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

• Oils and Fats

Ralph W. Planck, Abstractor
Dorothy M. Rathmann, Abstractor

The taste of buttermilk. H. Mulder, J. W. Menger, P. Tiersma, and A. Adamse (Agr. Univ., Wageningen, Netherlands). *Proc. 13th Intern. Dairy Congr.* (Hague) 2, 486-8(1953). The taste of buttermilk may be caused by oxidized lecithin from the fat membrane broken off during churning. The intensity of the flavor increases with the fat content of the cream used for churning. The addition of hydroquinone or ascorbic acid to the cream prevents development of the flavor because of their antioxygenic action. The relation of the ascorbic acid content of the cream and development of the oxidized flavor is given. (*C. A.* 48, 4137)

The iodine value of milk during different parts of the year and its influence on the quality of the butter. T. Bergman and Kr. Joost (Swedish Dairy Assoc., Stockholm). *Proc. 13th Intern. Dairy Congr.* (Hague) 2, 89-92(1953). A formula is given to determine I no. from *n*, the average error being 2.2% and the maximum 4%. The I no. influences the consistency of the butter. Milk fat with an I no. of 33-34 is ideal. An I no. within 31-37, while not ideal, does not affect the consistency too much, but an iodine value of <30 or >38 gives poor consistency; the greater the trend above or below these values the greater its effects. (*C. A.* 48, 4136)

Churning in the absence of foam. H. Mulder and J. G. Schols (Agr. Univ., Wageningen, Netherlands). *Proc. 13 Intern. Dairy Congr.* (Hague) 2, 706-9(1953). It is generally believed that a cream-air boundary is essential to churning. Butter has been churned in the absence of air. Data are given to show the churning time in minutes with a Holstein churn, r.p.m. of the agitator, and the percentage of fat in the cream. A new type of churn is also described. (*C. A.* 48, 4141)

Stability of vitamin A and carotene in butter. M. Antila (Helsinki Univ.). *Proc. 13th Intern. Dairy Congr.* (Hague) 3, 1439-42(1953). Butter prepared in a number of ways showed very little loss of these compounds on storage although the pH varied from 4.8 to 6.8. (*C. A.* 48, 4141)

The manufacture of aromatic butter. III. N. Evenhuis (Coop. Milk Products Factory, Bedum, Holland). *Neth. Milk Dairy J.* 7, 240-5(1953). A sufficient formation of diacetyl in butter is obtained if the starter is shaken with about 0.1 of the volume of air used to churn cream in an ordinary churn. Reduction of the pressure to about 140 mm. Hg during the shaking of the starter also gives a satisfactory formation of diacetyl. (*C. A.* 48, 4141)

Sheep-milk butter. Enrico Macciotta and Pasquale Manninroni. *Boll. lab. chim. provinciali* (Bologna) 4, 37-40(1953). Analysis of sheep-milk butter of various origins gave the following average values for butter-fat contents: water, 14%; fat, 86%; Zeiss index at 35°, 46; Reichert-Meissl no., 30; Polenské no., 6; Lucentini-Drago no., 22; Tortelli-Jaffee test, positive. The Tortelli-Jaffee test was also positive on butterfat extracted from cheese made from sheep milk. Since this test is attributed to ergosterol present in fish oils, a test was made on the unsaponified material of sheep-milk butterfat and proved positive, whereas the same test on the cow-milk butterfat was negative. Therefore, the Tortelli-Jaffee test can be used to differentiate sheep milk from cow milk. (*C. A.* 48, 4142)

The problem of fishiness in butter. P. Munro and C. R. Barnicoat (Massy Agr. College, Palmerston North, N. Z.). *J. Dairy Research* 20, 274-9(1953). Chemical factors reputed to promote fishiness in butter were studied. Attempts were made to reproduce fishiness in experimental churnings of butter by deliberately applying factors reputed to cause the defect, viz. low pH, high salt content, lack of pasteurization, traces of copper, borates, singly and in combination. After storage at 60-65°F. for 1-5 months, the butters developed various off-flavors — cheesy, tallowy, metallic, storage — but in no case was fishiness observed. At no stage were significant amounts of trimethylamine detected, nor of trimethylamine oxide, though the butterfats were considerably oxidized. The nature of fishiness is discussed. It is clear that chemical theories cannot adequately account for the development of this defect in butter. (*C. A.* 48, 4141)

Manurial value of groundnut and castor oilcakes for important food and cash crops in Hyderabad State. Anon. *Oils & Oilseeds J.* 6(4), 12(1953). According to pamphlet No. 36, published by the Central Oilseeds Committee, peanut and castor meals have been shown to be good fertilizers for wheat, rice, cotton, sugar cane, and tobacco. On N basis, these meals were as effective as farm manure or $(NH_4)_2SO_4$.

Cold-storage experiments on butter. F. E. van Haeften and J. W. Pette (Netherlands Inst. Dairy Research, Hoorn). *Proc. 13th Intern. Dairy Congr.* (Hague) 2, 541-4(1953). Summer and winter butters were studied. Organoleptic evaluation, I no., peroxide no., fuchsin test for aliphatic carbonyl groups, and Kreis test were made. Samples were prepared containing no salt, salt, and Cu. High-temperature (90°) and low-temperature (70-72°) pasteurization were used. The acid nos. remained practically the same. Peroxide values above 1 correlated with organoleptic tests. Fuchsin tests when positive correlated with organoleptic tests. Butter made from high-temperature pasteurized cream kept best. Salted butter generally showed a lower peroxide no. than unsalted. Added Cu caused the development of a "fishy" flavor. Summer butters were more stable than winter. Prevention of cold storage defects was attempted by addition of killed yeast cultures, antioxidants, washing with H_2O, and addition of sterilized milk to the cream. The addition of killed yeast, sterilized milk, dodecyl gallate and nordihydroguaiaretic acid, lecithin, and carboxymethylcellulose had no beneficial effect. Tetraethylthiuram disulfide and tetramethylthiuram disulfide had a beneficial effect. Irradiation with ultraviolet light did not cause a fishy flavor but rather a linseed-oil flavor. Oxidation experiments were made on lecithin-free butterfat at 37°, 14°, and 10°. (*C. A.* 48, 4140-1)

The correlation between butterfat and protein. O. Stuber (Bundeslehr- u. Versuchsanstalt Hartkäserei, Rotholz, Austria). *Proc. 13th Intern. Dairy Congr.* (Hague) 2, 301-9(1953). There is a certain relation between the butterfat and protein content of the milk but it fluctuates considerably. Therefore, determination of the butterfat is not a good enough indication of the protein content to eliminate the determination of the latter. (*C. A.* 48, 4140)

Problems in the manufacture of butter from the milk of Jersey cows. A. H. Pederson (Govt. Exptl. Dairy, Hillerod, Denmark). *Proc. 13th Intern. Dairy Congr.* (Hague) 2, 108-11 (1953). The I no. of butterfat from Jersey cow milk is 4.0-6.0 below that of the Red Danish breed. Butter from Jersey milk is too hard and crumbly in winter. The Jersey can synthesize a greater part of the fat from carbohydrate than the Red Danish. The method of manufacturing can be improved. The feeding of rape and soybean oil raises the I no. of the Jersey butterfat. (*C. A.* 48, 4140)

Changes in the quality of butter during storage. K. E. Thomé (State Dairy Research Sta., Alnarp, Sweden). *Proc. 13th Intern. Dairy Congr.* (Hague) 2, 499-506(1953). A review and discussion of the chemical and microbiological changes which occur during storage. Storage below —15° stops microbial and retards chemical changes. The effect of salt on these changes is discussed. Neutralization is the most effective method of preventing oxidative defects. As little as 0.05 p.p.m. Cu has a proöxidative effect. This figure lies near the normal concentration of Cu in milk. 56 references. (*C. A.* 48, 4140)

Oxidation phenomena encountered in the manufacture of butter in cheese dairies. W. Ritter (Milchw. u. Bakteriol. Anstalt, Liebefeld-Bern, Switzerland). *Proc. 13th Intern. Dairy Congr.* (Hague) 2, 512-16(1953). Butter made from whey cream is high in Cu and as a result almost always develops a fishy flavor on storage. Experiments made to eliminate the Cu in the cream and butter have been unsuccessful. Biological methods of elimination are now being tried. The best quality cheese-dairy is made from sweet and well-pasteurized cream. (*C. A.* 48, 4140)

Five-year plan for the production of oilseeds. Balkanization of resources. Shiv Dhyan Singh Chauhan. *Oils and Oilseeds J.* 6(8), 8-9(1954). Statistics and planning for the production of oilseeds in India have been incomplete because of the failure of the Planning Commission and the Central Oilseeds Committee to consider as oilseeds cottonseed, coconuts, neem, mahua, nigerseed and others. The present Indian oil shortage could be alleviated, in part, by planting oilseeds like neem, mahua, and coconut along roads and on waste land and by utilizing more completely cottonseed and oilseeds that grow wild. Estimated tonnages of seeds not harvested each year are: neem, 52,450; pungam, 74,830; mahua, 1,900; and pinnai, 500.

Determinations of the fat content of brisling, 1949-1950, 1951, 1952. *Tidsskr. Hermetikind.* **37**, 73-6, 79-82(1951); **38**, 376-8, 381, 382, 385, 387(1952); **39**, 175-80(1953). Fat analyses were carried out at 4 Norwegian laboratories. Results are tabulated according to the area where the fish were caught.

