Letter to the Editor

December 3, 1956.

We wish to thank B. K. Mukherji for calling attention (J. Am. Oil Chemists' Soc., *33*, 537) to his paper published in the Indian Soap Journal, *20*, 187 (1955). The paper is unfortunately not listed in Chemical Abstracts, and this explains the omission of reference.

The paper on "Use of Ion-Exchange in Rapid Estimation of Fatty Acids in Soap" by Dutta and Mukherji uses the well-known principle of salt splitting by cation exchange resins and employs coal sulfonated in the laboratory as the cation exchanger. The utilization of Dowex 50 resin is recommended in our paper as more convenient. By using a small sample (0.2–0.5 g.) and following with a complete washing, there is no hold-up, and one column, in contrast to the method of operation of Mukherji, may be used for a considerable number of determinations. There is no need to select a particular fraction inasmuch as the total effluent is titrated. Finally it is difficult to estimate the accuracy and precision of their method since only one example is published.

If Dutta and Mukherji were to elute further with solvent, it would eliminate the need for taking a particular fraction of the total effluent with subsequent correction for the weight of sample remaining in the column. They will then have a method which should prove analytically sound and practical.

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ABSTRACTS . . . R. A. REINERS, Editor

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• Oils and Fats

Castor oil, an important raw material in the chemical industry. St. Anastasiu. *Rev. chim.(Bucharest)* 6, 587–90(1955). Castor oil from *Ricinus communis* seeds containing approximately 87% ricinoleic acid is used extensively in the Rumanian chemical industry. Several of its reactions, such as esterification with mono- and dibasic acids, catalytic hydrogenation, thermal degradation, and preparation of heptanal and hendecenoic acid by cracking are reviewed. (*C. A.* **50**, 17485)

Close control of flow and temperatures in soybean oil extraction. M. R. Spencer and G. Weyermuller(Central Soya Co., Chattanooga, Tenn.). *Chem. Processing* **19**(6), 10–11(1956). Instrumentation is described and illustrated. (*C. A.* **50**, 17486)

Measurement of the rancidity of oils by the surface tension. Máximo Da Fieno V. and Rebeca Botton R. *Rev. fac. quím. Univ. nacl. mayor San Marcos(Lima, Peru)* 7(1), 32–5(1955). Data are given to show that surface tensions for soybean, cottonseed, peanut, castor, and olive oils increase with increase of acid content. Surface tensions were determined with a Du Nouy tensiometer. (*C. A.* **50**, 17485)

Use of light absorption measurements as a means of determining colored impurities in glycerine. H. Weiss. *Chem. -Ztg.* **80**, 129–30(1956). Data have been obtained to indicate that the light absorption of glycerol varies with the water content. With a blue filter the light absorption increases sharply as 88% glycerol is diluted with water to a concentration of 83.6%. At this point with continued dilution the absorption decreases until a concentration of 72% is reached, at which point further dilution produces no change. The use of light absorption measurements for the purpose of detecting colored impurities must, therefore, be modified by the dilution of the sample and the comparison glycerol standard below the 72% point. (*C. A.* **50**, 17481)

Method of refining rapeseed oil. I. Decolorization by heat-treatment. Susumu Kajizuka and Seijiro Akatani(Yamagata Univ., Tsuruoka). *J. Yamagata Agr. Forestry Soc.* 7, 18–20(1954). The decolorization of rapeseed oil can be achieved by heat-treatment at 250° for 5 minutes. The decolorization ratio was about 90%. The loss of oil was negligible. Heat treatment did not raise the acid number. **II. Decolorization by heat treatment of extracted rapeseed oil.** *Ibid.* 8, 20–2(1955). The oil used in the above report was obtained by pressing with the expeller. Solvent extracted rapeseed oil was also suitably decolorized by the same method. (*C. A.* **50**, 17485)

