. Chem. Engrs.* (London) **27**, 123-37(1949). The paper consists of a brief description of the Twitchell process, a discussion of the basic kinetic and equilibrium data, an examination, in the light of experimental data, of the case where fresh water is used for each stage of a 3-stage split, an examination in which the same water is used over and over again for different stages of successive batches, and a consideration of the possibility of using the Twitchell process continuously under moderate pressure. The analytical methods discussed in this paper should be applicable to the operation of a counter-current column. (*Chem. Abs.* **46**, 7794)

The precipitation of oxidized linseed fatty acids by urea. G. N. Catravas and G. Knafo (Lab. Chevruel, Paris). *Bull. mens. ITERG* (Inst. tech. etudes et recherches corps gras) **6**, 43-8 (1952). The new method of precipitating aliphatic straight-chain compounds with urea was tried in the quantitative separation of oxidized products of linseed oil fatty acids from those not affected by the oxidation. It was proved that the complex compounds contain oxidized and nonoxidized products and that the proposed method is not selective. Formulas of the possible oxidation products are discussed. (*Chem. Abs.* **46**, 7794)

Ternary mixtures of fatty acids. VII. Freezing points of mixtures of capric, lauric, and myristic acids. C. Paquot and Mme. J. Petit (Lab. C.N.R.S., Bellevue, France). *Bull. soc. chim. France* **1952**, 139-40. A ternary diagram of the freezing points of mixtures of capric, lauric, and myristic acids has the same general appearance as that reported previously for mixtures of myristic, palmitic, and stearic acids. The ternary eutectic occurs at 15.5° and contains 68, 21, and 11 mole % of C_{10}, C_{12}, and C_{14}, respectively.

VIII. Freezing points of mixtures of lauric, myristic, and palmitic acids. C. Paquot, J. Mercier, and Mme. J. Petite. *Ibid.* 140. The ternary eutectic for this system occurs at 30.1° and contains 67, 21, and 12 mole % of C_{12}, C_{14}, and C_{16}, respectively. (*Chem. Abs.* **46**, 7793)

Paper chromatography in the field of fats. X. Fluorescent dyes as indicators in the paper chromatographic analysis of fat acids and fats. H. P. Kaufmann and J. Budwig (Chem. Landesuntersuchungsamt Nordrhein-Westfalen, Munster/Westf., Ger.). *Fette u. Seifen* **54**, 7-10(1952). In separating and identifying linoleic, oleic, elaidic, erucic, stearic, caproic, caprylic, heptanoic, pelargonic, decanoic, octenoic, and undecylenic acids, the following fluorescent indicators are of value: quinine, Acridine Orange, Rhodamine B, Fluorol G, chlorophyll, anthracene, anthranol, and combinations of quinine with Rhodamine B, Rhodamine B with chlorophyll, Na salt of methionine with Rhodamine B, and $HSCH_2CO_2H$ with Rhodamine B.

XI. Identification and separation of conjugated unsaturated fat acids. H. P. Kaufmann, J. Budwig and C. W. Schmidt. *Ibid.* 10-12. The paper chromatography of 9,11-linoleic acid, 9,12-linoleic acid, β-eleostearic acid, and β-licanic acid has been investigated by using reactions with inorganic salts and dyeing with organic dyes. The acids must be separated before identification. This is done by developing the mixture with 75%, 80%, and 85% methanol-water; 9,12-linoleic acid and β-licanic acid move faster than 9,11-linoleic acid, and β-eleostearic acid is slowest.

XII. Identification and separation of conjugated fat acids. 2. *Ibid.* 73-6. Diels-Alder reaction with conjugated fat acids can be carried out on paper with minute quantities of reactants and can be used for the isolation of conjugated fat acids from mixtures. Conditions are very critical. (*Chem. Abs.* **46**, 7793)

Oily flavor in butter and α,β-unsaturated carbonyl compounds. U. Holm, G. Wode, and K. E. Thome. *Medd. Statens Mejeriforsok* No. **37**, 14 pp. (1952). Cinnamaldehyde reacts with m-phenylenediamine-di-HCl to give a colored compound with the same absorption maximum, 370 mμ, as given by α,β-unsaturated carbonyl compounds present in oxidized butterfat. With cinnamaldehyde as a standard of reference, relative values of α,β-unsaturated carbonyl compounds are expressed in mg. % of cinnamaldehyde. Oily flavored butter made from ripened cream contains α,β-unsaturated carbonyl compounds in quantities related to the intensity of the off-flavor. Butter with no oily flavor does not contain α,β-unsaturated carbonyl compounds. Concentrates of the flavor substances from oily-flavored butter contain α,β-unsaturated carbonyl compounds. If neutralization of the butter moisture prevents the development of oily-flavored butter, no α,β-unsaturated carbonyl compounds are formed. (*Chem. Abs.* **46**, 7668)

Investigation of fat-containing palm fruits from Surinam. W. Spoon and Wa. M. Sesseler. *Olien Vetten en Oliezaden* **34**, No. 3, 25, No. 4, 41(1950); *Ber. Afdel. Trop. Product Koninkl. Ver. Indisch. Inst.* No. **227**, 28 pp.(1950). The composition and properties of the various kinds of fat in the fruits of the following palms were determined: awara *(Astrocaryum segregatum)*, maurite *(Mauritius flexuosa)*, paramaka *(Astrocaryum paramacca)*, maripa *(Maximiliana maripa)*, boegroemaka or muru-muru *(Astrocaryum sciophilum)*. These palm fruits have in the fruit coat (pericarp) a fibrous layer which contains fat and surrounds a nut with a hard shell, the kernel of which also contains fat. The pericarp fats have a high % of free fatty acids, much higher than the seed fats. The pericarp fats are more oily than the kernel fats and are orange-colored on account of the carotene content. The pericarp fats appear to be composed mainly of glycerides of palmitic-, stearic-, and oleic acids, whereas seed fats consist of lauric-, myristic-, and fatty acids of lower molecular weight. Unsaturated fatty acids are practically absent in seed fats and found to a small extent in pericarp fats. Results of analyses are tabulated (*Chem. Abs.* **46**, 7673)

The chemistry and metabolism of fats in fish. J. A. Lovern (Torry Research Sta., Aberdeen, Scot.). *Biochem. Soc. Symposia* No. **6** *(Biochemistry of Fish)* 49-62(1951). A review. The fats of fishes are of more complex fatty acid composition than those of many land animals. (*Chem. Abs*: **46**, 7664).

Lipids in Arctic marine mammals. C. G. Wilber and X. J. Musacchra. *J. Mamm.* **31**, 162-7(1950). Examination of the polar bear, *Thalarctos maritimus*, walrus, *Odobenus obesus*, and the ringed seal, *Phoca hispida*, revealed a high fat metabolism in the seal, large amounts of liver fatty acids in the bear, and normal marine mammalian content in the walrus. (*Chem. Abs.* **46**, 7630)

Conjugated lipids. III. The configuration of sphingomyelin. Y. Fujino (Hokkaido Univ., Sapporo). *J. Biochem.* (Japan) **39**, 45-53(1952). It was shown that linkage of the phosphorylcholine groups to a primary alcohol group exists in the sphingosine group of sphingomyelin.

IV. The enzymic hydrolysis of sphingomyelin. *Ibid.* 55-62. Nucleosidase was prepared from young pig spleen and incubated with sphingomyelin in the presence of Mg^{++} at pH 7.9 at 37°. The maximum enzymic decomposition of sphingomyelin was observed on the 6-7th day, showing 95 and 92% liberations of inorganic and acid-soluble P, respectively. A scheme representing the enzymic transformation of phospholipids is given. (*Chem. Abs.* **46**, 7596)

Dehydration of dihydroxy fatty acids and esters. M. Naudet and P. Desnuelle (Faculte sci., Marseille). *Bull. soc. chim. France* **1951**, 655-61. Dihydroxystearic acid and its esters with monohydric alcohols are dehydrated very easily by short heating at 290-300° in the presence of 0.5% $p\text{-}CH_3C_6H_4SO_3H$. During the dehydration the expected formation of ketones does not occur. For each 100 OH groups that disappear, there appear 70 new double bonds, about half of which are in conjugated position. The dehydrated product possesses a higher iodine number; the crude product contains 32% linoleic acid and the distilled product 45%. Analogous results are obtained when, in place of pure dihydroxystearic acid, a technical product prepared from different oils (e.g., colza oil) rich in mono-unsaturated acids is used (*Chem. Abs.* **46**, 7525)

Oxidation of methyl linoleate. Y. Toyama and I. Matsumoto (Univ. Nagoya). *Fette u. Seifen* **53**, 523-4(1951). Methyl linoleate was oxidized in acetic acid with O_2 in the presence of a Co resinate catalyst. After absorption of approximately 1 mole O_2/mole methyl linoleate, the product was brominated, the brominated product oxidized with $KMnO_4$, and the oxidized product debrominated. The final product consisted of dimeric oxidation products, azelaic acid, saturated monobasic acids of the C_3 and C_4 series, monobasic acids of the C_5 and C_6 series containing 1 double bond, and monobasic acids of the C_9 series with 2 double bonds; no unsaturated dibasic acids were found. The double bonds of the unsaturated monobasic acids found are mostly situated near the CO_2H groups; they give iodine numbers which differ greatly from the calculated values. It is concluded that the majority of the oxidation products of methyl linoleate are compounds in which the double bond at the C_9 atom is attacked by O_2 but the other double bonds are only partially or not at all affected. (*Chem. Abs.* **46**, 7521)