Studies on the stability of safflower-seed oil. M. N. Rao and M. Swaminathan. *Bull. cent. Food Tech. Research Inst., Mysore,* **2**, 211(1953). The stability of crude safflower-seed oil, which was stored in aluminum, tinned brass, and glass vessels at room temperature (25-35°), was compared with that of groundnut oil under similar conditions. The peroxide nos. of the oils were determined at intervals of 15 days over a period of 3 months. Safflower-seed oil was less stable than groundnut oil, and was considerably less stable in aluminum and tinned brass than in glass vessels. It is readily susceptible to oxidative rancidity, possibly owing to its drying properties. The low stability may also be due to the high content of glycerides of linoleic acid. (*Food Sci. Abstracts* **26**[1], 45 [1954])

Raising agents in margarine used as shortening. H. Hennecke and F. Lamprecht. *Brot u. Gebäck* **5**, 129-130(1951). The properties of a German raising agent, Beropin, which is added to margarine used in preparing raised dough, are described. The active component is stated to be citraconic acid. Beropin is used in amounts of 80-90 mg. per kg. of margarine. Excellent results are claimed. (*Food Sci. Abstracts* **26**[1], 45 [1954])

Food industries associations in India. I. Oil milling industry. B. K. Sur and G. T. Kale, *Bull. Cent. Food Research Inst., Mysore* **2**, 213-9(1953). An account of the formation and activities of associations concerned with the oil milling industry.

Contribution to an elucidation of the mechanism of action of ascorbic acid used as an antioxidant in frozen fish. T. Thorsteinsson. *Fiskeriminist. Forsøgslab., Copenhagen, Medd. 1952,* 31 pp. Dipping fish in 1-2% ascorbic acid solutions delays rancidity. Peroxide formation in fish oil is of enzymic nature.

The determination of total fat, milk fat, and egg content in baked goods and dietetic foods. H. Hadorn and R. Jungkunz. *Mitt. Lebensmitteluntersuch. Hyg., Bern* **43**, 197-200(1952). Baked goods of known composition were used for analysis. Ether extraction alone gave low values. Better results were obtained by the method of Grossfield (*Z. Untersuch. Lebensmitt.* **74**, 284 [1937]) and the international method as used by the cocoa industry (*Pharm. Acta Helv.* **13**, 146[1938]). Acid hydrolysis did not affect the results for milk fat or cholesterol. After acid hydrolysis, the fat, milk fat, and egg contents of dietetic and infant foods were successfully determined by the international method. (*Food Sci. Abstracts* **26**[1], 102 [1954])

Organoleptic examination of edible oils and fats. P. Balavoine. *Mitt. Lebensuntersuch. Hyg., Bern* **43**, 521-3(1952). The Kreis reaction for aldehydic rancidity should be carried out with resorcinol, and not with phloroglucinol. A negative Kreis reaction does not rule out poor quality, and organoleptic evaluation may have to be relied upon. (*Food Sci. Abstracts* **26**[1], 50 [1952])

A new color reaction for keto acids and other carbonyl compounds. Zacharias Dische, Rudolf Wekl, and Edith Landsberg (Columbia University, New York, N. Y.). *J. Biol. Chem.* **208**, 23-28(1954). New color reaction of α-keto acids, α-keto- and hydroxyaldehydes with α-methylindole and HCl are described. The application of these reactions for the detection and quantitative determination of these substances is discussed.

Measurement of butyric acid in fat with reference to the detection of substitute fats in dairy products. W. J. Harper and T. W. Armstrong (The Ohio State Univ., Columbus). *J. Dairy Sci.* **37**, 481-7(1954). A method is presented for the rapid direct chromatographic determination of the molar concentration of butyric acid in the fat of dairy products which may be utilized as a means of detecting fat substitution in dairy products. This method has the advantage of being readily adaptable to rapid routine analyses. The butyric acid content of 26 commercial vanilla ice creams varied between 9.5 and 10.7%. Sixty percent of the butyric acid values were above 10.0%, and 95% of the values were 9.6%, or higher. Chocolate ice cream had a butyric acid content ranging from 7.3 to 9.1%. Substitution of fat in ice cream may be detected readily at the 10% level for both vegetable and animal fats. However, the amount of fat substituted may be estimated only semi-quantitatively. The error involved in estimating the percent substitution was as high as 50% but averaged 14%. When the source of substitute fat or the butyric acid content of this milk fat is unknown, the amount of substitution cannot be determined.

The reaction of methyl linoleate and methyl linolelaidate with di-t-butyl peroxide. S. A. Harrison and D. H. Wheeler (General Mills, Inc., Minneapolis, Minn.). *J. Am. Chem. Soc.* **76**, 2379-82(1954). The reaction of methyl linoleate and methyl linolelaidate with di-*t*-butyl peroxide at 125° has been studied. It was found that the products were largely the dehydro dimers of the fatty esters. The dimer from each fatty ester was found to be a mixture of isomers differing in the number of conjugated double bonds and in the *cis, trans* configuration of the double bonds.

The infrared spectra of gossypol. R. T. O'Connor, P. Von der Haar, E. F. DuPre, L. E. Brown and C. H. Pominski (Southern Regional Research Lab., New Orleans, La.). *J. Am. Chem. Soc.* **76**, 2368-73(1954). Infrared spectra of chloroform solutions of gossypol, 13 derivatives and degradation products of gossypol, and 18 "model" compounds containing groupings present in the gossypol molecule, have been obtained in the region of 2 to 12 *u*. From wave length positions of observed maxima, correlations have been made with vibrating groups giving rise to the most prominent bands in the spectra. The infrared spectra confirm the fact that gossypol is an aromatic and phenolic compound. Correlation also confirms the presence of a carbonyl *ortho* to a hydroxyl group and in some derivatives of gossypol the presence of no carbonyl groups, and of carbonyl groups attached directly to an alicyclic grouping in others. The infrared spectra thus strongly support the chemical evidence that gossypol occurs in tautomeric forms. These observations are in agreement with the accepted structure of the gossypol molecule.

The peracid oxidation of linoleic acid. A. F. McKay, N. Levitin and R. N. Jones. *J. Am. Chem. Soc.* **76**, 2383-6(1954). This is a preliminary report on the peracetic and performic acid oxidations of α-linoleic acid. Two new oxidation products have been isolated and partially characterized. It has been established that the isomeric sativic acids derived from the oxidation of α-linoleic acid are readily separated through their methyl esters. This procedure eliminates the difficulties experienced with the separation of the free acids, which is caused by the formation of eutectic mixtures. The oily by-products from the oxidation of linoleic acid have been demonstrated to have relatively low acid equivalents of 300-400.

Food rancidity. Studies on deterioration of walnut meats. D. D. Musco and W. V. Cruess. (Univ. of California, Berkeley). *J. Agr. and Food Chem.* **2**, 520-3(1954). Rapid deterioration in flavor often shortens the shelf life of walnuts in shelled form. A study of factors affecting such deterioration and the value of antioxidants in retarding it showed that deterioration in flavor and odor was accompanied by increase in peroxide and Kreis values, although correlation was not always close. A satisfactory method of determining the peroxide value without expressing the oil was devised. Blanching at 100°C. greatly increased the rate of peroxide formation. Lipase appeared to be present and active. Peroxide and Kreis values increased many times faster in oil stored as such than in the meats. Butylated hydroxyanisole proved more effective in retarding rancidification than did nordihydroguaiaretic acid, propyl gallate, and antioxidant salt. Light greatly hastened deterioration. Most of the deterioration is oxidative, although hydrolytic changes may also be involved. Lightproof packaging is desirable. If air is in contact with the meats, an effective antioxidant should be used for long shelf life. Packing under vacuum in cans or jars is the alternative.

Separations of soy bean inositide fractions of low partition coefficient. C. R. Scholfield and H. J. Dutton (Northern Research Lab., Peoria, Illinois). *J. Biol. Chem.* **208**, 461-9(1954). It has previously been shown that the alcohol-insoluble portion of soy bean phosphatides can be separated into two inositol-containing fractions by counter-current distribution between hexane and 95 percent methanol. It has now been shown that the fraction of low partition coefficient contains phosphatidyl ethanolamine and a nitrogen-free, inositol-containing phosphatide. These can be separated by precipitation of the inositide from chloroform solution with methanol or more efficiently by precipitation of the inositide from a dilute methanol solution with lead acetate.

Determination of aldehydes in the presence of ketones. H. Siegel and F. T. Weiss (Shell Development Co., Emeryville, Calif.). *Anal. Chem.* **26**, 917-8(1954). The argentimetric method published a number of years ago by Ponndorf, after suitable modification, has provided a safe, rapid, and reliable method for the determination of aldehydes. The Ponndorf method involves the reaction of aldehyde with silver oxide, formed *in situ* by addition of sodium hydroxide to the aqueous or alcoholic reaction mixture containing dilute silver nitrate. No side reactions—such as the Cannizzaro reaction of aldol condensation—are expected, since the reaction mixture is kept dilute with respect to the sample and is made strongly basic only in the last stages of oxidation. The unreduced silver ion is determined in the filtered reaction mixture, after acidification to redissolve silver oxide. A number of modifications have been introduced in Ponndorf's method to make it more rapid and convenient, including final titration with thiocyanate reagent according to Volhard.

Determination of epoxides with sodium sulfite. J. D. Swan (Jefferson Chemical Co., Austin Laboratories, Austin, Texas). *Anal. Chem.* **26**, 878-80(1954). This investigation was undertaken to provide one method of determination applicable to epoxides in general, and the described procedure has proved satisfactory for several aliphatic compounds containing the oxirane ring. The described procedure has the advantage of permitting the analysis of dilute aqueous solutions of epoxides as well as epoxide-glycol mixtures. Accuracy of the analysis has been ±0.5% or better in all cases. The analysis is based on the reaction of the epoxide ring with sodium sulfite to liberate sodium hydroxide which is titrated with standard hydrochloric acid. Many aldehydes also react with sodium sulfite releasing caustic; a procedure for determining epoxide-aldehyde mixtures is described.