Polarography in the field of fats. IV. Tert-butylhydroxyanisoles and their electrochemical properties. J. Baltes(Deut. Inst. Fettforschung, Munster/Westf., Ger.). *Fette, Seifen, Anstrichmittel* **57**, 656–60(1955). 2-Tert-butyl-4-methoxyphenol, 3-tert-butyl-4-methoxyphenol, and considerable amounts of the 2,5-di-tert-butyl derivative are formed by the reaction of hydroquinone mono-methyl ether with isobutylene with phosphoric acid as a catalyst. Their polarographic behavior, in view of their antioxidative effects, was investigated to complete an earlier study(*C. A.* **50**, 3117). From the measurements the reaction mechanism of the anodic oxidation is apparent. (*C. A.* **50**, 17480)

The effect of technological operations on fatty oils. V. C. Vidal. *10th Congr. intern. inds. agr. y aliment., Madrid,* **1954**, 3184–95. Ultraviolet absorption spectral curves for pressed, solvent extracted, neutralized, and decolorized peanut oils are compared. (*C. A.* **50**, 17482)

Separation and identification of fatty acids. XVII. Paper chromatography of saturated fatty acids as their 2,4-dinitrophenylhydrazides. Yoshiyuki Inouye and Manjiro Noda(Kyoto Univ.). *Bull. Agr. Chem. Soc. Japan* **19**, 214–9(1955). The 2,4-dinitrophenylhydrazides of acetic, butyric, caproic, caprylic, capric, lauric, myristic, palmitic, stearic, arachidic, and behenic acid were chromatographed on paper impregnated with Tetralin by using alcoholic solution of Tetralin as the moving solvent and alcoholic potassium hydroxide solution as the spraying agent. The 2,4-dinitrophenylhydrazides of odd-numbered acids were obtained as crystals, but used for paper chromatography without recrystallization. Coconut oil, Japan wax, beef tallow, and peanut oil were analyzed for fatty acids by this method. (*C. A.* **50**, 17478)

Antioxygen activity of some fatty acid esters. M. Gayte. *Parfumerie mod.* **48**(50), 67–72(1956). The protective role against oxidation of vegetable oils at 20–60° under ultraviolet illumination was measured for 1% mono- and di-stearate of glycerol, or 2% mono- and di-oleate of glycerol, or 5% monostearate of polyglycol, or 10% Lebrafil(M. Gattefossé). These surfactants have a protective effect against the oxidation of vegetable oils, probably due to a surface effect of the oriented molecules containing hydroxyl groups. (*C. A.* **50**, 17479)

Urea adducts with fatty compounds. X. Adducts with some polyalcohol monoesters. J. M. Martinez Moreno, J. Ruiz Cruz and C. Janer del Valle. *Grasas y aceites(Seville, Spain)* **7**, 147–9(1956). The molar ratios of urea to ester, of a series of urea adducts of monoesters of glycol and glycerol having fatty acid chains of 9–21 carbon atoms are linear functions of the number of carbon atoms of the acids. The urea adducts are prepared by mixing a saturated solution of the ester in an inert solvent with 3:1 excess of urea in methyl alcohol and washing the precipitate with ethyl ether. (*C. A.* **50**, 17480)

The odorous products of peanut oil. II. D. Lefort and Janine Sorba(Lab. General Corps C.N.R.S., Bellevue). *Bull. soc. chim. France* **1956**, 69–75. The methanol extract of the odorous fraction of peanut oil was characterized. Hexanal and 2,4-decadienal were identified. Saturated and unsaturated hydrocarbons of 18 carbons were found to be the chief components of the carbonyl-free fraction. Chromatography of the unsaponifiable fraction of industrial product of peanut oil yielded hydrocarbon mixture of C_{20}, C_{22}, and C_{26} with straight chains and chains having terminal gem dimethyl groupings. (*C. A.* **50**, 17485)