Chemical examination of the fixed oil derived from the wood of Dalbergia sissoo. Y. P. Kathpalia and S. Dutt (Delhi Univ.). *Indian Soap J.* **17**, 235-7 (1952). The heartwood of *D. sissoo* in the form of shavings was extracted with petroleum ether at 40-60° and filtered. The solvent was removed by distillation and the residue steam-distilled at 110° to recover the essential oil present. It has the following characteristics: d^{50} 0.9132, n^{20} 1.5311, saponification value 192.5, iodine value 31.3, acetyl value 3.9, acid value 0.65, Reichert-Meissl value 0.79, Hehner value 91.5, and unsaponifiable matter 2.56%. The following fatty acids were found in the oil: myristic 5.6, palmitic 21.8, stearic 24.3, arachidic 19.4, linoleic 10.8, and oleic 9.4%. (*Chem. Abs.* **46**, 8395)

Hardening of rice oil with nonreduced nickel-copper-diatomaceous earth catalyst. S. Ueno, H. Sakurai, and T. Kawanaka (Osaka Univ.). *J. Chem. Soc. Japan*, Ind. Chem. Sect., **53**, 43-4(1950). Rice oil was autoclaved at 180° for 1 hour in the presence of Ni-Cu-diatomaceous earth catalyst. The catalyst is prepared as follows: Ni and Cu are precipitated by adding Na_2CO_3 to the solution of $NiSO_4$ and $CuSO_4$, and the resulting precipitate is washed and dried at 110°. Diatomaceous earth is ignited and mixed with the precipitate. The catalyst is useful for the hardening of rice oil from which wax has been eliminated. (*Chem. Abs.* **46**, 8395)

Heat treatment of vegetable oils. I. Heat-treated olive oil and its decomposition products. J. Petit and G. Bosshard. *Bull. soc. chim. France* **1952**, 293-6. Olive oil with an acid no 0.9, saponification no. 191.6, iodine no. 87.4, and n^{25} 1.4698 heated in a glass distilling flask to 330 ± 5° for 4 hours, at 20 mg. pressure in N_2 atmosphere gave 290 g. polymerized oil, 185 g. volatile condensate, and 25 g. uncondensed losses, mostly CO_2, CO, and light ethylenic hydrocarbons. Of the volatile condensates 40.6% were hydrocarbons and 59.4% acids. These data indicated that during the heat treatment of olive oil the break in the oleic acid chain occurs near but not necessarily at the double bond. (*Chem. Abs.* **46**, 8395)

Composition of poppyseed oils. R. E. Bridges, M. M. Chakrabarty, and T. P. Hilditch (Univ. Liverpool Engl.). *J. Oil and Colour Chemists' Assoc'n.* **34**, 354-60(1951). Oil from 2 samples of English-grown and 1 Indian-grown poppy seed were examined. Linoleic acid formed 72-73% of the total, and the remainder was oleic and saturated acids in approximately equal proportions. Linolenic acid was absent. Analysis for glyceride composition of the oils showed 66-69% of the di- and 27-21% of trilinolein. It is suggested that all oils containing linoleic acid > 67% of their total acids be classified as linoleic-rich type irrespective of agricultural origin. The oils from sunflower, safflower, niger, tobacco, and poppy seeds are of this type. (*Chem. Abs.* **46**, 8394)

Solvent extraction of industrial wastes and by-products. T. S. Ramaswamy, T. Venugopal, and V. Parameswaran (Tata Mills Co., Tatapuram). *Indian Soap J.* **17**, 241-3(1952). Production figures for oil seeds, oils, and oil cakes in India are given for the following: peanut, rape, mustard, linseed, sesame, castor, coconut, and cottonseed. The subject is discussed under the following headings: waste of oil in industrial by-products, oil from industrial wastes, solvent extraction, and scope for solvent extraction in India. (*Chem. Abs.* **46**, 8394)

Fluorescence test for the detection of argemone oil in mustard oil. S. N. Sarkar and D. L. Nandi (Nilratan Sarkar Med. Coll., Calcutta). *Current Sci.* (India) **20**, 232-3(1951). To 1 ml. of concentrated HCl and 0.5 ml. of ethanol is added 2 ml. of oil sample. The mixture is shaken for 1 minute and then heated in a boiling water bath for about 10 minutes with occasional shaking. A pinkish fluorescence in the lower acid layer when viewed under ultraviolet light indicates the presence of argemone oil in the mustard oil. The test is sensitive to 0.25% argemone oil. (*Chem. Abs.* **46**, 8394)

Buckwheat fat. Cl. Branzke (Humboldt-Univ., Berlin). *Deut. Lebensm.-Rundschau* **48**, 118-19(1952). A sample of fat extracted from German buckwheat grist was analyzed with the following results: d^{50} 0.8586, n^{60} 1.4619, melting point (initial) 39.6°, melting point (clear) 43.6°, acid no. 33.2, saponification no. 177.8, iodine no. (Hanus) 119.1, Reichert-Meissl no. 0.57, Polenske no. 0.66, and unsaponifiable matter 6.1%. Analysis of the fatty acids produced the following results: n^{40} 1.4571, melting point (clear) 38.9°, neutralization no. 196.1, iodine no. (Hanus) 135.2, linoleic acid 24.6%, and linolenic acid 9.9%. (*Chem. Abs.* **46**, 8282)

Lipids of the vertebrate central nervous system. I. Brain. J. D. McColl and R. J. Rossiter (Univ. Western Ontario, London, Can.). *J. Exptl. Biol.* **29**, 196-202(1952). The concentration of water, cerebroside (glycosphingoside), free and total cholesterol, total phospholipid, monoaminophospholipid (phosphoglyceride), and lecithin (phosphatidylcholine) was determined in the brains of a series of vertebrates, including representatives of the cartilaginous and bony fishes, amphibians, reptiles, birds, and mammals. The brains of each of the species contained only a small concentration of cholesterol ester, and unlike the nervous system of certain invertebrates, the brains of all species contained some cerebroside. The concentration of each lipid was similar for different individuals of the same species, but for the various species within one class the mean concentration of many of the lipids differed greatly. The mean concentration of total myelin lipid and that of each of the individual myelin lipids were greater for brains of the mammals than for those of the lower vertebrates.

II. Spinal cord. *Ibid.* 203-10. Similar studies carried out on the spinal cords showed only low concentrations of cholesterol ester in the cords. The concentration of total cholesterol, sphingolipid, and myelin lipid was greater in the cords of mammals than in those of the lower vertebrates. Expressed as percentage of essential lipid, the concentration of cerebroside, cholesterol, sphingomyelin, sphingolipid, and myelin lipid, but not of lecithin and cephalin, was greater in the spinal cord than in the brain. The mean concentration of cerebroside was negatively correlated with that of sphingomyelin. (*Chem. Abs.* **46**, 8278)

Time dependence of boundary tensions of solutions. III. Thermodynamics of the boundary-bulk equilibrium of fatty acids in hexane-water systems. A. F. H. Ward and L. Tordai (Univ. Manchester, Engl.). *Rec. trav. chim.* **71**, 482-9(1952). With the aid of equations previously developed and interfacial tension data for lauric, palmitic, and stearic acids in hexane on water calculations are made for activity in bulk (a_2) and in the interface and the equilibrium constant for dimerization (K_{12}). $K_{12} = (c - a_2)/2a_2$. K_{12} is 0.97×10^4 for lauric and 1.3×10^4 for palmitic over a range of concentrations, there being a simple equilibrium of monomer to dimer for these acids, but varies from 4×10^2 to 3.3×10^4 for stearic, there being a complicated equilibrium. Thickness of adsorbed layers, standard free energies, and equilibrium constants for adsorption are calculated. The standard free energy of transference of the carboxyl group from the gas phase to the hexane environment is —2.8 kcal./mole. (*Chem. Abs.* **46**, 7841)

The seed fat of Phaseolus vulgaris. E. Takahashi, N. Ito and O. Maeda (Hokkaido Univ., Sapporo). *J. Agr. Chem. Soc. Japan* **22**, 126-7(1949). The fat of the bean (white sort), *Phaseolus vulgaris*, obtained in the yield of 56 g. from 75 kg. beans, gave d^{15} 0.9384, n^{20} 1.4752, acid no. 37.2, saponification no. 193.0, iodine no. (Wijs) 150.5, SCN no. 82.4, and unsaponifiable matter 7.1%. Solid fatty acids (25.1% of nonvolatile fatty acid mixture) consisted of palmitic 70, stearic 17, and cerotic (?) 13%. Liquid fatty acids (74.9%) consisted of oleic, linoleic, and a little linolenic acids. Unsaponifiable matter consisted of stigmasterol, m. 169°, and another phytosterol, m. 136-7°. (*Chem. Abs.* **46**, 8392)

Fatty acids. Part I. 9-hydroxyoctadec-12-enoic acid, a new hydroxy-acid occurring in Strophanthus sarmentosus seed oil. F. D. Gunstone (Univ. Glasgow). *J. Chem. Soc.* **1952**, 1275. The unsaturated hydroxy-acid which forms 6.6% of the component acids of *Strophanthus sarmentosus* seed oil has been shown to be 9-hydroxyoctadec-12-enoic acid.

Physical properties of fatty acids. II. Some dilatometric and thermal properties of palmitic acid. T. L. Ward and W. S. Singleton (South. Reg. Res. Lab., New Orleans, La.). *J. Phys. Chem.* **56**, 696-98(1952). The expansion of palmitic acid in the solid and liquid states was found to be 0.000280 and 0.000968 ml./g./°C., respectively. The melting dilation found was 0.1806 ml./g. and the heat of fusion 51.2 cal./g. The specific volume over a range of temperatures, the specific heat, and the entropy were also determined.