Assignment of the olefinic position in unsaturated acids by means of the iodolactonization reaction. Eugene van Tamelen and Maurice Shamma (Univ. of Wisconsin, Madison). *J. Am. Chem. Soc.* **76**, 2315-7(1954). By means of infrared spectrophotometric methods certain β,γ- and γ,δ-unsaturated acids have been shown to yield five-membered iodolactones on treatment with iodine—potassium iodide in bicarbonate solution at room temperature. The single δ,ϵ-unsaturated acid studied, δ,ϵ-hexenoic acid, yields (probably) δ-iodomethyl-δ-valerolactone, whereas acids with double bonds farther removed from the carboxyl lead to unstable, poorly-defined products.

Crystalline triacetin. F. J. Baur (The Procter and Gamble Co.). *J. Phys. Chem.* **58**, 380(1954). Commercial C. P. grade triacetin or the compound purified by fractional distillation is readily crystallized by storage of liquid triacetin or a 50% solution in 90% ethanol for several days at −18°. Crystalline triacetin melts at 4.1° (corr.). X-Ray diffraction data are summarized.

Dissolved air flotation. Anon. *Food Processing* **15**, No. 5, 30 (1954). Lever Brothers recovers 400 lbs. of grease per day and solves disposal problem of waste from deodorizers and fatty acid stills. Solution consists of dissolving air under pressure in waste water, then releasing pressure to cause small bubbles to carry fat to the surface.

PATENTS

Synergistic antioxidants containing antioxidant acids. Lloyd A. Hall (The Griffith Labs., Inc.). *U. S. 2,677,616.* A procedure for the preparation of lecithin citrate is described. The product is used as an antioxidant for edible oils.

Phosphatide preparations. Albert Scharf (Erwin Scharf, executor; American Lecithin Co., Inc.). *U. S. 2,678,320.* A mixture of phosphatide and 1 to 3 parts by weight of sulfonated fatty glyceride (sulfonated castor oil) is heated for 1 to 6 hrs. at 50 to 150°C., until the mixture gives a hazy solution in water. The mixture is diluted with water and cleared by the addition of a glycol.

Alkali refining of fatty glycerides in the presence of a tartaric compound. John A. Carlson (Lever Bros. Co.). *U. S. 2,678,325.* Refining losses are reduced by adding a small amount of tartaric acid (up to 0.75% by weight of oil) at any stage during the alkali refining of a degummed or non-degummed fatty glyceride.

Method of refining oils with polycarboxylic acids. Norbert W. Zeils (Lever Bros. Co.). *U. S. 2,678,326.* Refining losses are reduced by adding a fraction of 1% of an aliphatic polycarboxylic acid (on an anhydrous weight basis) to the oil at any stage in alkali-refining.

Process of treating glyceride oils. Benjamin Clayton. *U. S. 2,678,327.* Crude glyceride oil is treated with an aqueous degumming agent. The hydrated gum is separated, dispersed in a liquefied hydrocarbon, and the mixture is heated under pressure until phase separation occurs. The aqueous phase containing gums is separated from the hydrocarbon phase containing oil. The hydrocarbon is removed from the recovered oil by distillation.

Method of making glyceride-fumaric acid reaction products. Oliver J. Grummitt (The Sherwin-Williams Co.). *U. S. 2,678,934.* A mixture of an aliphatic, nonconjugated, polyunsaturated oil and fumaric acid and 0.1 to 2% by weight of free halogen is heated to 175-300°C. until desired reaction occurs. Products may similarly be prepared from fumaric anhydride, esters or half esters of fumaric acid, salts of fumaric acid or its esters, or amides of fumaric acid.

Process for polyoxyethylation of nonhydroxyl containing esters. Robert L. Sundberg and Max E. Chiddix (General Aniline & Film Corp.). *U. S. 2,678,935.* Fatty acid glycerides which contain no free hydroxyl groups are condensed with alkylene oxide by heating the mixture in the presence of an alkaline catalyst and a small amount of substances containing reactive hydrogen atoms.

Method of refining vegetable and animal oils. Ivar Axel Afzelius and Hans Olof Lindgren (Aktiebolaget Separator, Stockholm). *U. S. 2,678,936.* In a continuous process for refining oil, the oil is first mixed thoroughly with a quantity of strong lye insufficient to neutralize all of the free fatty acids. The mixture is centrifuged. The oil phase is then mixed with sufficient lye to complete the neutralization of fatty acids and acid soaps and to precipitate pigments and slimy materials. Refined oil is obtained by centrifuging.

Destearinization of glyceride oils. Elmer W. Brennan, Paul R. Chapman and George Wolfram (The Pure Oil Co.). *U. S. 2,678,937.* A solution of oil in a selective solvent is chilled to a temperature not below +5°F. until a substantial proportion of the saturated, high melting glycerides have precipitated. The temperature is then lowered at least 15° and the mixture is aged until precipitation of saturated glycerides is completed. The precipitate is removed. Solvent is distilled from the oil. The oil so obtained has a decreased A.S.T.M. pour point.

• Biology and Nutrition

F. A. Kummerow, Abstractor
Joseph McLaughlin, Jr., Abstractor

Some aspects of the chemistry and biochemistry of cholesterol. Louis F. Fieser (Harvard Univ., Cambridge, Mass.). *Science* **119**, 710-15(1954). Cholesterol is no minor constituent of the animal body. The total quantity of cholesterol in a man weighing 65 kg. is approximately 210 g., or 0.3 percent of the wet weight. The largest amounts are present in the skin (51 g.) and nervous tissue (35 g.); the tissue concentration varies from 0.14 percent (muscle) to 4.5 percent (adrenal gland). The sterol normally present in plasma to the extent of 0.2 percent is partly free (27 percent) and partly as esters of higher fatty acids, while that present in red blood cells (0.12 percent) and in nervous tissue (1.9 percent) is completely unesterified.

Studies on the fatty acid oxidizing system of animal tissues. VII. The B-ketoacyl coenzyme A cleavage enzyme. Dexter S. Goldman (Univ. of Wisconsin, Madison). *J. Biol. Chem.* **208**, 345-57(1954). The B-ketoacyl CoA cleavage enzyme (CE) of beef liver mitochondria has been purified about 15-fold over the initial extract of the acetone-dried powder. At the highest purity obtained, CE catalyzes the cleavage of B-keto-C_4-, C_6-, and C_8-acyl CoA at the rates of 5.9, 12.0, and 10.8 μM × min.$^{-1}$ × mg.$^{-1-}$, respectively, at 30°. The equilibrium constant for the reaction $2AcCoA \rightleftharpoons AcAcCoA + CoA$ in the direction of condensation at 16° has been determined to be 8.7×10^{-5} at pH 8.8 and 6.0×10^{-5} at pH 8.5. Km′ for three substrates of CE, B-keto-C_4-, C_6-, and C_8-acyl CoA, have been determined to be 5.5×10^{-5}, 1.5×10^{-5}, and 1.4×10^{-5} mole × liter^{-1}, respectively, at 16°. Two possible mechanisms for the action of CE are discussed in the light of recent findings. Both mechanisms assume the formation of E-Ac- as an intermediary complex. It was not possible to choose between the mechanisms on the basis of kinetic data obtained.

Fluorescence reactions of steroids. J. W. Goldzieher, J. M. Bodenchuk, and P. Nolan. *Anal. Chem.* **26**, 853-6(1954). Results indicate that the product resulting from heat treatment of the steroid in concentrated sulfuric acid, irradiated with 436-mμ light, gives maximum fluorescence in most instances. In general, the greater the number of hydroxyl groups, the greater the fluorescence energy. Steric molecular configuration affects both the characteristics and intensity of the spectrum. An aromatic A-ring greatly increases fluorescence. The data obtained permit prediction of the type of steroid from which fluorimetric methods can be developed and supply the basic data, comparable to absorption curves in colorimetry, for the development of such methods.

The effect of fasting upon tissue lipogenesis in the intact rat. T. T. Hutchens, J. T. Van Bruggen, R. M. Cockburn, and E. S. West (Univ. of Oregon Medical School, Portland, Oregon). *J. Biol. Chem.* **208**, 115-21(1954). The participation of liver, gut, carcass, and skin in the lipogenic responses of the adult male rat has been studied in animals fasted up to 240 hours. Liver lipogenic mechanisms appear to be the most susceptible to fasting, but all tissues studied showed significant decreases in the incorporation of C^{14} with extended fasting. Of the tissues studied, liver was the least active in incorporation of C^{14} during fasting. The magnitude of C^{14} incorporation into gut fractions is great, and in all probability should be considered in interpretations of tissue lipide interchanges.

Characteristics of a fatty acid oxidase from adipose tissue of the hen. Mary Morrison, Barbara McLaren and William Stadelman. (State College of Washington, Pullman). *Poultry Science* **33**, 401-6(1954). The filtered system utilized adenosine-5-phosphoric acid and adenosine triphosphate equally well, but gave a higher uptake with adenosine-5-phosphoric acid when myristic and oleic acids were used as substrates. Sodium cyanide, hydroxylamine hydrochloride and arsenite completely inhibited the oxidation. Malonate and potassium ferricyanide had no effect. Sodium azide and sodium diethyldithiocarbamate inhibited the oxidation by 80 percent. Sodium fluoroacetate inhibited the oxidation of oleic and myristic acids by 40 percent, but did not decrease the oxygen uptake of the filtered system when no substrate was added.

Biosynthesis of cholesterol and B-hydroxy-B-methylglutaric acid by extracts of liver. Joseph L. Rabinowitz and Samuel Gurin (Univ. of Pennsylvania, Philadelphia). *J. Biol Chem.* **208**, 307-13(1954). Further studies are reported upon the preparation and properties of a particle-free aqueous extract of rat liver capable of incorporating C^{14}-labeled acetate, pyruvate, and acetyl coenzyme A into cholesterol. Both 2-C^{14}-pyruvate and 1-C^{14}-acetyl coenzyme A are more efficiently utilized than is 1-C^{14}-acetate. The cholesterol biosynthesized from labeled acetate by this aqueous system has been shown to be randomly labeled. A requirement for DPN, ATP, or AMP, and CoA has been demonstrated. Carrier experiments with this enzyme system indicate that it can efficiently incorporate 1-C^{14}-acetate into B-hydroxy-B-methyl glutarate.