Use of the "furfural point" for the characterization of vegetable oils. E. Angelscu and C. Albu(Fac. chim., Bucharest). *Rev. univ. "C. I. Parhon" politeh. Bucuresti, Ser. stiint. nat.* **2**, 72–6(1953). A test developed to determine the degree of unsaturation of vegetable oils is based on the solubility of the oil in selective solvents. The temperature at appearance of cloudiness of a solution of oil in furfural is recorded as the furfural point of the oil. Results obtained with this furfural point are similar to the iodine numbers and permit classification of the oils as drying, semidrying, and nondrying oils. Comparative data obtained with the furfural point and the iodine number determination are given for soybean, sunflower, olive, tobacco, flax, and hemp oils. (*C. A.* **50**, 17483)

Effect of oleic acid and sodium hydroxide on the solubilization of 1-butanol and 3-methyl-1-butanol in aqueous solution of sodium oleate. A. N. Bose and K. N. Mehrotra(Lucknow Univ.). *J. Colloid Sci.* **11**, 250–3(1956). The amount of butanol solubilized in aqueous solution of 75% neutralized oleic acid is the same as in neutral sodium oleate. The neutral soap is the better solubilizer for $(CH_3)_2CHCH_2CH_2OH$. The fact that viscosity of the solutions reaches a maximum at 60% butanol indicates that different types of miscelles exist above and below this concentration. (*C. A.* **50**, 16271)

Problems of rice-bran oil. Motoyoshi Miyazaki(Food Research Inst., Tokyo). *J. Utilization Agr. Products* **1**, 162–5(1953–4). A review is given of the raw material, extraction, and purification, with 49 references. (*C. A.* **50**, 17484)

Obtaining fatty alcohols by the hydrogenation of plant oils. R. Sanchez Delgado. *10th Congr. intern. ind. agr. y aliment., Madrid* **1954**, 3623–30. Hydrogenation of bagasse oil and grape-seed oil for 60–260 min. at 250–330 atm. and 250–60° with a Cu-Cr catalyst gave a maximum yield of stearyl alcohol. (*C. A.* **50**, 17484)

Hydroxylation of methyl oleate by means of ammonium persulfate. M. Naudet(Natl. Lab. Fatty Materials, Marseille, France). *Compt. rend. 27ᵉ congr. intern. chim. ind., Brussels, 1954*, **3**; *Industrie chim. belge.* **20**, *spec. No.*, 721–3(1955). The results obtained when methyl oleate dispersed in varying quantities of aqueous acetic acid with and without sulfuric acid was treated with excess ammonium persulfate were reported. The products were mixtures of methyl oleate, methyl dihydroxystearate, methyl acetoxyhydroxystearate, and methyl oxostearate. The oxidation of methyl oleate with ammonium persulfate in aqueous sulfuric acid introduced some hydroxyl and ketone functional groups and also ruptured the fatty acid chain. (*C. A.* **50**, 16674)

Oil from the meat of sperm whale (Physeter catodon). Torbjørn Pedersen. *Norsk Hvalfangst-Tidende* **41**, 296–8(1952). Sperm whale meat from the back muscles contained 72.8–74.3% water, 1.6–4.84% oil, 22.12–23.45% protein, and 0.97–1.16% ash; from the muscles underneath the spinal column 73.18–75.67% water, 1.18–2.79% oil, 21.66–22.93% protein, and 1.03–1.12% ash; from the belly 71.55% water, 5.75% oil, 21.37% protein, and 1.29% ash; and from the ribs 61.20% water, 8.47% oil, 21.01% protein, and 1.39% ash. Oil from sperm whale meat boiled in water had the following characteristics: acid value 1.24–3.96, saponification value 68.1–96.8, unsaponifiable matter 27.3–38.5%, iodine value of unsaponifiable matter 59.9–72.2, and cholesterol content 0.44%. Oil from sperm whale meat extracted with ether had the following characteristics: saponification value 124.6–138.0, iodine value 77.4–58.6, unsaponifiable matter 35.3–39.3%, and iodine value of unsaponifiable matter 63.8–64.6. (*C. A.* **50**, 17484)