On the mechanism of enzyme action. XLVIII. Investigation of the fat of Fusarium lini bolley by means of urea adducts. J. A. Maselli and F. F. Nord (Fordham Univ., New York). *Arch. Biochem. Biophys.* **38**, 377-83 (1952). Stearic acid has been isolated and identified from the fat of *Fusarium lini bolley* by purification of the solid fraction obtained from the urea adduct of its fatty acids.

Volatile fatty acids of Ascaris lumbricoides from the pig. Vivien Moyle and E. Baldwin (Univ. Cambridge). *Biochem. J.* **51**, 504-10(1952). Acetic, propionic, and n-butyric acids account for less than 20% of the steam-volatile fatty acids present in the perienteric fluid of *Ascaris lumbricoides* (a parasitic nematode). The C_5 fraction (40%) consists almost entirely of 2-methylbutanoic acid. The C_6 fraction has not been identified.

Hydrolysis of fats by bacteria of the Pseudomonas genus. M. L. Goldman and M. M. Rayman (QM Food and Container Inst. for the Armed Forces, Chicago, Ill.). *Food Res.* **17**, 326-37(1952). Susceptibility of different fats to microbial hydrolysis appears dependent upon the particle size of the emulsified fats and not on the composition of the component triglycerides. Thus substantially the same degree of cleavage was achieved with butter, lard, tallow, coconut, soybean, and peanut oils. Emulsified fats undergo 90-95% hydrolysis at fat concentrations below 10 g. per 100 ml. medium. At higher fat levels (up to 20 g. per 100 ml.) hydrolysis is less complete.

Oxidation of crude solid paraffins to fat acids. H. Anders. *Fette u. Seifen* **54**, 77-80(1952). Laboratory-scale experiments show that air oxidation of crude solid paraffins with $KMnO_4$ catalyst is possible without preliminary purification. The reaction is catalyzed by volatile oxidation products and can be carried out at a temperature of 120°. The apparatus used is described in detail. (*Chem. Abs.* **46**, 7343)

Solvent extraction of oil from cottonseed prior to the removal of linters and treatment of the residue to effect separation of meal, hull, and linters. S. P. Clark and A. C. Wamble. *Bull. Agr. Mech. Coll. Texas* **7**, No. 2; *Texas Eng. Expt. Sta. Bull.* No. 125, 77 pp.(1951). A preliminary investigation was made of the technical and economic feasibility of the solvent extraction of oil from comminuted whole seed and the separation into protein, linters, and hulls by laboratory and pilot-plant equipment. The process is feasible when applied to seed from which the first-cut linters have been removed but is not feasible when applied to whole seed. Standard equipment is satisfactory. (*Chem. Abs.* **46**, 7344)

Effect of pure salt on the oxidation of bacon in freezer storage. A. M. Gaddes (U. S. Dept. Agr., Beltsville, Md.). *Food Tech.* **6**, 294-98(1952). Concentration of analytical grade sodium chloride had a statistically significant direct influence on the rate of oxidation of bacon sides during curing and subsequent freezer storage at 0°F.

Antioxidants and food preservation. R. W. Bentz, T. J. O'Grady and S. B. Wright (Tennessee Eastman Co., Kingsport, Tenn.). *Food Tech.* **6**, 302(1952). Efforts to retard oxidative rancidity in fats and fat-containing foods frequently fail due to incomplete understanding of antioxidants and their use. Data illustrate the increased storage life that can be expected.

Use of antioxidants in the frozen storage of turkeys. A. A. Klose, E. P. Mecchi and H. L. Hanson (West. Reg. Res. Lab., Albany, Calif.). *Food Tech.* 6, 308-11(1952). A marked reduction in rancidification of the skin and cut meat surface of turkeys in frozen storage was demonstrated by the use of aqueous gelatin coating containing antioxidants.

The refining of cottonseed oil. E. D. Garner (San Joaquin Cotton Oil Co., Chowchilla, Calif.). *Oil Mill Gaz.* **57**(1), 36-37 (1952). The advantages of the Clayton process for refining oils are discussed briefly.

Cleaning and processing soybeans. T. Hutchison (W. Tenn. Soya Mill, Tiptonville). *Oil Mill Gaz.* **57**(1), 58-59(1952). The author urges that greater discounts for high moisture soybeans be instituted.

Can solvent extraction installation be justified based on current crude oil values? R. Woodruff (Osceola Prod. Co., Osceola, Ark.). *Oil Mill Gaz.* **57**(1), 59-61(1952). Under the present conditions, the author believes that a 200 ton/day plant is the minimum economically sound installation.

Operating features of filtration-extraction and other solvent extraction processes. E. A. Gastrock, E. L. D'Aquin and J. J. Spadaro (So. Reg. Res. Lab., New Orleans, La.). *Oil Mill Gaz.* **57**(1), 26-29(1952). The various unit operations required in the filtration-extraction process are compared, briefly, with those of the direct extraction and the pre-press extraction processes. The filtration-extraction process is claimed to have the advantages of relatively low equipment cost and excellent extraction efficiency.

Material balances for filtration-extraction and four conventional methods of processing cottonseed. E. A. Gastrock, P. H. Eaves and E. L. D'Aquin (So. Reg. Res. Lab.. New Orleans, La.). *Oil Mill Gaz.* **57**(1), 62-63(1952). Material balances on the processes are given from data obtained at the So. Reg. Res. Lab.

A comparison of extraction processes, hydraulic, screw press and solvent. A. C. Wamble (Cottonseed Prod. Res. Lab., College Station, Texas). *Oil Mill Gaz.* **57**(1) 64-65(1952). The plant costs and direct operating costs of the processes are given.

The determination of fat peroxide in small samples of the lean and fatty tissues of meat by the ferric thiocyanate method. G. H. Smith (Univ. Cambridge). *J. Sci. Food Agr.* 3, 26-31 (1952). The photometric ferric thiocyanate procedure of Loftus Hills and Thiel for the estimation of fat peroxide has been adapted for the examination of the fat in small samples of the lean and fatty tissues of meat. The peroxide value of the fat in powdered dry whole meal was found to increase 10-20% on exposure to direct sunlight for 15 minutes.

Factors to consider before converting to solvent extraction. H. Moore. *Oil Mill Gaz.* **57**(1), 67-68(1952). An excellent article pointing out the need to consider many diverse factors such as marketability of the meal, availability of other oil seeds, location of the plant, and state safety regulations, before converting to a solvent extraction plant.

Preparation of milk fat. II. A new method of manufacturing butteroil. C. M. Stine and S. Patton (Penna. Agr. Exp. Station, State College). *J. Dairy Sci.* 35, 655-60(1952). Several surface active agents were found to be effective for quantitatively de-emulsifying cream. Butteroil so prepared compared favorably in quality with the butteroil produced by churning.

An ester-fractionation method for the component fatty acid analysis of mixtures containing hydroxy fatty acids. K. T. Achaya and S. A. Saletore (Central Labs. Sci. Ind. Res., Hyderabad, India). *Analyst* 77, 375-80(1952). Saturated acids are removed from the mixture to be analyzed by the lead salt-alcohol separation. Ricinoleic acid is separated from oleic by urea treatment to form the insoluble oleic acid adduct. The composition of the original mixture is calculated from the values of the saponification equivalents and iodine values of the fractionated methyl esters of the saturated and oleic-linoleic acid extracts and of the fractionated acetylated methyl esters of the ricinoleic acid extract.

An x-ray and thermal examination of glycerides. XII. Chaulmoogric and hydnocarpic acids and their mono-, di-, and triglycerides. A. Gupta and T. Malkin (Univ. Bristol). *J. Chem. Soc.* **1952**, 2405-08. In contrast to the behavior of straight chain fatty acids, chaulmoogric and hydnocarpic acids show no evidence of polymorphism. Their glycerides, however, exist in α-, β'-, and β-forms. X-ray and melting point data for the various forms are recorded.

Antioxidants provide new flavor controls. A. V. Gemmill. *Food Eng.* 24(5), 102-5(1952). A brief review of the use of antioxidants in fats and fat-containing foods.

Studies on lipase from oil seeds. Part XV. Effect of concentration of the accelerators on the hydrolysis of groundnut oil by castor lipase (Ricinus communis). C. V. Ramakrishman and B. N. Banerjee (Indian Inst. Sci., Bangalore-3). *J. Indian Chem. Soc.* 29, 400-2(1952). Hydrolysis of groundnut oil by ricinus lipase was carried out with different concentrations of various accelerators. Glycine and acetic acid were the best.

Vapor pressure of methyl esters. D. S. Davis (Virg. Poly. Inst.). *Chem. Proc.* **15**(9), 192(1952). A line coordinate chart is presented relating the vapor pressure and temperature of various methyl esters.

The castor bean, industrial oil seed. W. E. McIntyre (Ill. State Normal Univ.). *Scientific Monthly* 75, 42-46(1952). A review is given of recent progress in adapting the castor bean to U. S. climate and harvesting methods.

The preparation of octadec-6-enoic acid (petroselinic) by simultaneous extraction-saponification from parsley seeds. J. H. Skellon and J. W. Spence (Acton Tech. College, London, W. 3). *Chemistry & Industry* **1952**, 691. Crushed parsley seeds are treated with alcoholic KOH and the fatty acids separated from this extract. Petroselinic acid is separated as the lithium salt.