Isolation of radioactive cholesterol from plasma. R. S. Rosenfeld, L. Hellman, W. J. Considine, and T. F. Gallagher (Sloan-Kettering Institute for Cancer Research, New York, N. Y.). *J. Biol. Chem.* **208**, 73-83(1954). Free cholesterol and "ester" cholesterol have been isolated from plasma, and free cholesterol has been obtained from the red blood cells of humans given acetate-2-C^{14}. Isolation of these components from serum by two techniques, (a) a chromatographic separation and (b) a procedure allowing free and "ester" cholesterol to be obtained directly from the same plasma filtrate, showed no difference in radio-activity when appropriate cholesterol fractions were compared. The minimal number of purification steps necessary to obtain cholesterol of radiochemical homogeneity has been established. No highly radioactive contaminants in cholesterol of serum of red blood cells were found 6 hours after administration of acetate-2-C^{14}. A standard method for the isolation of radioactive free and "ester" cholesterol from plasma and erythrocytes has been described.

The formation of new glyceride-ester bonds during digestion of glycerides in the lumen of the small intestine of the rat. Bengt Borgström. (Univ. of Lund, Sweden). *Arch. Biochem. Biophys.* **49**, 268-275(1954). Fat mixtures containing C^{14}-labeled decanoic acid dissolved in olive oil were fed to rats and the incorporation of the acids into glycerides was studied in the different glyceride fractions (mono-, di-, and triglycerides) recovered from the small intestine contents. Decanoic acid is absorbed more rapidly than long-chain fatty acids and is utilized for synthesis of glyceride-ester bonds during digestion. Butyric acid is more rapidly absorbed from the small intestine than the decanoic, but any incorporation into glycerides of this acid could not be demonstrated in the rat's small intestine. The incorporation of free fatty acids in glycerides has now been shown to be due to a real synthesis of glyceride-ester bonds and not only to a trans-esterification. Fatty acids liberated from glycerides in the small intestine of the rat are absorbed more rapidly than the glycerides.

Some effects of vitamin B_6 deficiency on fat metabolism in rats. H. S. R. Desikacher and E. W. McHenry (Dept. of Public Health Nutrition, Univ. of Toronto, Canada). *Biochem. J.* **56**, No. 4, 544-547(1954). Using isocaloric feeding of two fat-free basal diets, one high in protein and the other in carbohydrate, rats supplied with pyridoxine showed an increase in carcass fat with a decreased iodine value.

Rats deprived of vitamin B_6 contained markedly less carcass fat with an apparent conservation of phospholipids and of unsaturated fatty acids. There were no marked differences in the amount of characteristics of liver lipids. Data on the incorporation of C^{14} (from fed glucose) suggest that fat synthesis proceeded equally in control and deficient rats. The decreased quantity of fat in deprived rats may be due to rapid utilization.

Note on the correlation of solubility data. A. I. Johnson, Chen-Jung Huang, and Ti-Kang Kwei (Dept. Chem. Eng., Univ. of Toronto, Toronto, Ontario). *Can. J. Tech.* **32**, No. 3, 127-132(1954). A method of correlating the solubility of different compounds in the same solvent is proposed. Solubility of A is plotted on a logarithmic scale against the temperature on an adjusted scale based on the solubility of a reference substance, B, whose chemical structure is similar to the former. By the procedure described the correlation is believed to be useful for interpolating and extrapolating whenever two solubilities at different temperatures are known and when no further data are available. Many of the fatty acids are used as examples and their solubilities given.

A rapid method for the determination of cereal lipase activity. R. B. Koch, A. R. Felsher, T. H. Burton, and R. A. Larson (Quartermaster Food and Container institute for the Armed Forces). *Cereal Chemistry* **31**, No. 2, 113-120(1954). A rapid method for the determination of cereal lipase activity is described. The free fatty acids liberated in an emulsified reaction mixture buffered at pH 7.9 and maintained at 36°C. are determined by electrometric titration with standard alkali at two- or three-minute intervals. The lipase activity followed a zero order reaction rate for reaction times between 10 and 60 minutes.

Phospholipids. 2. Estimation of amino nitrogen in intact phospholipids. C. H. Lea and D. N. Rhodes (Low Temp. Station for Research in Biochem. and Biophysics, Univ. of Cambridge, and Dept. of Scientific and Industrial Research, England). *Biochem. J.* **56**, No. 4, 613-618(1954). Unhydrolyzed amino-containing phospholipids are determined with ninhydrin in the buffered methyl cellosolve reagent used by Moore & Stein (1948) for the amino acids, and by Levine and Chargaff (1951) for the nitrogenous constituents in lipid hydrolysates. A discussion is given of the behavior of phospholipids and of simpler fatty esters in the direct Van Slyke procedure with a mention of the interference of unsatd. fatty acids to the Van Slyke estimation of amino N in intact phospholipids.

Acetate activation and acetoacetate formation in plant systems. Adele Millerd and James Banner (Kerckhoff Biological Laboratories, California Institute of Technology, Pasadena, Calif.). *Arch. Biochem. Biophys.* **49**, 343-355(1954). An enzyme which catalyzes the formation of acetyl CoA from acetate, ATP, and CoA has been purified from spinach. The acetate activating enzyme, which may be associated with the mitochondria, has been found in all plant tissues in which it has been sought. The preparation of the partially purified enzyme is active with a variety of normal and branched-chain fatty acids in addition to acetate.

The acetal phospholipides of blood serum in patients with liver diseases. O. W. Thiele (Justus Liebig Hochschule, Giessen, Germany). *Klin. Wochschr.* **31**, 907-8(1953). The serum levels of acetal phospholipides are normal in cirrhosis of the liver and below normal in hepatitis and obstructive jaundice. (*C. A.* **48**, 2884-5).

Tocopherol response curves and fat absorption. Julius Pomeranze and Ralph Lucarello (New York Med. College, New York). *J. Lab. Clin. Med.* **42**, 700-4(1953). Experiments were designed to determine whether tocopherol levels in plasma are altered by low-fat intake, by simultaneous feeding of tocopherol and a fatty meal, or by oral administration of aqueous tocopherol. Tocopherol was determined by a macromodification of the procedure of Quaife and Biehler (*C. A.* **40**, 106). Plasma tocopherol concentrations were determined at 3-hr. intervals in 12 normal individuals before and after oral administration of 1500 mg. tocopherol in oil and in water. Fasting serum concentrations ranged from 0.35-1.48 mg. %. The maximum elevation of serum tocopherol was noted with the aqueous dispersion (av. 1.53 mg. %, range 0.54-3.11, in water and 1.10, 0.24-3.08, in oil) and occurred in a shorter time (6 hrs. in water or 12 hrs. in oil). Serum tocopherol levels in 4 normal individuals on a normal diet without added tocopherol ranged from 0.35 to 1.48 mg. %; after a high-fat meal with 1500 mg. tocopherol added the tocopherol level ranged from 0.36 to 4.10 mg. %. Three individuals were maintained on a low-fat diet for 6 weeks prior to tocopherol administration. All fasting serum tocopherol levels were low, and tocopherol in oil administration produced a minimal response. The aqueous tocopherol dosage and the tocopherol in oil with a fat meal elicited a significantly increased response. (*C. A.* **48**, 2841)

The general effects and sterilizing action of cholesterol added to a diet rich in polyunsaturated fatty acids. Jeanine Raulin. *Compt. rend.* **233**, 1318-20(1951). Cholesterol was found to reinforce a diet in which the only lipide sources were margarine and lard (*C. A.* **45**, 5252). To continue these studies white rats were fed cholesterol with a diet rich in polyunsaturated fatty acids. Their general condition deteriorated considerably, the mortality rate was high compared to a control group, and serious cataracts and pronounced enlargement of the liver with blanching resulted. Abdominal fat was lost. There was 100% resorption of fetuses in pregnant females maintained on this diet. (*C. A.* **48**, 2847)

Vitamin E as an in vivo antoxidant. Hendrik Dam (Polytech. Inst., Copenhagen). *Experientia,* Suppl. 1, Present Problems in Nutrition Research **1952**, 195-213 (in English). A review. 83 references.

Extensive resection of the small intestine followed by vagotomy. Experimental study of fat and nitrogen excretion in dogs. E. C. Weckesser, J. L. Ankeney, A. F. Portmann, J. W. Price, F. A. Cebul, and W. Carter. *Surgery* **30**, 465-76(1951). Late vagotomy following extensive resection of the small intestine has no beneficial effect on the dog and is probably detrimental. Early vagotomy following resection has no permanent effect on fat and N excretion in the stool. Temporary improvement in fat and N excretion was noted but no improvement in nutrition. (*C. A.* **48**, 2848)

The role of albumin in the interaction of chyle and plasma in the rat. D. E. Robinson and J. E. French (William Dunn School Pathol., Oxford, England). *Quart. J. Exptl. Physiol.* **38**, 233-9(1953). When chyle is added to heparinized plasma *in vitro,* the amount of chyle which can be cleared is determined by the amount of plasma present. After clearing, the lipide which has become soluble can be recovered quantitatively from the albumin fraction of the plasma proteins in the form of fatty acids. The recovery of the lipide as free fatty acid indicates that hydrolysis of neutral fat is an essential part of the clearing reaction. Thus plasma albumin may act as carrier of lipide in the form of fatty acid in the blood. (*C. A.* **48**, 2849)

Use of carbon^{14} cholesterol for studying intestinal absorption and excretion of cholesterol in the rat. L. Bugnard, F. Chevallier, J. Coursaget, and T. Romanovsky (Groupe hospitalier Necker-Enfants malades, Paris). *J. physiol.* (Paris) **45**, 413-19 (1953). Rats deficient in cholesterol for 1-8 weeks received 10 mg. of cholesterol per day orally for several days. Of the ingested cholesterol 20-25% was found in the feces and 40-60% in the tissues. A significant fraction, 20-35%, was destroyed in the intestine or tissues. (*C. A.* **48**, 2854)