Fatty oil from Pachypleurum alpinum. Yu. A. Dranitsyna. *Trudy Botan. Inst. im. V. L. Komarova Akad. Nauk S.S.S.R.* **5**(5), 85–9(1955). From the roots of *P. alpinum* 23.3% of a fatty oil was isolated. The oil contained linoleic acid, 64.33%; oleic acid, 20.05%; an acid with conjugated double bonds, 14.27%; and saturated acids, 1.35%. (*C. A.* **50**, 17483)

Physical and chemical properties of the oils of the seeds of Erythrina rubrinervia and Sophora secundiflora. X. A. Dominguez and Irene V. Canales(Inst. technol. estudios super., Monterrey, Mex.). *Rev. quím e ing. quím.(Monterrey)* **1**(1), 23–7 (1954). The following data were obtained on the seeds of *E. rubrinervia* and *S. secundiflora*: water 7.03 and 7.99%; ash 2.22 and 1.99%; ether extract 15.46 and 15.7%; protein 20.46 and 17.8%; carbohydrate 56.56 and 56.68%. The oils of both plants were isolated by petroleum ether extraction and gave the following data: d_{25}^{25} 0.9093 and 0.9193; n_D^{22} 1.4688 and 1.4676; m.p. 13–14° and 14– 15°; saponification number 200–205 and 188–193; iodine number 75–78 and 95–100; acetyl number 29.35 and 32.36; acid number 3.43 and 3.04; unsaponifiable fraction 1.90 and 1.99; saturated fatty acids 23.31 and 24.54%; unsaturated fatty acids 72.59 and 69.05%; oleic acid 58.03 and 52.81%; linoleic acid 14.70 and 16.34%; stearic acid 10.46 and 9.19%. (*C. A.* **50**, 17483)

Mechanism of alcoholysis of vegetable oils. II. I. I. Zeidler, E. E. Shkol'man, and N. M. Voroshilova(Paint-Lacquer Plant, Chelyabinsk). *Zhur. Priklad. Khim.* **29**, 1275–82(1956). Experiments with various proportions of glycerol and linseed oil under nitrogen at 240° in presence of litharge showed that the extent of glycerolysis as determined by hydroxyl number of the product and its content of monoglycerides depends on the proportions of the reactants especially up to a 3:1 proportion. Fractionation of the products indicates the probable formation of derivatives of polyglycerol in the reaction. The hydroxyl number of the reaction product tends to be below that calculated from monoglyceride concentration; this is explainable on the basis of side reactions.

III. E. E. Shkol'man and N. M. Voroshilova. *Ibid.* 1425–31. Alcoholysis of cottonseed oil with pentaerythritol is accompanied by side reactions connected with dehydration and polymerization of the unsaturated acyl groups. This results in a lowering of the hydroxyl number of the product; low temperature and shorter duration decrease this effect. (*C. A.* **51**, 1629)

The influence of paraffin composition on the yield and quality of derived synthetic fatty acids. N. K. Man'kovskaya, I. V. Barsegyan, and G. I. Moskvina. *Masloboino-Zhirovaya Prom.* **22**(6), 20–4(1956). The composition and heat treatment of paraffin as the factors controlling the yield and quality of fatty acids used in the manufacture of soap are discussed. (*C. A.* **51**, 1628)

Synthetic carotenoids as food dyes. O. Isler, H. Lindlar, M. Montavon, R. Rüegg, G. Saucy, and P. Zeller(F. Hoffmann-La Roche & Co., A.-G., Basel, Switz.). *Mitt. Lebensm. Hyg.* **47**, 183–90(1956). A synthesis of some carotenoids, such as β-carotene, β-C_{40}-diol, lycopene, and zeaxanthin, is described. The identification of the synthetic products with the natural ones was demonstrated by physical, chemical and biological methods. (*C. A.* **51**, 1493)