Relations between structure and functions of the wax gland of the bird. G. Weitzel (Max-Planck-Gesellschaft, Göttingen, Ger.). *Fette u. Seifen* **53**, 667-71(1951). The fat acids of the wax gland (I) of the duck consisted of about 1/3 straight-chain and 2/3 branched-chain fat acids; 36% of the acids were steam-volatile branched-chain acids of molecular weights between C_7 and C_{10} which were optically active. The fractions of higher molecular weight also contained considerable amounts of optically active branched-chain acids having molecular weights between C_{10} and C_{18}. These were identified as major constituents: l-4-methylhexanoic acid and l-10(?)-methylheptadecanoic acid. The I of the goose did not contain the steam-volatile acids found in the I of the duck; only acids between C_{13} and C_{18} were found. Over 80% of these acids were liquid; their iodine number was about 12. Large amounts of methyldodecanoic and methyltridecanoic acids were found in the liquid fraction. Feeding ducks and geese special diets containing either highly saturated or highly unsaturated fat acids caused changes in the fat-acid composition throughout the body, except in I. The fact that the secretion of I sticks tenaciously to the feathers, stays oily even at very low temperatures, and is not affected by O and sunlight is explained by the presence of the branched-chain acids which act as plasticizers and which are saturated and thus not subject to drying. (*Chem. Abs.* **46**, 7641)

SINITIRO KAWAMURA

Fat-splitting agent prepared from naphthalene, 2,2′-binaphthyl, n-butyl alcohol, and sulfuric acid. Kazuo Fukuzumi, Shimpei Ozaki, and Yutaka Yamada (Nagoya Univ.). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **55**, 405-6(1952). The sulfonate mixture prepared from the 4 compounds given above was a superior fat-splitting agent to dibutylnaphthalenesulfonate, which in turn was superior to commercial Kontakt (German) for coconut oil.

Refining of rice oil by methanol extraction. II. Jun'ichi Kawai and Harue Ukiya. *J. Chem. Soc. Japan*, Ind. Chem. Sect. **55**, 381-3(1952). Continuous extraction of free fatty acids from crude rice oil by MeOH was investigated. The greater the flow rate of MeOH, the greater was the amount extracted, and the more rapid was the decrease in acid no. Higher temp. and stirring accelerated the lowering of acid no., but the higher temp. decreased the yield of refined oil.

Effect of supersonic waves on liver oils. Toshio Agawa, Yûji Higashi, and Saburô Komori (Osaka Univ.). *J. Chem. Soc. Japan*, Ind. Chem. *Sect.* **55**, 399-400(1952). Liver oil was temporarily deodorized by supersonic waves, but the odor reappeared. The unsap. could be completely deodorized by supersonic waves. Kitol was partly (25%) decomposed by supersonic waves to give vitamin A.

Eyeball oil of sword-fish (Xiphias gladius). Ryôhei Kaneko and Tomotarô Tsuchiya (Govt. Chem. Ind. Research Inst., Tokyo). *J. Chem. Soc. Japan*, Ind. Chem. Sect. **55**, 362-3 (1952). The eyeballs of 143 fish weighing 167 kg. yielded about 20 kg. oil, which had d^{20} 0.9261, n^{20} 1.4812, acid no. 8.8, sap. no. 189.2, iodine no. 188.3, unsap. 0.72%. The fatty acids consisted mainly of unsat'd. acids, clupanodonic ($C_{22}H_{34}O_2$), more unsat'd. than this (probably $C_{22}H_{32}O_2$), $C_{20}H_{32}O_2$, $C_{20}H_{30}O_2$, oleic, and cetoleic; sat'd. acids such as palmitic and higher homologs were present in minor amounts. The unsap. contained cholesterol, but no hydrocarbon nor vitamin A nor kitol.

Liver oils of fishes, Spheroides rubripes and Doderleinia berycoides. Tomotarô Tsuchiya (Govt. Chem. Ind. Research Inst., Tokyo). *J. Chem. Soc. Japan,* Ind. Chem. Sect. **55**, 375-7 (1952). These 2 fish-liver oils had, resp., d^{25} 0.9238, 0.9162; n^{25} 1.4785 (25°), 1.4703 (20°); acid no. 0.66, 1.02; sap. no. 183.7, 190.4; iodine no. 162.6, 94.3; unsap. 1.65, 2.06%. The first liver oil contained 18% sat'd. (palmitic and stearic) and 82% unsat'd. (C_{16}-C_{22}, clupanodonic and other highly unsat'd. as well as oleic) acids. The second liver oil contained 14% sat'd. (C_{16} and C_{18}) and 86% unsat'd. (oleic and zoomaric with less clupanodonic and other) acids.

Oil refining by colloidal clay. Kôichi Takayasu. *J. Japan. Soc. Food Nutrition* 3, 133-7(1951). A yellow colloidal clay containing 40.21% SiO_2, 41.15% Al_2O_3, 1.95% Fe_2O_3, 2.20% CaO, and 1.35% MgO was converted to "activated silica gel" containing 92.45% SiO_2, 2.35% Al_2O_3, and 0.12% Fe_2O_3, by treatment with H_2SO_4 at 105°. Suitable materials were prepared by incorporating H_2SO_4 or NaOH in this activated silica gel. Sufficient amount of H_2SO_4 or NaOH could be adsorbed on the gel to make the mixture in powdered form. A simple and efficient method of refining fatty oils by using such products was devised. One of the advantages was the ease of filtration after treatment. Decolorization, deacidification, and deodorization could all be effected.

The refining of rice oil with high acid number by using a molecular still. Tetsujirô Obara and Keijirô Oka. *J. Japan. Soc. Food Nutrition* 3, 138-9(1951). Rice oil with acid no. 123 was fractionated into 6 fractions of distilling at 10^{-4} mm. Hg to give distillates of acid no. 199-150 and distillation residue of acid no. 15.6. In another experiment the rice oil of acid no. 49.9 was fractionated into distillate of acid no. 157.2 (26.5%) and residue of acid no. 6.0 (67.1%).

The past and future conditions in the supply and demand of fatty oils in Japan. Terufusa Iida (Dept. of Agr., Japan. Govt.). *J. Japan. Soc. Food Nutrition* 3, 128-32(1951). Economical and statistical. The consumption of oils for edible and other purposes will increase, as the standard of living advances.

Preparation and nutritive value of edible oils. Jun'ichi Ozaki (Food Research Inst., Tokyo). *J. Japan. Soc. Food Nutrition* 3, 132-3(1951). A brief report on studies of edible oils which were readily available soon after World War II, i.e., purified whale oil, polymerized whale oil, purified rice oil, hardened herring oil, and margarine.

PATENTS

Scrubber for solvent extraction towers. R. T. Anderson (V. D. Anderson Co.). *U. S. 2,609,186.* Apparatus is described for removing dust from the vapors discharged from a meal drier.

Process of protecting fatty and phosphorus lipoidic food products, particularly milk and dairy products, margarine and the like, against getting unpleasant taste or flavor. C. G. E. Sjostrom and A. V. Larsson. *U. S. 2,609,297.* A process is claimed for protecting milk, butter, margarine, and other edible dairy products against acquiring an unpleasant flavor by incorporating therein a relatively small amount of a protective agent. This agent is formed by subjecting an aqueous solution of a reducing sugar in the absence of air and at a temperature from 80-95° to treatment with alkali to bring the pH to 9.0-11.5 and then successively adding further alkali to raise repeatedly the pH of the material after it has fallen. This treatment is continued until the solution has protective properties.

Treatment of soya beans. P. A. Singer and H. J. Deobold (Allied Mills, Inc.). *U. S. 2,609,299.* A method is disclosed of preparing clean soybeans for solvent extraction which comprises cracking the beans to form grits, separating the hulls from the grits, sorting the grits by size and returning all grits larger than predetermined size for further cracking, adjusting the moisture content and temperature of the sized grits, and rolling the grits into flakes of substantially uniform size and thickness.

Stabilized emulsions and process of producing the same. A. B. Storrs and J. R. Froedge (Armour and Co.). *U. S. 2,609,300.* A heat sterilizable, stable oil-in-water type emulsion is described which contains as an emulsifier a fatty acid substituted protein hydrolyzate in which the fatty acid portion is at least 50% by weight of the protein hydrolyzate portion.

Preparation of a nickel catalyst dispersed in fat. S. Faulkner (E. F. Drew & Co.). *U. S. 2,609,346.* A method of making a catalyst body is disclosed which comprises a mixture of finely divided reduced nickel (20-32%), a glyceride fat melting between 105-150°F.(48-70%) and a filter aid (10-20%). The mixture is melted and poured into mold 1-3 inches deep whereby a small portion of a contained molten fat will rise to the surface to form an impervious film while the mixture is cooling to a solid without substantial segregation of nickel.

Edible fatty material. E. I. Valko (E. F. Drew & Co.). *U. S. 2,610,125.* An edible fatty composition is claimed consisting essentially of an edible fat having incorporated therein the diester of a polyglycol taken from the class consisting of ethylene and propylene glycols having a molecular weight of 400 to 2500 with at least one fatty acid having from 12 to 22 carbon atoms.

Distillation of fatty acids. E. A. Lawrence (Colgate-Palmolive-Peet Co.). *U. S. 2,610,142.* A method is claimed for removing entrained liquid particles from the vapor stream.

Recovery of unsaponifiables from concentrates containing the same. A. I. Gebhart (Colgate-Palmolive-Peet Co.). *U. S. 2,610,195.* A process of recovering cholesterol from tallow fatty acid still bottoms is disclosed which comprises saponifying the bottoms to form water soluble soaps of the saponifiable material therein; purifying the saponified bottoms by washing, graining, and settling to obtain a settled soap; preparing a dilute aqueous solution of the settled soap; extracting the settled soap solution with ethyl acetate to obtain a wet ethyl acetate solution of sterols; removing at least substantially all the water from the solution by azeotropic distillation; reacting cholesterol in the solution with oxalic acid under substantially anhydrous conditions to form a complex; separating the complex; and decomposing the complex to recover the cholesterol.