Changes in plasma lipides during the menstrual cycle. M. F. Oliver and G. S. Boyd (Univ. Edinburgh, Scotland). *Clin. Sci.* **12**, 217-22(1953). Plasma free and total cholesterol and phospholipides were estimated twice weekly for 5 weeks in 12 normal young women and 6 normal young men. There was a striking fall in cholesterol esters and a less marked fall in phospholipides at the time of ovulation and immediately prior to menstruation. The point where the cholesterol: phospholipide ratio was lowest coincided with the period of maximum estrogen activity in the cycle. The possible association of these changes with the sex difference in coronary artery disease is discussed. (*C. A.* **48**, 2858)

Lymph and lymph-proteins during absorption of fat and saline by rats. B. Borgström and C. B. Laurell (Univ. Lund, Sweden). *Acta Physiol. Scand.* **29**, 264-80(1953). In experiments on rats with lymph fistulas, the variations in lymph water and lymph protein flow suggest that the quantity of lymph formed depends on the variation of blood flow through the small intestine. The administration of lipides, and to a lesser degree that of saline or glucose solutions, increases considerably the blood flow. The electrophoretic protein pattern of lymph and of plasma is the same and is not affected by variations in protein concentration of the lymph. During the absorption of lipides the mean size of fat particles in the lymph increases and their relative phospholipide content decreases, but the lipoproteins found in the plasma do not increase in the lymph. (*C. A.* **48**, 2860)

The reduction of fat in the liver and in the flight muscle (pectoralis major) of Columbia livia during flight. J. C. George and Dolly Jyoti. *J. Univ. Bombay* **21**, Pt. 5, Sect. B, 72-3 (1953). There is a considerable amount of fat in the pectoralis major muscles of the pigeon. That much of this fat is utilized for energy during flight is evidenced by its quantitative reduction during continuous muscular contraction. There is a simultaneous reduction of fat in the liver presumably because of the transport of this material from the liver to the muscle (*C. A.* **48**, 2871)

Fat metabolism in nephrotic hyperlipemia. Walter Heymann, LeRoy W. Matthews, Joy Lemm, Paul Olynyk, Milena Salehar, and Caroline Gilkey (Western Reserve Univ. School Med., Cleveland, O.). *Metabolism, Clin. and Exp.* **3**, 27-31(1954). Levels of total lipide and cholesterol were determined in the serum of rats 2-12 months after the establishment of renal disease and 2-4 days before metabolism studies. An emulsion containing 80 mg. of trilaurin, labeled with C^{14} in the carboxyl group, per 100 g. of rat was administered by vein to groups of normal and nephrotic rats. The specific activity of the expired CO_2 (counts/min./millimole of CO_2/6 hrs.) was in normal range for 11 of 16 nephrotic rats and below the normal range for 5. The degree of hyperlipemia was independent of the rate of utilization of trilaurin. The rate of clearance of trilaurin from the blood stream was the same for nephrotic and healthy rats. Similar results were obtained after the intravenous injection of an emulsion containing 240 mg. of coconut oil/100 g. of rat. (*C. A.* **48**, 4099)

Intracellular conjugation and detoxification of palmitic acid by Mycobacterium tuberculosis. J. L. Karlsson (Western Reserve Univ.). *J. Bacteriology* **67**, 456-9(1954). The metabolism of palmitic acid by *M. tuberculosis* (BCG strain) grown on a modified Dubos medium was studied by determinations of respiratory rates and chromatographic analysis of lipid fractions after incorporation of palmitic or palmitic-1-C^{14} into the medium. Relatively low concentrations of palmitate are toxic; the effect depends on the ratio of palmitate to number of cells rather than on the absolute concentration of palmitate. Toxic effects were avoided by adding the palmitate in successive small portions; the increment of oxygen uptake was the same for each portion. Oxygen consumption is linked to the disappearance of palmitate. During the rapid phase of oxidation, almost half the palmitate is assimilated inside the cells in the form of an acetone soluble neutral lipid from which palmitic acid is liberated by alkaline hydrolysis.

• Drying Oils

Raymond Paschke, Abstractor

The mildew problem. R. C. Adams, J. S. Buckman, M. Goll, J. Broeker, and I. Hatfield (Monsanto Chem. Co.). *Paint Ind. Mag.* **69**, No. 4, 25(1954). Three methods of detection are available. (1) Transfer and culture of organisms, (2) microscopic examination, and (3) the ninhydrin test for protein are described. The genus *Pullularia* is the main offender. Zinc oxide alone does not control growth. Many components of modern paints can furnish food for fungi.

Paint technology and the law—Part 3. M. H. M. Arnold. *Paint Manuf.* **24**, 85(1954). This part discusses manufacturers' liability under common law (Brit.) and considers contractual obligations and liability for harm caused to any user by carelessness in the preparation or packaging of paint. A summary for all 3 parts is given.

Fractionation of castor oil. R. C. Basu, R. Choudhury, S. K. Das, and A. N. Saha (Univ. Coll. Sci. Calcutta). *J. Indian Chem. Soc., Ind. News Ed.* **16**, 24-6(1953). Constituents other than triricinolein in castor oil cause "after-tack" in dehydrated castor oil. Extn. in a separatory funnel with petr. ether (b. 40-60°) removed the undesirables. Increasing the ratio of solvent to oil increased the acetyl value of the raffinate. (*C. A.* **48**, 4861)

Clear finishes for exterior of houses. F. L. Browne (Forest Products Laboratory, Madison, Wisc.). Am. Paint J. **38**, No. 36, 88(1954). A review of weathering of wood, of the historical development of exterior finishes in U. S., and of modern types of natural finishes and their properties.

An indirect test for recognition of esterified oils. G. Canneri and M. Marconi (Univ. Florence, Italy). *Chimica e Industria* (Milan) **35**, 560(1953). The test is based on the reaction of Zn with dithizone. See *C. A.* **48**, 4862 for details.

The surface area measurement of paint pigments. P. C. Carman (Nat. Chem. Res. Lab., Pretoria, S. Africa). *Oil Colour Chemists' Assoc. J.* **37**, 165(1954). It is pointed out that surface area measurements of paint pigments should play a much greater part in production control and in specifications. A simple air permeability apparatus is described for making this measurement. Theoretical reasons are given for regarding optical methods as completely untrustworthy in the size range relating to paint pigments.

Properties cohesive. L. L. Carrick and R. E. Trease (Univ. of Michigan). *Paint Oil Chem. Rev.* **117**, No. 8, 12(1954). The cohesive strengths of alkali refined soybean oil films were investigated to determine the effect of the addition of pigments. The pigments used were: precipitated calcium carbonate, anatase titanium dioxide, and carbon black, with three particle size ranges for each.

The results of these tests have shown that pigments exert a definite reinforcement effect on the cohesive strength of a paint film. Both the concentration of the pigment and its particle size affect this reinforcing action. However, the effect of the fineness of the particles is greatly minimized by its flocculation into clusters which behave as larger particles. Because of their high surface activity, small particle pigments tend to increase the film's cohesive strength by their adsorption to each other to form a flocculated pigment structure, and to decrease the cohesive strength by the adsorption of the catalytic driers from the vehicle. Therefore the addition of fine pigment particles introduces opposing factors and the resultant film properties may vary, becoming more stiff when dispersion is poor or becoming more distensible when drier adsorption is predominant.

The drying of printing inks—the influence of paper. R. R. Coupe. *Paint Oil Colour J.*, **125**, 758(1954). Paper pH values less than 5.0 and high humidity increase the drying time. Adverse effects could be offset by increasing the concentration of driers in the ink. The addition of $CoSO_4$ to the paper during manufacture gave encouraging results.

Polyvinyl acetate as a paint vehicle. R. J. Davis (Celanese Corp.). *Am. Paint J.* **38**, No. 36, 78(1954). A review of preparation, properties, and formulation. No references.

New acrylic resins for coatings. H. Grinsfelder, W. C. Prentiss and V. N. Sheets (Rohm and Haas Co.). *Off. Dig. Federation Paint Production Clubs*, **26**, No. 352, 327(1954). A review.

Recent developments in silicone coating resins. R. C. Hedlund (Dow-Corning Corp.). *Off. Dig. Federation Paint Varnish Production Clubs* **26**, No. 352, 356(1954). A review discussing (1) heat resistant straight silicone resins, (2) heat resistant alkyds, (3) alkyds for varnishes, (4) phenolics, (5) special resins, and (6) masonry water repellents.

The styrenation of alkyd resins. A. R. Hempel (Monsanto Chemical Co.). *Am. Paint J.* **38**, No. 32, 72(1954). A discussion. No references.

Safflower. J. Kneeland (Pacific Veg. Oil Corp.). *Chemurgic Dig.* **13**, No. 2: 11-13(1954). Safflower seed is processed with normal oil mill equipment. After a simple seed cleaning operation, the oil can be removed with either solvent or continuous screw press plants. The processing of whole seed by expellers results in two products, the oil and 19% protein whole pressed safflower seed meal. With the application of dehulling prior to the oil removal three products are obtained, a better yield of oil, a 38 to 40% protein meal, and a large quantity of hulls. The safflower meal used up to 15% in hen rations gives egg production equal to soya and can replace soya in an all-mash ration for laying hens. The unusually high linoleic acid content and low saturated acid content coupled with the absence of linolenic acid gives the oil a faster dry than the iodine value of 145 would indicate, excellent color retention and freedom from after-yellowing, uniform gel structure not found in other drying oils, better mineral spirits tolerance and film flexibility. The low rate of acid increase, heat bleachability greater than any other oil, and color retention of safflower enables the alkyd and varnish maker to use a lower premium non-break instead of the more expensive alkali refined oil. This fast rate of body plus unusually good color and ease of alcoholizing is the reason for safflower oil finding its largest demand in alkyds of a general purpose use. The demand for safflower oil for lighter color, architectural enamels and outside gloss enamels is increasing.