Natural fats. XII. Aspects of analysis of natural fats by crystallization. A. R. S. Kartha(Indian Agr. Research Inst., New Delhi). *J. Sci. Ind. Research(India)* **15A**, 116–24(1956). It is shown that the Hilditch and Lea method of determining fully saturated glyceride contents of fats by acetone-potassium permanganate oxidation is liable to possible error through hydrolysis of azelaoglycerides. It is shown that the saturated acid content as determined by the acetic acid-acetone-potassium permanganate oxidation of Kartha, and Bertram separation of hydrolyzed oxidation products remained unchanged during the fission of unsaturated fats by oxidation. Methods depending on the determination of iodine values will always register an apparent increase in saturated acid content during autoxidation. (*C. A.* **51**, 2307)

The composition of suint. T. Green and R. Preston(Wool Inds. Research Assoc., Torridon, Headingley, Leeds, Engl.). *J. Textile Inst.* **47**, T497–8(1956). It appears that the acids in suint, the aqueous extract of degreased wool, include: formic, acetic, propionic, butyric, oxalic, succinic, glutaric, adipic, pimelic, levulinic, alpha-ketoglutaric, pyruvic, phenylpyruvic, para-hydroxyphenylpyruvic, an unidentified keto acid, sulfuric, phosphoric, malic, citric, various sugar acids such as gluconic and uronic, and a small but significant amount of higher fatty acids. (*C. A.* **51**, 2307)

New edible oil refinery. Anon. *Ind. Chemist* **32**, 369–70(1956). The new Van den Berghs & Jurgens Ltd. edible oil refinery at Bromborough Port, Cheshire, is described. (*C. A.* **51**, 2308)

Refraction method for determination of the percentage of open cells in seed meats. G. I. Baglai(Oil-fat Combine, Dnepropetrovsk). *Masloboino-Zhirovaya Prom.* **22**(6), 7–9(1956). A refraction method for the determination of the percentage of opened cells in the pulp is described. Experimental data show its usefulness for determining whether the pulp is ready for pressing. (*C. A.* **51**, 2309)

Oxidized flavor in milk and procedures used for its prevention. G. Majer. *Österr. Milchw.* 11, 54–6, 68–9(1956). A review is given of the use of antioxidants for the prevention of oxidized flavor in milk caused by oxidation of the fats under the catalytic action of light and traces of metal. (*C. A.* **51**, 3056)

Evaluation of certain iodometric methods for the determination of peroxide number in fats and modifications of these methods. B. A. J. Sedlacek, R. Rybin, J. M. Raab, and M. Bartonicek (Zaklad Hig., Prague). *Roczniki Państwawego Zakladu Hig.* **7**, 293–302(1956). A review of existing method is followed by certain modifications suggested by the author. In the best method, a distillation flask is used with a reflux condenser and Bunsen valve. The latter does not permit the entrance of air during cooling. The reaction in the distillation flask is carried out in carbon dioxide atmosphere which is formed from acetic acid and sodium bicarbonate. (*C. A.* **51**, 3161)

Coefficient of diffusion of some vegetable oils. V. V. Beloborodov. *Zhur. Priklad Khim.* **29**, 1437–8(1956). The coefficient of diffusion D of vegetable oils in ligroine (containing primarily n-C_6H_{14} and n-C_7H_{16}) were determined at 20° by the analyses of 4 different layers. The values of D x 10^{-5} (sq. cm./sec.) of the following oils were: crude and refined cottonseed oil 0.71 and 0.70; crude sunflower oil 0.68; crude peanut oil 0.72; crude and refined linseed oil 0.68 and 0.67; crude soybean oil 0.59; crude and refined coreander oil 0.59 and 0.62 (*C. A.* **51**, 3161)