Winterized glyceride oil and process for producing the same. K. F. Mattil (Swift & Co.). *U. S. 2,610,915.* The cold test of a glyceride oil is claimed to be improved by the incorporation of a small amount of the polymerization product of esters of the following general formula $CH_2{=}\underset{\substack{|\\ X}}{C}{-}Y$ where X is hydrogen or a hydrocarbon and Y is either $-O-\underset{\substack{\|\\ O}}{C}-R$ or $-\underset{\substack{\|\\ O}}{C}-OR$ where R is a monovalent hydrocarbon radical of more than 4 carbon atoms or an oxy derivative thereof.

Process for treating tall oil with alkylene oxides. V. Esposito (R. M. Hollingshead Corp.). *U. S. 2,610,966.* Tall oil, free of unsaponifiable matter, is heated to 350-450°F. at a pressure from 2000-2400 psi with gradual addition of alkylene oxide. The pressure is slowly increased to 2800-3200 psi and the temperature to 550-650°F. with further addition of ethylene oxide.

Stabilization of glyceride oils. C. D. Evans, A. W. Schwab and J. C. Cowan (Sec. Agr.). *U. S. 2,610,973.* A glyceride oil and a stabilizing amount of phytic acid is claimed as a new composition of matter.

Method and apparatus for manufacturing margarine. J. Rourke and W. T. Dow (Lever Bros. Co.). *U. S. 2,611,707.* A homogenizing device is described.

Oleaginous corrosion preventive composition. B. L. Costello. *U. S. 2,611,711.* An oleaginous composition is disclosed which is characterized by the ability to prevent corrosion of metallic surfaces and to be easily removed therefrom consisting of about 47% by weight soybean oil, about 33% sperm oil and about 20% linseed oil.

Distillation apparatus for refining fats and oils. J. E. Thompson. *U. S. 2,611,741.* A continuous deodorizer is described.

Decolorization of rice oil. T. Tsuchiya, et al. (to Tokyo Industrial Research Institute). *Japan. 861('50).* Rice oil is mixed with dilute H_2SO_4 at 70-100°, the sludge and the acid are separated, and then the oil is decolorized with 10% acid clay containing oxalic acid (0.1% of oil) at 120°. (*Chem. Abs.* **46**, 7797)

Hydrogenation of fats and oils by use of high-frequency electrode waves. M. Ohjyo. *Japan. 862('50).* In a hydrogenation apparatus, the oil, sprayed in mist form, and H are allowed to react in the vapor phase in the presence of high-frequency electrode waves (10^{7-8} cycles). (*Chem. Abs.* **46**, 7796)

Extraction of fats and oils. K. Kamibayashi. *Japan 1175('50).* Vegetable materials to be extracted are treated with a frequency of 20 Mc. between the electrodes in order to destroy the activity of lipase, e.g. in rice bran, and to change the material to a more extractable form. The material and a solvent are placed in an extractor with a frequency of 25 Mc. to shorten the time of extraction. (*Chem. Abs.* **46**, 7796)

Treatment of alkali "foot." T. Tsuchiya and H. Akiyama (to Tokyo Industrial Research Institute). *Japan. 1176('50).* Rice oil "foot" (100 g.) having no free alkali and containing 50% water is treated with 200 g. water and 0.5 g. Raney Ni. The mixture is hydrogenated at 20°, then heated to 100° and hydrogenated again, filtered, and decomposed with HCl to give a product having a melting point of 61° and an iodine No. of 16.5. (*Chem. Abs.* **46**, 7797)

Removal of acid from rice oil. S. Nojima. *Japan. 1819('50).* C_6H_6 (26 l.) containing 16.5 kg. rice oil with an acid no. 115.2 is neutralized with 20% of NaOH, 12 l. methanol is added, the mixture is allowed to stand for 12-24 hrs., and the C_6H_6 layer is washed with water and distilled to yield 6.6 kg. oil with an acid no. 1.3. The methanol layer is acidified with 10% warm H_2SO_4, and the methanol is removed by distillation to yield 9.1 kg. fat acid with an acid no. 184. (*Chem. Abs.* **46**, 8397)

Biology and Nutrition

R. A. Reiners, Abstractor

Carotenoids in fish. T. W. Goodwin (Univ. Liverpool, Engl.). *Biochem. Soc. Symposia* No. 6 *(Biochemistry of Fish)* 63-82 (1951). A review, with some new material. Only 3 xanthophylls occur in fish—lutein, astaxanthin, and a 3rd (probably taraxanthin). The occurrence in different species is tabulated. Carotenes are absent, except for β-carotene in the ovaries and perhaps in the liver. The functions of carotenoids in photoresponses and in reproduction are discussed. The source of vitamin A is obscure. (*Chem. Abs.* **46**, 7664)

Biological synthesis of fat from small molecules. G. Popjak Natl. Inst. Med. Research, London). *Brit. Med. Bull.* **8**, 218-22 (1952). The use of C^{14} in the study of fat synthesis in the lactating mammary gland, the synthesis of fatty acids from labeled acetate, and the synthesis of fat from labeled glucose are reviewed. (*Chem. Abs.* **46**, 7632)

Bactericidal action of cod-liver oil in the treatment of wounds. R. W. Spanhoff and H. C. Jacobsen. *Pharm. Weekblad* **85**, 742-50(1950). The bactericidal effect on wounds of cod-liver oil is ascribed to its volatile components, i.e., peroxides, and, to a lesser degree, aldehydes which are formed by oxidation. (*Chem. Abs.* **46**, 7614)

The digestibility of various oils and fats. T. M. Paul, V. R. B. Rao, and C. P. Anantakrishnan (Indian Dairy Research Inst., Bangalore). *Indian J. Vet. Sci.* **21**, 1-11(1951). Metabolic experiments on rats were conducted to determine the digestibility of butter fats and body fats from the cow, buffalo, goat, and sheep; of vegetable oils—groundnut, sesame, cottonseed, mustard, safflower, and coconut; and of three hydrogenated oils (vanaspatis) from each of groundnut, sesame, and cottonseed oils. The results, in order of decreasing digestibility were butter fats, vegetable oils, vanaspatis, and body fats. Hydrogenation of oils to yield products with melting point above 38° reduced their digestibility as compared to the base oils. Experimental and statistical data are given on two separate trials. (*Chem. Abs.* **46**, 8216)

Intestinal absorption and distribution of fatty acids and glycerides in the rat. III. Metabolism of lipids. S. Bergstrom, B. Borgstrom, and M. Rottenberg (Univ. Lund, Sweden). *Acta Physiol. Scand.* **25**, 120-39(1952). Stearic acid-1-C^{14} was fed to male albino rats. The labeled fatty acid was either incorporated into corn oil by transesterification or it was mixed with the free fatty acids from corn oil. Absorption of the glyceride was at about constant rate of 60 mg. per hr., and was practically complete in 4 hrs. About 5% of the isotope appeared in the feces. The labeled stearic acid was rapidly and extensively incorporated into the intestinal phospholipides. (Labeled palmitic and myristic acids were incorporated to a smaller extent.) Studies on the specific activity of the plasma glycerides indicate that the labeled glycerides entering the blood from the lymph are very rapidly absorbed by the organs before they are mixed with corresponding lipides of the plasma. Since the lymph glycerides contain about 90% of the labeled acid, the higher activity in the liver phospholipides after feeding labeled stearic acid indicates a rapid exchange of fatty acids between different lipide fractions. The rates of exchange of different fatty acids are quite different.

IV. Metabolism of lipids. B. Borgstrom. *Ibid.* 140-9. Rats were fed 3 mixtures containing stearic acid labeled with C^{14} in the carboxyl: (A) corn oil transesterified with the labeled stearic acid, (B) labeled acid dissolved in corn oil, or (C) corn oil with C^{14}-labeled cholesterol esters. The intestinal lymph contained highly variable amounts of fat, the average total recovery being for A 43.7, B 58.7, and for C 48.9% of the amount fed. The distribution of the lymph fatty acids is about the same in all 3 experiments (87% are glyceride fatty acids, 11% phospholipide fatty acids, and 2% cholesterol fatty acids). It is pointed out that the results of these experiments could be interpreted in accordance with either Verzar's or Frazer's absorption theory. (*Chem. Abs.* **46**, 8226).