The effect of lecithin on the dispersion of titanium dioxide in latex paints. M. Kronstein (N. Y. Univ.). *Paint Varnish Production* **44**, No. 5, 21(1954). A review. Lecithin increases the speed of pigment dispersion. 1% is the preferred amount.

Some recent studies on the autoxidation of drying oils. L. A. O'Neill (Paint Res. Station, Teddington, Eng.). *Chemistry and Industry*, **1954**, 384. With non-conjugated fatty oils the initial reaction is a chain reaction at the active methylene groups to give hydroperoxides, and double bond rearrangement to a conjugated system. The termination steps of this chain reaction will lead to dimerization. Decomposition of the hydroperoxides will involve further dimerization and various substitutive side reactions. Autoxidation of the conjugated double bond systems developed will take place as for conjugated oils. Large amounts of oxygen will be taken up and much scission will occur. The range of molecular sizes will be very wide, bonding by secondary valence forces will be considerable, and macromolecular network will be comparatively slow in developing. With conjugated fatty oils the main reactions are direct attack by oxygen at the double bond systems in the 1:4 or 1:2 positions with the competitive production of monomeric (predominant), dimeric and higher polymeric mainly carbon-carbon linked peroxides. A macromolecular network is soon built up but considerable scission occurs, particularly of the monomeric peroxides to give aldehydes.

Polyamide resin coatings. D. E. Peerman, D. Glaser, and M. S. Herban (General Mills, Inc.). *Org. Finishing* **15**, No. 4, 12 (1954). Polyamide resins are versatile condensation polymers available in a wide variety of physical forms. They have inherently high impact resistance, flexibility, adhesion, and gloss. They have excellent resistance to both H_2O and grease.

Polymerization of the methyl esters of the fatty acids from linseed oil, and the fractional separation of the polymerization products by means of solvents. A. H. Platz (Univ. Nacl. La Plata). Rev. fac. cienc. quim. **25**, 73-83(1950). Methyl esters of pure linoleic and linolenic acids form dimers, trimers, and sometimes tetramers by addn. reactions at the double bonds. A knowledge of the mechanism of these reactions and the structure of the resulting constituents depend on the ability to sep. the polymers for study. A method of prepg. the methyl esters and a method of polymerizing these are described. The polymers are sepd. by progressive fractional dissolution in methyl, ethyl, and propyl alcs. Tests of the fractionally dissolved portions show substantially the same sepn. of dimers and trimers that has been achieved by using mol. distn. techniques with expensive and complicated app. The dimers from linolenic and linoleic acids showed closely similar properties, as did the trimers from the two unsatd. acids. 15 references. (*C. A.* **48**, 4856).

The use of safflower oil in paint vehicles. J. W. Prane (National Lead Co.). *Off. Dig. Federation Paint Varnish Production Clubs* **26**, No. 352, 344(1954). A review.

Priming paints for light alloys. J. G. Rigg and E. W. Skerrey (Brit. Al. Co. Ltd. Imp. Smelting Corp. Ltd.). *Paint Manuf.* **24**, 75(1954). The results obtained from the exposure of light alloy specimens for six months in rural, industrial and marine atmospheres, with various primers under aluminum top coats, were published in the March, 1949, issue of "Paint Manufacture," and the present paper gives the further information obtained on continuation of the tests for three and a half years. The results confirmed earlier indications. Zinc chromate and zinc tetroxychromate primers were superior in protective value to iron oxide primer, although the latter provided satisfactory protection, especially to aluminum in the less severe environments. Red lead primer was definitely harmful on light alloys, and especially on magnesium in corrosive environments. In these tests both types of chromate primer were found to be slightly preferable to red lead on mild steel. Zinc chromate and zinc tetroxychromate pigments are preferred for primers for composite structures of steel and light alloys in severe exposure conditions, while iron oxide is adequate for milder conditions.

Fundamentals of paint, varnish and lacquer technology. Chapter X—The clear oleoresinous finish (Part 1). E. Singer (Troy Chemical Co.). *Am. Paint J.* **38**, No. 29(1954). A discussion. No references. (Part II) *Ibid.* No. 34, 74(1954).

Alkali-induced isomerization of linseed oil. P. Slansky. *Paint Manuf.* **24**, 121(1954). The paper describes some experiments dealing with the alkali-isomerization of linseed oil fatty acids, with glycerine as solvent, and leading to conjugation of about 50% of the total fatty acids. It was possible to separate a fraction for the isomerized linseed oil fatty acids, the triglyceride of which had a gelation time similar to that of tung oil. Despite the short gelation time the film-forming properties of this oil, with the exception of drying rate, were not very different from those of untreated linseed oil. It was found that a considerable amount of stearic acid was formed during the reaction of isomerization. This may explain the absence of parallelism between the gelation time and film-forming properties of alkali-isomerized linseed oil.

Determination of oil absorption: a new method. F. M. Smith and D. M. Stead (J. Anderson & Co. Ltd., Eng.). *Oil Colour Chemists' Assoc. J.* **37**, 194(1954). Preliminary work on the assessment of a new method for the determination of the oil absorption of pigments is described. The method involves the addition of pigment to oil on the automatic muller and it is claimed that results are nearer to the true oil absorption value besides being more reproducible than those obtained by the B. S. Method.

Polystyrene latices in emulsion paint formulation: post-plasticized systems. H. Taylor (Monsanto Chemicals Ltd., Eng.). *Oil Colour Chemists' Assoc. J.* **37**, 192(1954). The principle of incorporating aqueous resin or oil emulsions into ''water based'' paints as a means of improving the water resistance and physical properties of films produced from them is briefly reviewed; the process led to the development of the so-called synthetic resin emulsion paints based on polyvinyl acetate, polystyrene and styrene-butadiene copolymer emulsions.

''Film-forming polymer'' emulsions (polyvinyl acetate and butadiene-styrene copolymers) are compared with emulsions of ''non-film-forming polymers'' (polystyrene, etc.), which must be placticized by ''external'' means in order to ensure the production of continuous films on drying at normal temperatures.

The manufacture and properties of polystyrene latices are discussed in general terms and the importance of correct selection of the plasticizer to ensure the production of continuous films on drying is stressed; the methods of preparing plasticized polystyrene latices by the techniques of ''pre-plasticization'' and ''post-plasticization'' are explained and compared.

Processes for preparing emulsion paints from post-plasticized polystyrene latices are mentioned and detailed attention is given to a discussion of the various ingredients to be used in this connection, their effects on the properties of the paints produced and the paint films finally obtained from them.

Plasticizers, fillers, pigments protective colloids, preservatives, dispersing and wetting agents, defoaming agents and thickeners are dealt with in detail.

Drying oils from saturated fatty acids. J. Weiss (Stockholm, Sweden). *Paint Manuf.* **24**, No. 3, 98(1954). A letter to the editor saying that the ''catalyst'' C. F. (*Ibid.* **24**, No. 1, 5 [1954]) is an organo aluminum compd. and that the discovery is based on the classic Claisen reaction.

Preservation of paints. A. E. Williams. *Ind. Finishing* (London) **6**, 434(1954). Pentachlorophenol and its Na salt are very effective in the preservation of paints. Chem. properties and concns. in preserving water paints vary widely. (*C. A.* **48**, 4855)

PATENTS

Modified copolymers of drying oils and styrene. D. J. Carlick (to Interchemical Corp.). *U. S. 2,665,283.* Copolymers of drying oils, styrene, and isoprene are sol. in aliphatic hydrocarbons and are used in paints, printing inks and alkyd resins. The copolymers are prepd. by copolymerizing the reactants in the presence of an org. O-yielding catalyst, such as a peroxide or a heavily blown drying oil. Thus, 400 g. styrene, 50 g. isoprene, and 550 g. blown soybean oil were heated over a period of 1 hr. to 220°F. where an exothermic reaction started. The temp. was raised to 400°F. in 3.5 hrs., and the mixt. was stripped with CO_2 to obtain a balsam, sol. in aliphatic petroleum solvents, in 95% yield. *U. S. 2,665,284.* Similar copolymers of drying oils, styrene and 2-(and 4-)methyl-1,3-pentadiene are prepd. (*C. A.* **48**, 4858)

Polyfurfural-furfural alcohol coating composition. K. J. Lissant (to Petrolite Corp.). *U. S. 2,666,719.* A fast setting sprayable compn. contg. a clay, a vinyl resin and a ketone solvent. (*C. A.* **48**, 4858)

Epoxy resins as binders for paints and varnishes. F. Jaffe. *Belg. 520,976.* Di- and polyisocyanates are added to the epoxy resins in order to obtain strong films resistant to chemicals which will dry completely at ordinary temp. after 24-48 hrs. Primer antirust (red lead) (60%) 31% Epikote 1001 and 9% Desmodur TH are dissolved in a mixt. of 25% methyl isobutyl ketone, 25% Cellosolve acetate, and 50% toluene. In another example, TiO_2 (50%), 48.3% Epikote 1009, and 1.7% $(OCNC_6—H_4)_3CH$ are dissolved in a mixt. of equal parts mesityl oxide, methyl ethyl ketone, Cellosolve acetate, and toluene. For brushing, a soln. of 60 parts dry substance in 40 parts of solvent is used. For spraying, 50 parts dry substance is mixed in 50 parts of equal amts. of methyl ethyl ketone and toluene. *Belg. 522,407.* Part of the isocyanate is replaced by fatty acids which have first been allowed to react with the epoxy resins. The coated layers dry more quickly, and the final film is stronger. E.g., a paint comprises 23.75% of the reaction product of Epikote 1001 and unsatd. fatty acids obtained from dehydrated castor oil, 26% TiO_2, 2.25% Desmodur TH, 0.096% Co caprylate and 47.004% xylene. (*C. A.* **48**, 4857)