Fat emulsions for oral nutrition. IV. Metabolic studies on human subjects. T. B. Van Itallie, W. B. Logan, R. L. Smythe, R. P. Geyer, and F. J. Stare (Harvard School of Public Health, Boston, Mass.). *Metabolism* **1**, 80-8(1952). Three normal men were given varying amounts of an oral fat emulsion (40% fat and 10% glucose) in addition to a diet low in protein and calories. The emulsion was well tolerated except when taken in large volumes. Weight loss was prevented by the emulsion, and N equilibrium was restored. Only insignificant increases in fecal fat occurred. Similar results were obtained in a study on a normal man hospitalized under conditions simulating those of surgery. (*Chem. Abs.* **46**, 8217)

Choline phosphatides in the metabolism of C_{12}, C_{16}, and C_{18} fatty acids. Marianne Levy (Sorbonne, Paris). *Arch. sci. physiol.* **5**, 289-304(1951). Rats weighing 200 g. were maintained a week on a 25% casein diet containing 10% pork fat (group I) or 10% trilaurin (group II) and were then transferred to a 5% casein diet (choline-deficient) in which the respective fat contents were increased to 40%. Thereafter at intervals the rats were killed and the livers analyzed for total fatty acids. Rats of group I developed fatty livers, while those of group II did not. (*Chem. Abs.* **46**, 8215)

Biochemical studies on dietary fats. I. Utilization of whale and fish oils and their effects on absorption of sugars and proteins. Y. Matsumura (Univ. Tokyo). *J. Japan Biochem. Soc.* **23**, 26-9(1951). The absorption coefficients in normal human adults of various fats and oils when administered at a rate of 40 g./day with a basal diet containing 13.3 g. fat are: purified *Balaenoptera physalis* oil 95.6%, polymerized *B. physalis* oil 94.8%, *Physeter macrocephalus* oil 93.2%, whale margarine 93.9%, shark oil 94.9%, sardine oil slightly hydrogenated (iodine value 120.0) 92.8%, moderately hydrogenated (iodine value 90.0) 92.0%, and highly hydrogenated (iodine value 62.3) 93.7%, and purified rice-bran oil 92.9%, in contrast to absorption coefficients without the supplementary addition of these oils (with 1 exception) of 75.9-77.4%. The excretion of fats in the feces is usually about 3 g./day irrespective of the amounts of fats administered; hence, there are increases in the absorption coefficients in high-fat diets. The addition of 40 g. of the above mentioned fats/day has no effect on the absorption coefficient of sugars, values exceeding 99% being obtained in every case. The excretion of N in the feces if, with some exceptions, approximately 20-25% of the N contained in the diet and is not affected by the addition of 40 g./day extra fats to the diet. (*Chem. Abs.* **46**, 8215)

SINITIRO KAWAMURA

Nutritive value of fin whale oil and the polymerized oil. I. Yoshito Sakurai, Yuzuru Katô, and Taizô Masuhara (Food Research Inst., Tokyo). *J. Japan. Soc. Food Nutrition* **3**, 155-6 (1951); *Rept. Food Research Inst.* (Tokyo) **2**, 59-62(1949). The refined fin whale oil proved harmless to white rats, even if added to the extent of 30% to the regular diet. At 20% it was as nutritive as soybean oil. Whale oil polymerized by heating at 295° for 4 hrs. was harmful to white rats at 20%, but it was not harmful at 5-10% of the diet.

Drying Oils

Stuart A. Harrison, Abstractor

Ring formation in the polymerization of linseed oil to stand oil and experiments with continuous method. B. Pennekamp, *Chem. Weekblad* **46**, 358(1950). Of the various theories advanced to define the structure of the polymerization products of glycerides, that of Kappelmeier (formation of cyclohexene rings via Diels-Alder addition) has the soundest basis. In recent years, a graphic-static method has confirmed ring formation in the polymer fractions in the thermal polymerization of linseed oil esters, and the smaller molecules (monomers) also have rings. Originally, in the production of stand oil, polymerization was thermal, more recently catalysts have been used. (*Chem. Abs.* **46**, 8386)

Some aspects of sulfurized linseed oil and alkali resistance of drying oil films. P. Slansky. *Paint, Oil Chem. Rev.* **115**, No. 19, 12(1952). When linseed oil is treated with sulfur monochloride, the two react to give a so-called sulfurized oil. The sulfur monochloride adds to the double bonds to saturate them and form disulfide linkages between the fatty acid chains. Some hydrochloric acid splits out during the reaction. Up to 15% sulfur monochloride can be added in this way, without causing gelation. Films of the resulting oil dry faster, are harder, and more alkali resistant than films of linseed stand oil.

The reaction between styrene and drying oils. S. Kut. *Paint Technol.* **17**, 253(1952). This is part four of a critical survey of published papers on the styrenation of oils.

Liquid thermal diffusion of tall oil. A. L. Jones and R. W. Foreman. *Ind. Eng. Chem.* **44**, 2249(1952). A study of the separation of tall oil into its component acids by thermal diffusion is reported. It was found that the rosin acids concentrate in the cold wall fractions and fatty acids in the hot wall fractions. When the hot wall fraction is again thermally diffused there is a partial separation of the fatty acids, the less unsaturated concentrating in the hot wall fraction and the more unsaturated concentrating with the rosin acids in the cold wall fraction. The method appears to have potential practical application for this type of separation.

The addition of driers to some alkyd varnishes. J. F. H. van Eijnsbergen. *Chem. Tech.* **7**, 2(1951). A linseed oil (48% of fatty acid) modified alkyd, a linseed oil (62% fatty acid) modified P.E. alkyd and a dehydrated castor oil (58% fatty acid) modified alkyd were made into varnishes; various combinations of naphthenate driers (Pb, Co, Mn, Zn, Ca) were added. Extensive test results on color, cloudiness, gelation, and skin formation for the varnishes, and drying time and water resistance for the films are given and discussed. The best combinations were (in % of resin); 0.2 Pb, 0.04 Co, 0.02 Mn; 0.2 Pb, 0.04 Co, 0.02 Mn, 0.1 Ca; 0.2 Pb, 0.04 Co. (*Chem. Abs.* **46**, 7788)

Reaction between styrene and drying oils and their fatty acids. J. Petit and P. Fournier. *Bull. Soc. Chem. France* **1952**, 287. Two linseed oils, a tung oil and linseed fatty acids were styrenated, the products saponified, separated into polystyrene, and lower molecular weight products. A slight weight excess of each oil was reacted with styrene at temperatures from 160 to 250°C. with benzoyl peroxide as catalyst. The conclusions are that the styrene may be attached to either the conjugated or to the simple double bond. It does not form true copolymers with drying oil and therefore, the reaction products contain unchanged oil, polymerized oils, styrene at different degrees of polymerization and the reaction products of one mole styrene combined to each acid radical with one or two double bonds. (*Chem. Abs.* **46**, 8386)

Copolymers in surface coatings. H. F. Payne, J. W. McNabb, J. H. Daniel Jr., C. H. Parker, and R. A. Calsibit. *Official Digest Federation Paint and Varnish Production Clubs* No. 332, 603(1952). A group of five papers is given which comprised a symposium on the subject held at the Polytechnic Institute of Brooklyn. The papers are largely reviews of past work on preparation and properties of styrenated oils, cyclopentadiene-drying oil copolymers, styrene-butadiene copolymers, vinyl chloride-vinyl acetate copolymers, and acrylonitrile-vinylidene chloride copolymers.

Styrenated alkyd resins. C. J. Meeske. *Verfkroniek* **23**, 159 (1950). Styrenated alkyds have limited compatibility with drying oils, alkyds, and most other resins, but are miscible with styrenated oils. To prevent thickening when grinding with active pigments, small amounts of diethyl amine or morpholine are useful. The resistance of stoved styrenated alkyd films to cold water or alkali is very good, to acids fairly good but to hot water poor. Aliphatic hydrocarbons and alcohols have little effect but aromatic hydrocarbons and esters attack the film. Accelerated and natural weathering tests, as far as they have gone, indicate that the durability of styrenated alkyds is greater than that of ordinary alkyds. (*Chem. Abs.* **46**, 8390)

The inhibition of linseed-oil drying. K. Meier and K. Mebes. *Farbe u. Tack* **58**, 215 (1952). A number of inhibitors were dissolved in linseed oil in a mole ratio of 1 to 10 and the weight increases of films of these oils on glass panels were determined daily for about 25 days. The time required to reach maximum weight was taken as a measure of efficiency of the oxidation inhibitors tested. On this basis p-amino phenol was the best, o- and m-amino phenol, p-phenylene diamine, hydroquinone and others were good whereas the naphthylamines, aniline, phenol, and others were fair. The oil is thought to form peroxide first, which in turn reacts with inhibitors. This prevents the start of the oxygen-catalyzed chain reaction which brings about the drying of oil. The theory of inhibitor action is reviewed. (*Chem. Abs.* **46**, 8387)

Radioisotopes in paint technology. G. G. Manor and O. M. Bizzel. *Paint Technol.* **17**, 241(1952). Discusses briefly what radioisotopes are, how they are prepared and what makes them useful. A table is given of a number of radioisotopes which are produced in a nuclear reactor. A number of possible uses of radioisotopes in paint technology are given: determination of size and number of holes in a paint film as well as its uniformity, determination of thickness, of wear resistance, and of continuity of films. It is suggested that information on the role of driers in paint films may be obtained by the use of radioisotopes.

Molecule enlargement in the field of fats. VI. Influence of catalysts on the drying of oils. H. P. Kaufmann and K. Strüber. *Fette u. Seifen* **54**, 134(1952). Organic free radicals are used to catalyze the drying of oils. Addition of 0.02% triphenyl methyl to crude tung oil decreased drying time from 40 hours to 5-10 minutes; other free radicals gave equally spectacular results. In general, free radical catalysts were more effective with conjugated unsaturated oils than with isolated unsaturated oils. Stand oils could be prepared with these catalysts in the absence of air at 180°. In the complete absence of oxygen no drying takes place but only traces are needed. (*Chem. Abs.* **46**, 7789)

Quantities of safflower oil available for use as drying oil. Anon. *Chem. Proc.* **15**(9), 34(1952). About 400 tank cars of safflower oil will be available in 1952-early 1953.

PATENTS

Modified alkyd resins from an alkyd resin and an alkoxy hydrocarbon silane. F. J. Sowa. *U. S. 2,605,243.* A soybean oil modified alkyd is made from 39 parts of soybean oil, 40.3 parts of phthalic anhydride and 28.3 parts of glycerol. The mixture is heated until the acid number is from 5-10. When the modified alkyd is dissolved in xylene and monoamyl triethoxysilane added in 1: 1 or 3: 1 ratio a baking composition is obtained. Films of this mixture baked at 300°F. for two hours have much greater alkali resistance than the original modified alkyd baked under identical conditions.

Styrene-alkyd resin copolymer. P. E. Marling. *U. S. 2,606,161.* A relatively low molecular weight oil modified alkyd is produced by replacing a large proportion of the phthalic anhydride by benzoic acid. When this alkyd is copolymerized with styrene a clear product is formed. With added drier films dry hard and are much less soluble in xylene than a regular styrenated alkyd.

Making homogeneous dispersions of polymers in drying oils. W. A. Henson and F. G. Edwards. *U. S. 2,606,164.* It has been found that if an oil soluble emulsifying agent is incorporated in a drying oil, a latex of a vinyl polymer can be dispersed in the oil to give a water in oil dispersion. Dried films of the dispersion have much greater tensile strength than films of the original oil. The optimum amounts of dispersed polymer in oil is generally from 15 to 35 parts per 100 parts of oil. The types of polymers which are useful are: styrene-butadiene; vinylidene chloride-acrylonitrile; vinyl chloride-vinylidene chloride and others.

Interpolymers of styrene and mixed esters of polyhydric alcohol and drying oil acid in the presence of a terpene. L. E. Wakeford and D. H. Hewitt. *U. S. 2,607,749.* Dehydrated castor oil is thermally polymerized prior to reacting with styrene. The range of viscosity of polymerized oil is from 7 to 100 poises at 25°C. The copolymerization with styrene is carried out in xylene solution containing 50% or more of a terpene such as dipentene or turpentine. The products are clear and free of incompatible polymer.

Production of superbodied oils. J. A. Arvin. *U. S. 2,607,784.* Linseed oil (8,000 pts.) is bodied at 600°F. with a catalyst such as anthraquinone. A CO$_2$ atmosphere is maintained and SO$_2$ bled into the oil. At the end of the two hours the viscosity is between 25 and 35 minutes (time for bubble to travel length of Gardner Viscosity tube at 77°F.). Water is sprayed on batch to cause a steam blow and the temperature reduced to 500°F. At this temperature it is further blown with SO$_2$ in a CO$_2$ atmosphere. At the point of incipient gelation 250 parts of linseed fatty acids is added and the batch cooled below bodying temperature. The cooled oil has a viscosity of one hour and is free of gel particles.

Surface coating material. D. Aelony. *U. S. 2,608,538.* A phenol-formaldehyde resin is esterified with soybean oil fatty acids to give a resin ester. When the resin ester is blended in mineral spirits with rosin esters and drier added a varnish is obtained. Films of the varnish dry tack-free in 3 to 6 hours. The dried film is hard, flexible and resistant to water and alkali.

Production of polyesters from 4-vinylcyclohexene dioxide and coating compositions containing them. *Brit. 662,365.* 4-Vinylcyclohexene dioxide or tetra-ol is treated in presence of a basic catalyst, e.g., *trimethylbenzylammonium hydroxide, preferably* in equimolar proportions with a drying or non-drying oil and with or without phthalic anhydride. (*Brit. Abs.* BII, 561 [1952])

• Waxes

E. F. Guttenberg, Abstractor

Properties of the principal fats, fatty oils, waxes, fatty acids, and their salts. M. P. Doss. New York: Texas Co., 1952. 244 pp. (*Chem. Abs.* **46**, 6854)

Wax emulsions and emulsion waxes. C. Ludecke. *Fette u. Seifen* **53**, 683-8(1951). A review. (*Chem. Abs.* **46**, 6854)

Isolation of some constituents of the wax from Arbutus unedo. Antoine Sosa. *Comptes rendus hebdomadaires des seances de l'academie des sciences* **230**, 995-7(1950); cf. C.A. **42**, 3028d. From hot alcohol extraction of leaves or stems of *Arbutus unedo* deposits on cooling a greenish waxy product (I) containing hydrocarbons, higher aliphatic alcohols, triterpenic acids, sterols, chlorophyll, yellow lipoid pigments, etc. The I from 682 grams leaves gave 12 grams colorless, waxy substance which recrystallized from EtOH and then EtOAc yielded 1.35 grams white waxy solid (II), melting at 74°. II (1.3 grams) dissolved in 65 cubic centimeters C_6H_6, chromatographed on 12 grams Al_2O_3 number 2, the column washed with C_6H_6, a 1:1:1 mixture of C_6H_6, Me_2CO, and Et_2O, and finally with a 1:1:1 Me_2CO-$CHCl_3$-EtOH mixture gave 3 fractions: 0.762 gram, melting at 67° (III); 0.165 gram, melting at 78° (IV); and 0.024 gram, melting at 79-80° (V). III recrystallized from C_6H_6-Me_2CO and then from C_6H_6-Me_2CO-MeOH gave $C_{31}H_{64}$, melting at 69°. IV and V recrystallized from C_6H_6-Me_2CO gave $C_{30}H_{61}OH$, melting at 86°, and on acetylation in pyridine an acetate, melting at 74-5°. Treatment of the Al_2O_3 column with hot EtOH and active C treatment gave 100 milligrams $C_{32}H_{65}OH$, melting at 89° (from C_6H_6-EtOH-Me_2CO), acetate, melting at 76-7°. The alcoholic mother liquor from II deposits, on standing, needles, melting at 280° which were several times recrystallized to give 0.035 gram, ursolic acid (VI) $C_{29}H_{46}$-$(OH)CO_2H$, melting at 290°, monoacetyl derivative, melting at 300°. VI is also obtained directly from I by recrystallization from EtOH and chromatography on Al_2O_3 number 3 from 4:1 $CHCl_3$-C_6H_6 mixture. A solution of 3.7 grams wax, melting at 79° (isolated from the alcoholic extract of 2 kg. stems) in C_6H_6 chromatographed on Al_2O_3 number 2 gave 1.520 grams $C_{31}H_{64}$; the column was washed with C_6H_6-$CHCl_3$EtOH and Me_2CO-Et_2O, and treated with a hot EtOH-C_6H_6-$CHCl_3$ mixture to give $C_{29}H_{59}OH$, melting at 84°, acetate, melting at 69°. (*Chem. Abs.* **46**, 6853)

Wool wax. F. Gieser. *Fette und Seifen* **54**, 92-5(1952). A review. (*Chem. Abs.* **46**, 7345)

Plasticity of waxes and its dependence on temperature. G. von Rosenberg. *Fette und Seifen* **54**, 17-21(1952). An apparatus is described for the measurement of the flow point of waxes in terms of kilograms per square centimeter. Temperature-flow point curves are given for various paraffins, natural waxes and synthetic waxes. (*Chem. Abs.* **46**, 7345)

(Analysis of) Coatings. T. G. Rochow and R. W. Stafford. *Analytical Chemistry*, **24**, 232-237 (1952). Fourth annual review of recent literature on physical and chemical methods of analyzing organic materials used as coatings, covering polymers, plasticizers, pigments, resins, oils and waxes, and specific constituents. 158 references. (*British Abstracts C*, July, 1952, 305)

SINITIRO KAWAMURA

Composition and crystals of dibasic acids of Japan wax. Kiyoshi Kurita and Tsunetarô Katô (Kyushu Univ., Fukuoka). *J. Chem. Soc. Japan*, Ind. Chem. Sect. **55**, 389-91(1952). The dibasic acids were purified by fractional crystallization and molecular distillation to give crystalline $C_{22}H_{42}O_4$ and a lower homolog, which owing to the low percentage could not be isolated.

PATENTS

Refining waxes. J. J. Naugle. *British 665,157.* Waxes, especially beeswax, are refined, e.g., for use in candles, by heating with 1-10% of an acid-activated alkaline-earth mineral (I) for 10-60 minutes at 200-300°F. 10-25 lb. per sq. in. Preferably, I is montmorillonite containing some montronite and saponite activated by treatment with HCl to give pH $\sim$ 4. It is added to the molten wax while the mixture is agitated mechanically and steam and air are passed through it. If a constant burning wax is desired the mixture also contains $\ngtr$ 1% of MgO, activated by calcination. [*Brit. Abs.* **BII**, May, 538 (1952)]

Peelable protective coating. H. E. Smith (to Insl-X Corp.). *U. S. 2,543,557.* A peelable coating for protection of machine parts comprises a composition containing lanolin 8-20, polyEt methacrylate 33-67, and fatty acid amide 33-44%, which is applied at 150° and solidifies at 90°. [*Brit. Abs.* **BII**, May, 564(1952)]

Improvement in Japan wax making. Yujiro Yoshiwara. *Japanese 1309('50).* Wax-containing seeds and bentonite or acid clay are piled up in layers in an extractor in order to extract and decolorize at the same time. (*Chem. Abs.* **46**, 7798)

Separation of wax from wax-containing oil. Yoshimasa Togawa, *et al.* (to Nippon Mining Co.). *Japanese 854('50).* Wax-containing oil is heated above the melting point of the wax, passed into a colloid mill with an inert gas and a suitably cooled liquid which is immiscible with the wax or oil; the wax is separated by deposition on gaseous bubbles and floats on top. (*Chem. Abs.* **46**, 7798)

• Detergents

Lenore Petchaft, Abstractor

Determination of sodium oleate in dilute aqueous solutions. J. Glazer and T. D. Smith. *Nature* **169**, 497(1952). Na oleate (I) in concentrations of 10^{-3} and 10^{-4} M was determined by two methods: (a) Titration of a mixture of aqueous cetyl trimethyl ammonium bromide and $CHCl_3$ with solutions of I at pH 10. Near the end point aqueous methylene blue was added as indicator and the titration continued until the intensity of color was the same in both the aqueous and organic phases. (b) A known volume of soap solution spread on a continuous-recording surface balance, containing a 25% $(NH_4)_2SO_4$ solution 0.01 N with H_2SO_4, formed a collapse area owing to the oleic acid monolayer, from which the concentration of I was determined. (*Chem. Abs.* **46**, 6998)