Paint for shipbottom. T. Tomioka (to Shinto Coating Materials Co.). *Japan 1984('53).* A mixt. of 90 parts wood tar and 10 parts pitch from distn. of fish oil fat acids is treated at room temp. with 2 parts S_2Cl_2, heated at 200°, then treated with 5 parts Cu oxides, hydroxides, or chlorides at 160-170°. The product is mixed with drying oil. (*C. A.* **48**, 4856)

Light-colored drying castor oil. S. Ando. *Japan 2232('53).* Castor oil and 2% $CuSO_4$ and 2% activated C are heated gradually up to 240° in vacuo (50 mm.) to give the product with an Ac no. of 9.8 and an I no. of 149. (*C. A.* **48**, 4857)

• Waxes

R. L. Broadhead, Abstractor

Industrial raw materials of plant origin. III. Candelilla and candelilla wax. P. M. Daugherty, H. H. Sineath, and T. A. Wastler (Georgia Inst. of Technol., Atlanta). *Georgia Inst. Technol., Eng. Expt. Sta., Bull. No. 16,* 56 pp. (1953); cf. *C. A.* **47**, 2509f, 6679g. The economics and technology of candelilla wax are reviewed. Tabulations of constants for wax derived from *Euphorbia antisyphilitica, E. cerifera, Pedilanthus pavonis,* and *P. aphyllus* are presented. (*C. A.* **48**, 4232)

The recovery of wool wax from wool scour liquors. L. F. Evans and W. E. Ewers (Commonwealth Sci. Ind. Res. Org., Melbourne). *Australian J. Appl. Sci.* **4**, 552-78(1953). A new lab. and com. scale process has been developed for the recovery of wool wax from wool scour liquors (I). I are aerated in flotation cells (II) and the froth formed is recirculated through the impellers of the cells. The froth is then washed by passing it in counterflow with wash water through two more II. The concentrate (contg. 20% wax on draining) is dispersed in alk. medium to give a concd. emulsion from which good quality wax is obtained by centrifuging. For I contg. 1.5% wax a 48% yield is typical (40% loss at the aeration and 12% during sepn. of wax from froth dispersion). The method described was developed for soap-soda I, but preliminary tests indicate applicability for I contg. synthetic detergents, as ''Lissapol N'' or ''Teepol.'' (*C. A.* **48**, 4232)

Examination of wool scour liquors. G. R. Edwards, W. W. Mansfield, A. G. Pagels (Commonwealth Sci. Ind. Res. Org., Melbourne). *Australian J. Appl. Sci.* **4**, 552-78(1953). The detailed procedure used in the above work for detn. of wool wax, soap, and insol. dirt in wool scour liquors is described. (*C. A.* **48**, 4232)

The chemical constitution of cork. III. Alkaline alcoholysis of cork. Andre Guillemonat and Alfred Strich (Fac. med., Algiers. *Bull. soc. chim., France 1953,* 378; cf. *C. A.* **45**, 3327. Powd. cork (100 g.) is boiled 5 hrs. with 1.2 l. MeOH contg.

alkali. The solvent is evapd. and the residue extd. with Cl_2C:CHCl (I) to give a sol. ext. (II) consisting of mixed waxes and Me esters of suberin. The I-insol. residue (III) contains some H_2O-sol. material (IV). The amt. of alkali (g./1.2 l. MeOH) and the yield (g.) of II, III and IV are, in the order given: 4 KOH, 10, 92, 8; 5 KOH, 28, 76, 9; 6 KOH, 53, 52, 10; 7 KOH, 53, 54, 10; 4:3 NaOH, 52, 53, 11; 6 NaOMe, 52, 50, 10. The products obtained with KOH are much clearer than those with NaOH. No products were obtained with CaO or NH_3. (*C. A.* **48**, 4216)

Waxes in the cosmetics industry. L. Ivanovszky. *Seifen-Ole-Fette-Wachse* **80**, 197-200(1954). The uses of natural, refined and synthetic waxes in cosmetic preparations are discussed.

The effect of phase-volume ratio on emulsion type. I. Beeswax-borax ointments. Rupert Salisbury, E. E. Leuallen, and L. T. Chavkin (Ohio State Univ., Columbus). *J. Am. Pharm. Assoc.* **43**, 117-19(1954). The emulsion type of a basic cold cream consisting of beeswax-borax, liquid petrolatum, and H_2O is H_2O-in-oil if the aq. phase (I) is less than 45% and oil-in-H_2O when I is 45% or more. (*C. A.* **48**, 4776)

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Lubricating greases. Eduard Orno-Ornfeldt (to Chemieprodukte G.m.b.H.). *U. S. 2,658,037,* Nov. 3, 1953. Unsatd. fats are sapond. with caustic soda, mixed with at least an equal wt. of mineral oil, heated to remove the water, and maintained at 170° until homogeneous when cooled. The mass is mixed with 2-4% beeswax and heated to 180°, cooled in a thin film, ground, and dissolved in tetralin or benzol, and aged for 24 hrs. The product (2-5% by wt.) may be used with mineral oil to form a grease. (*C. A.* **48**, 4216)

Lubricating greases. Paul R. McCarthy (to Gulf Research & Development Co.). *U. S. 2,662,056,* Dec. 8, 1953. The consistency of a lubricating grease contg. an org. bentonite (I) compd. in oil (*C. A.* **30**, 3168) is increased by the addn. of 0.1-1% water prior to milling. Thus, a compn. contg. octadecylamine bentonite 6, dimethyldihexadecylammonium bentonite 3, mineral oil 88.7, and MeOH 2.3 parts to assist dispersion has a worked penetration of 300. The same lubricant contg. 0.32% water has a worked penetration of 220. *U. S. 2,662,057.* From 0.1 to 1.5% of a diaryl amine is added to a grease contg. I to improve the oxidation stability. Examples are diphenylamine, phenyl-1-naphthylamine, phenyl-2-naphthylamine, and the dinaphthylamines. *U. S. 2,662,058.* Thixotropic greases and prepared by dispersing I in a mixture of a wax (II) and oil in an amount so that the ratio of I to wax is less than 1:1. Examples of II which should have an ASTM m.p. higher than 120°F. are ceresin wax, beeswax, paraffin wax, and montan wax. The greases are useful in the lubrication of aircraft instruments and control bearings. *U. S. 2,662,059.* Greases are prepd. by dispersing 5-15% of I in a dibasic acid ester synthetic lubricating oil, such as bis (2-ethylhexyl) sebacate. (*C. A.* **48**, 4214)

Extraction of products from bark. Ervin F. Kurth (to State of Oregon, acting by the Oregon State Board of Forestry). *U. S. 2,662,893,* Dec. 15, 1953. A process is claimed for the sepn. of valuable wax products, dihydroquercetin, tannins, and phlobaphenes, from the barks of trees. In an example, 50 lb. of bark ground to pass through ⅜ in. mesh screen and having a moisture content of 30% by wt. was charged to an extractor. Hot petroleum naphtha, b.50-72°, at 55° was passed upward through the mixt. in a continuous manner, the ext. of dissolved wax being withdrawn from the extractor, stripped with steam, and recycled through the extractor. The limit of the extn. was reached after approx. 4 hrs. The wax had the following properties: m.59-62°, acid no. 30-70, sapon no. 130-164, unsapon. 18-30%, I no. 18-22, and the color was light yellow to light brown. Sapon. of the wax by alc. KOH and chem. analysis showed 20% (by wt.) lignocerylalc., 60% lignoceric acid, and 20% ferulic acid. Phytosterol and oleic acid also were present in small amts. Steam was then passed through the extractor which contained the bark residue from which the previous wax was sepd., and the extn. continued with C_6H_6 at 75° at a flow rate of 35 gal./hr. and a solvent to bark ratio of 3.1 gal./lb. bark (dry). Isolation of the C_6H_6-sol. material gave a wax with the following properties: m.60-3°, acid no. 74, sapon no. 200-10, unsapon. 5-7%, and the color was brown to red brown. Sapon. of the latter wax with alc. KOH gave yields of 25% fatty acid, 24% dark Et_2O-insol. phlobaphene, 26% Et_2O-sol. acid, 5% unsapon. matter, and glycerol. The remaining bark was then extd. with Et_2O to obtain 5-8% dihydroquercetin, m.228-230°. The latter upon oxidation with H_2SO_4 in air gave quercetin, m.312-14°. Further extn. of the bark residue with H_2O at 70-94° gave tannin; extn. of the remaining bark with hot EtOH gave 6% phlobaphenes, suitable as an adhesive. (*C. A.* **48**, 4149)

Treatment of cork. Societe generale d'enterprise du sud de la France. *Fr. 898,531,* Apr. 25, 1945. The washed residue from the hydrolysis or sapon. of cork is oxidized with 10° Be. HNO_3 at elevated temps. and thereafter with 30 Be. HNO_3 in the cold for 3 days. Purified waxy materials are obtained. (*C. A.* **48**, 4732)

Treatment of wax for polishing compositions. Establissements Kolb-Carriere. *Fr. 981,202,* May 23, 1951. Wax, especially beeswax, is sapond. with a strong base, the soap is acidified, and the free acids are converted to soaps, amines, or amides. The products can be used as emulsions or in soln. In the example beeswax is sapond. with caustic soda, and the product is decompd. with dil. H_2SO_4. The free acids are neutralized with dil. NH_4OH. Triethanolamine can be used to form the soaps. (*C. A.* **48**, 4867)