Change in form of soap micelles. H. Thiele (Univ. Kiel, Ger.). *Kolloid-Z.* **125**, 31-2(1952). Soap solutions, prepared by solution of soap in water on a water bath, followed by gradual cooling, may show positive or negative streaming double refraction. The sign of the streaming double refraction can be changed at will; adding alkali or acid raises or lowers the dissociation of COOH groups of the fatty acids and effects thereby a change in micelle form. The change in double refraction is reversible and is accompanied by changes in viscosity, turbidity, spinnability, and frothing capacity. Negative double refracting soap sols (acid) have predominantly plateletlike micelles, whereas the positive double refracting sols (alkaline) have threadlike micelles, as indicated by ultramicroscopic studies. The negative sols have low viscosity and high turbidity, and are not spinnable; positive sols have higher viscosity and lower turbidity, and are spinnable. The mechanism of the form change in soap molecules is due to the combined effects of 2 forces, van der Waals attraction forces of the paraffin chains and Coulomb repulsion forces of the COOH groups. (*Chem. Abs.* **46**, 6463)

Deposition of soiling matter from some detergent systems. I. Aqueous systems. R. E. Wagg (British Launderers' Research Association, London, Eng.). *J. Textile Inst.* **43**, T325-30((1952). The abilities of several synthetic detergents, alone and in the presence of certain additives, to prevent deposition of soiling matter on to clean cotton fabric have been determined, and compared with that of a typical soap under similar conditions. None of the detergents alone was as effective as soap, but could be improved to varying degrees by the addition of CMC, in one instance reaching the effectiveness of soap. The use of sodium carbonate as the alkali caused more deposition than did sodium metasilicate from solutions of synthetic detergents, as did sodium chloride, though to a smaller extent. Addition of CMC to the sodium carbonate/detergent mixtures overcame to some extent, but usually not completely, the increased deposition caused by the sodium carbonate.

Further inquiry into the antibacterial properties of cationic and anionic detergents. B. H. Johnson, Hoyo Migaki and E. C. McCulloch (Univ. of Oregon Medical School, Portland, Ore.). *Am. J. Public Health* **42**, 801-5(1952). A report is made of a comparative study of an in vitro and in vivo technic for evaluation of the disinfectant efficiency of a cationic (Hyamine 1622) and an anionic (Tide) detergent in an attempt to determine whether survivors of an exposure to these agents displayed reduction in infectivity; whether postulated aggregates of survivors would be detoxified and "reviewed" following introduction into the animal body. Conclusive evidence could not be found to prove or disprove any reduction in infectivity of surviving exposed organisms.

Modern glass cleaners. M. A. Lesser. *Soap, Sanitary Chemicals* **28**, No. 9, 46-9, 105-6(1952). Review of various types of glass cleaners such as abrasive type, cake polishes, "Glass Wax" type, alcohol type, pastes, and new spray and antimist compounds. Formulations are included.

The Twitchell process. J. H. Wigner. *Soap, Perfumery, Cosmetics* **25**, 955-60, 962(1952). Review of the Twitchell process of fat-splitting for soap use. Details discussed include preparation of reagent, washing and splitting of the fats, process control of the reaction, saponification of the fatty acids obtained in the splitting, and sweet water treatment.

Hexachlorophene (G11) in the surgical scrub; brushless surgical wash. Hugh Cleland (Toronto General Hosp.). *Can. Med. Assoc. J.* **66**, 462-4(1952). Hexachlorophene has a lasting germicidal effect on the skin flora and was considered to be satisfactory as a brushless surgical scrub. (*Chem. Abs.* **46**, 7288)

Deposition of soiling matter from some detergent systems. II. Non-aqueous systems. R. E. Wagg. (British Launderers' Research Association, London, Eng.). *J. Textile Inst.* **43**, T331-7 (1952). The deposition of soiling matter from systems containing different solvents and additives, including water, on to wool preconditioned at different relative humidities has been studied.

SINITIRO KAWAMURA

Surface-active agent prepared from naphthalene, 2,2′binaphthyl, n-butyl alcohol, and sulfuric acid. Kazuo Fukuzumi and Yoshikuni Hirai (Nagoya Univ.). (*J. Chem. Soc. Japan*, Ind. Chem. Sect. **55**, 403-5(1952). The sulfonate mixture prepared from the 4 compounds given above and presumably consisting of dibutylnaphthalenesulfonate and tetrabutyl-2,2′-binaphthylsulfonate was a superior surface-active agent to dibutylnaphthalenesulfonate (the active ingredient of Nekal).

Surface-active compounds. V. Surface-activity of sodium salts of sulfonates of phenol alkyl esters and of phenyl alkyl ethers. Toshio Gotô and Jirô Mikumo (Nagoya Univ.). *J. Chem. Soc. Japan*, Ind. Chem. Sect. **55**, 387-9(1952). Na estersulfonates of the type, $RCOOC_6H_4SO_3Na$ ($RCO =$ lauroyl or oleoyl), and Na ethersulfonates of the type $RCH_2OC_6H_4SO_3Na$ ($RCH_2 =$ butyl, lauryl, or oleyl), were synthesized and properties such as surface tension, wetting, and acid stability were compared with those of Na oleate, Nekal, and Leonil S.

Effects of the chemical structure of surface-active agents on their emulsifying and detergent actions. I. Emulsifying actions of sodium cetyl sulfonate, sodium cetyl sulfate, and sodium palmitate. Tokuzô Yoshizaki and Haruyoshi Terashima. *J. Chem. Soc. Japan*, Ind. Chem. Sect. **55**, 350-2(1952). The emulsifying power was greatest for Na cetyl sulfate, and smallest for Na palmitate. This order is inversely parallel to the interfacial tension with the substance to be emulsified, i.e., wool fat, fatty acid, and kerosene. (For kerosene a small deviation was found in this parallelism.)

II. Detergent actions of sodium cetyl sulfonate, sodium cetyl sulfate, and sodium palmitate. *Ibid.* 445-6. In the case of washing cotton cloth, the detergent power for wool fat was in the order, Na palmitate (I) > Na cetyl sulfate (II) > Na cetyl sulfonate (III), contrary to the order for lowering of interfacial tension. The detergent power for fatty acid or kerosene was parallel to the order for lowering interfacial tension; for fatty acid, **II > III > I**, and for kerosene, **III > > II > I**. In the case of washing wool cloth, the detergent power was for all 3 soils, **II > III > I**. In general, **II** was the best.

PATENTS

Alkylaryl sulfonate-hydroxyethylcellulose detergent composition. Leslie R. Bacon and Clifton E. Smith, Thomas H. Vaughn (Wyandotte Chemicals Corp.). *U. S. 2,602,781.* Preparation of a detergent composition consisting of a sodium kerylbenzene sulfonate and from 5 to 57% of a hydroxyethylcellulose which acts as a detergent promoter or accelerator and increases detergent properties to 150-190% of standard.

Nonionic surface active agent. R. H. Kienle and G. P. Whitcomb (American Cyanamid Co.). *U. S. 2,606,199.* Preparation of a nonionic detergent by the reaction of a dimeric fatty acid and polyalkylene oxide at elevated temperature in the presence of a small amount of an esterification catalyst.

Liquid anionic-dialkylolamide detergent composition. P. T. Vitale and R. S. Leonard (Colgate-Palmolive-Peet Co.). *U. S. 2,607,740.* Preparation of a liquid synthetic detergent by mixing lauroyl diethanolamide and anionic detergent base containing triethanolamine salt of dodecyl benzene sulfonate and triethanolamine sulfate, water, and ethyl alcohol.

Detergent compositions containing amino-coumarins. Franz Ackermann (Ciba Ltd.). *U. S. 2,610,152.* A detergent composition consisting essentially of a water-soluble, synthetic, organic, anion-active detergent selected from the group consisting of water-soluble soaps and synthetic, organic, non-soap, anion-active sulfonated detergents improved with a whitening agent consisting of an amino coumarin compound.

Skin cleaning composition. Leonard L. McKinney and John C. Cowan (Secretary of Agriculture). *U. S. 2,610,153.* A skin cleaning composition comprising a formaldehyde-treated dried meal obtained from the extraction of oil from soybeans as the abrasive element combined with a fatty acid soap and necessary builders.

Soap manufacture. Lever Brothers & Unilever Ltd. *Brit. 662,648.* A process is provided for separating neat soap during the finishing operation by centrifuging. If water is added to the soap mass so that the total fatty acid content will be 40-60%, such a mass can be circulated and maintained in a homogeneous state. A continuous stream of this mass is withdrawn and mixed with a stream of electrolyte so proportioned as to cause a neat soap phase to be formed. The soap content of this mixed stream should be 38-62% and its temperature 180°F. The neat soap is separated by centrifuging the mixture. (*Chem. Abs.* **46**, 8399)

Improvements in methods of and apparatus for cleaning soiled articles. (Lever Brothers & Unilever Ltd.) *Brit. 664,502.* A method of cleaning soiled articles by contacting a cleaning liquid, containing detergents or solvents, with the soiled articles in the presence of compressional wave energy of supersonic frequency.

Detergent. H. G. Gerber, C. Wegner, K. Hintzmann and M. Quaedvlieg (Farbenfabriken Bayer). *Ger. 836,983.* The detergent activity of sodium salts of higher aliphatic sulfonic acids is increased by the addition of primary amines having a hydrocarbon radical containing at least 4 carbon atoms such as hexamethylene diamine, cyclohexylamine, etc.