Eliminating the turbidity of refined lubricating oils. Nigrin-Werke Carl Gentner, Chemische Fabrik and Wolfgang Sapper (Wolfgang Sapper, inventor). *Ger. 822,288,* Nov. 26, 1951 (Cl. 23c, 101). The turbidity of refined used lubricating oils (caused particularly by the pptn. of paraffin hydrocarbons) is eliminated by dissolving a small amt. (e.g., 0.02%) of a natural or synthetic wax product, such as beeswax, at an elevated temp. (e.g. 70°) and cooling the products in a period of preferably 12-14 hrs. at atm. temp. The wax products, acting as solubilizing agents for the substances causing turbidity, do not disadvantageously influence the essential-oil properties, such as viscosity, pour point, flash point, and neut. no. (*C. A.* **48**, 4214)

Gelatinous dynamite. Kumao Hino (to Nippon Chemical Drug Co.). *Japan. 2247 ('53)* May 20. A mixt. of C_3H_5-$(ONO_2)_3$ 28, nitrocellulose 1.2, NH_4NO_3 43.3, starch 1.0, NaCl 20.0, soft wax 0.5, and urea 6.0% is pressed into sticks and wrapped. (*C. A.* **48**, 4840)

Improved paraffined papers. Jose Castellvi Molina. *Span. 202, 123,* June 27, 1952. Paraffin (92-98%) is added to 1.5-8% molten glyceride wax and 1% whitening reagent. A thin paper (0.008 mm.) is coated with it and then stamped on the coated side. This pressure causes crystn. which helps to avoid wetting of the paper by greases, etc. The glyceride wax (glycerides of stearic acid, or mixts. of stearic and palmitic acids, stearins and stearates, except the alk. stearates) acts as a drying agent. (*C. A.* **48**, 4836)

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• Detergents

Lenore Petchaft, Abstractor

Behavior of surface active compounds during finishing processes. Anon. *Z. ges. Textil-Industrie.*, **55**, 1376-81(1953). Review of developments in textile chemistry relative to wetting agents, antistatic brightening agents, stain removers, and surface-active compounds. A classification of textile assistants is given; it is based on grouping together products which modify the surface of fibers or fabrics, and compounds having essentially surface-active properties.

The glass-degreasing power of washing and cleansing agents. Raymond Baumgartner. (Eidg. Materialprufungsanstalt. St. Gallen, Switz.) *Seifen-Ole-Fette-Wachse.* **79**, 488-9, 514-16, 540-2, 568-9, 597-9, 622-5, 645-7(1953). A review on various types of dishwashing compounds includes a method for evaluating their glass-degreasing efficiency. Glass plates dried at 105° and brought to 100° are soiled by immersion in lard containing 4.5% peanut-oil fatty acids and colored with 0.5% nigrosin at 60° for 10 sec. They are washed by immersing 50 times in a dish-washing compound solution in a machine, dried at 105°, and the weight percent of fat removed is determined. Alkalies assist in the degreasing process. Na pyrophosphate and Na polyphosphates approach the activity of the best organic synthetic detergents. A mixture of 2 detergents (40% synthetic detergent) shows the same glass-degreasing efficiency as 100% soap within the concentrations used (0.25 to 8 g./l.) 130 references. (*C. A.* **48**, 5531)

Electrolytic properties of compounds with interface-activity and their behavior in finishing processes, particularly during wash-

ing. W. Kling. *SVF Fachorg. Textilver.* 8, 483-86(1953). (in German). Ionogeneity of compounds with interfacial activity, behavior of compounds with different ionogenic properties, charges of fibers and of dirt in aqueous medium, and reactions depending upon these charges are discussed in relation to the detergent action of these compounds. The fact that non-ionic substances are also satisfactory detergents leads to the conclusion that the electric charge is not the only factor involved in the detergent mechanism.

Determination of the alkalinity in detergent solutions by titration. W. Mohr and A. Wortmann (Physik. Inst. Bundersversuchs- und Forschungsanstalt, Kiel, Ger.) *Proc. 13th Intern. Dairy Congr. (Hague)* 3, 863-5(1953). Adjustments for detergent solutions to necessary concentration can be determined by titrating in the cold to the first color change with 0.1 N HCl with methyl orange (I) or phenolphthalein (II). Solutions containing free Cl_2 must be treated with 1 cc. of perhydrol for each 10 cc. of detergent solution and boiled for 5 min. under a watch glass before testing. II is a very satisfactory indicator because bicarbonates which have no cleaning value are not titrated. I cannot be used for spent solutions. II or thymolphthalein can be used after removal of fat and protein. Each detergent must have its titration value established. (*C. A.* 48, 4864)

The surface tension of solutions of cationic surfactants. Constantin Paparoditis and Jean Guastalla. *Compt. rend.* 237, 977-9(1953). (*C. A.* 48, 4864)

Determination of triphosphate and pyrophosphate by isotope dilution. O. T. Quimby, A. J. Mabis, and H. W. Lampe (Procter & Gamble Co., Cincinnati, Ohio). *Anal. Chem.* 26, 661-7 (1954). Triphosphate and pyrophosphate may be determined by isotope dilution even in presence of inorganic salts such as sulfates and silicates and anionic detergents.

Hemolysis by colloidal electrolytes. Sydney Ross and Arthur M. Silverstein. (Renssalaer Polytechnic Institute, Troy, New York). *J. Colloid Sci.* 9, 157-65(1954). The hemolytic action was measured at 20°C. and at 37°C., of each of a homologous series of sodium alkyl sulfates (C_8 to C_{18}) and of each of a homologous series of benzyldimethylalkylammonium chlorides (C_8 to C_{18}) dissolved in water, and in n-propanol-water mixtures. The results are examined for their bearing on a recent theory of the physical chemistry of hemolysis by surface-active agents. The effect of colloidal association on both hemolytic and bactericidal action of surface-active agents is discussed.

Analysis of textile auxiliary products. J. A. Van der Hoeve. *J. Soc. Dyers Colourists.* 70, 145-54(1954). Methods of analysis of newer textile auxiliary products such as the cation-anion-active compounds, phosphonium compounds, etc. are reviewed and systematized. The main scheme of analysis is based on detection of any organically combined nitrogen that may be present, determination of the ionic nature of the compound and determination of the type of hydrocarbon group in the compound. The following tests have been used—heating with alkali, followed by the alkaline bromine test, cation and anion tests, the diazo test, Guerbet's test and the starch-iodine tests.

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Improvements relating to synthetic detergents. Colgate-Palmolive-Peet Co. *Brit. 705,408.* An improved method for the production of synthetic detergents having a mixed active ingredient content which can be used directly for formulating heavy duty compositions having balanced sudsing and cleaning properties is described. Such a composition contains water-soluble salts of sulfonated mono-esters of polyhydric alcohols and fatty acids having 8 to 26 carbon atoms as an essential ingredient. By reacting such preformed monoesters with an excess of sulfonating agent and neutralizing the acid reaction product, the improvement, which comprises adding at any state prior to the neutralization an alkylated aromatic compound, results in better foaming and detersive properties.

Improvements in liquid detergent compositions. Lever Brother & Unilever Ltd. *Brit. 704,687.* Clear solutions of synthetic detergents can be obtained by dissolving two or more detergents, at least one of which is present in an amount which, when dissolved separately under the same conditions, in the same amount of aqueous solvent, would not yield a clear solution. Compounds may be nonionic or anionic having the general formula RSO_3M where M is an alkali or alkaline earth metal and R is an aliphatic group containing at least ten carbon atoms and either an amide or an ester linkage, or where R represents an alkyl substituted mono-nuclear aromatic ring.

Built organic detergent compositions and processes for preparing them. Colgate-Palmolive-Peet Co. *Brit. 706,720.* Uniformly soluble, non-dusting and non-stratifying built organic detergent compositions are prepared by intimately admixing solid organic detergent particles, and in finely divided substantially anhydrous form a solid builder which is capable of forming a hydrate while adding moisture and agitating, so as to produce a product in the form of particles each comprising an organic detergent core with a crystalline coating of hydrated builder on the surface.

Bar detergents from polyoxyethylene ethers and urea. George E. Barker (Atlas Powder Co.). *U. S. 2,665,256.* Mixtures of liquid or waxy polyoxyethylene ethers with urea form solid compositions which may be molded or cut into detergent bars, flakes, or granules. The ratio of the ethers to urea may be between 10:90 and 50:50 depending upon the hardness of the ethers.

Method of testing the solubility of bar soap. Frederick Leslie Toof (Micro Processing Equipment, Inc.) *U. S. 2,674,889.* The lathering properties of a soap bar are determined by holding a soap bar with one flat surface in contact with water of predetermined hardness, immersed only slightly in the water, and after a predetermined time of immersion, measuring the size and opacity of the precipitate cloud which forms as a result of the immersion.

Detergent compositions. Parke Woodworth and Laurence T. Sherwood, Jr. (Du Pont). *U. S. 2,675,356.* A detergent composition having excellent detergent characteristics and a minimum tendency to cause skin rash or irritation consists of at least 10% by weight of a solid anionic organic detergent and from about 0.1-10% of a solid crystalline complex of urea and a straight-chain aliphatic alcohol containing at least 7 carbon atoms, and the remainder of the composition consisting of an alkali metal salt builder.

Concentrated aqueous soap solution of low viscosity. Fred Fortess and Seth T. Bowen (Celanese Corp. of America). *U. S. 2,676,152.* A concentrated aqueous soap solution of low viscosity is prepared by adding to selected sodium or potassium soaps as a viscosity reducing agent about 15 to 25% by weight of an alkali metal oleate, the alkyl group containing from 3 to 10 carbon atoms.

Manufacture of soap bars or tablets. Frederick Oliver James (Lever Brothers Co.) *U. S. 2,677,665.* A plodded filled soap having relatively lower total fatty matter levels, or made from softer fat charges, which is hard enough for satisfactory handling is made by adding sodium aluminum silicate gel to hot molten soap. The soap, which may then have a total fatty matter content of between 30 and 60%, is then rapidly chilled and the solidified soap is then plodded.