Losses of fat in the glycerol production process. Losses in the nonreactive method of fat hydrolysis. M. V. Irodov. *Masloboino-Zhirovaya Prom.* 22(6), 13–6(1956). The data show that less than 0.1% of fat was lost when a mixture of 200 g. each of distilled water and oil containing fatty acids of 280–2 molecular weight on the average was heated in a 1300 ml. autoclave up to 210–20°. Under these conditions an insignificant part of the glycerol was converted to formic acid owing to the catalytic effect of copper and aluminum in the apparatus. The losses of fat in the process were at a minimum. The color of the recovered fatty acids was significantly improved when both the oil and steam were deaerated prior to hydrolysis. (*C. A.* **51**, 1928)

The oil extracted from seeds of Thevetia nereifolia. R. Quilichini and M. Bertucat. *Bull. soc. pharm. Bordeaux* **95**, 61–4 (1956). The oil extracted from *T. nereifolia* shows $n^{20.4}$ 1.4682; d_{21} 0.912; saponification number 188; iodine number 77, and acetylation number 10–12. The oil is nontoxic, has a flavor resembling fresh almond oils, and is odorless. It should be used to replace almond or peanut oils. (*C. A.* **51**, 3162)

Extracting olive oil by means of electrophoresis. S. Castorina (Staz. sper. olivicolt. e oleificio, Pescara, Italy). *Olivicolt* **11** (7), 4–7(1956). The water-oil emulsion, as obtained by diluting the minced olive paste, is subjected to electrophoresis to break the emulsion complexes and separate the oil. (*C. A.* **51**, 1629)

Interaction of sugars with the albuminous matter of oil-bearing seeds in the course of oil manufacture. V. P. Rzhekhin. *Masloboino-Zhirovaya Prom.* 22(6), 3–6(1956). The data are presented to show that Maillard's reaction between sugars and protein increases with the temperature during the decoction process, and that Maillard reaction is at its minimum when oil is obtained by a solvent extraction method. (*C. A.* **51**, 1628)

Polymerization study by infrared spectrophotometry of some macromolecular products obtained from castor oil. D. Stefanescu and N. Stanescu (Fac. Matematici fiz., Bucharest). *Rev. univ. "C. I. Parhon" politehn. Bucuresti, Ser. stiint. nat.* **4** (8), 73–82(1955). On the basis of visible and near-infrared spectrophotometry, in the region 0.5 to 2.5 μ, the authors have established that polymerization products obtained from castor oil are polyesters and have a linear structure. (*C. A.* **51**, 741)

Characteristics of separate fractions of vegetable oil subjected to molecular distillation. N. I. Kozin and Yu. D. Zlatopol'skaya. *Sbornik Nauch. Rabot Moskov. Inst. Narod, Khoz.* **1954**(5), 35–42. *Referat. Zhur., Khim.* **1955**, No. 8622. A molecular still of Kogan, Savost'yanov, and Geshelin construction operating on the principle of the dropping film is described. With this apparatus, sunflower, linseed, soybean, and cottonseed oils were fractionated into 5–7 fractions in an interval of 150–270°. Each of these fractions is characterized by an acid number, percentage of unsaponifiable substances, iodine number and saponification number (*C. A.* 51, 1625)

Refractometry of fats. III. Polyphase refractometry of polymorphous cacao butter glycerides. H. P. Kaufmann, J. G. Thieme and U. Wohlert. *Fette, Seifen, Anstrichmittel* **57**, 21–4 (1955). Polyphase refractometry was used to study the crystal modifications of cacao butter. The pure *alpha, beta*$_1$, and *beta* forms were characterized refractometrically, and it was possible to determine the percentage of one form in a mixture of two. The authors also calculated the rate of transformation of unstable to stable modifications and defined conditions for obtaining the most stable forms. (*C. A.* **51**, 1628)

Oxidation of oleic and elaidic acids. N. P. Bulatskii. *Trudy Odessk. Univ., Sbornik Khim. Fakul'teta* 3, 33–6(1953). The relationship between the reactive power of a double bond in unsaturated compounds and their special configuration was studied on the oxidation of oleic and elaidic acids. The oxidation of oleic acid in acetone by aqueous potassium permanganate was faster than the oxidation of its *trans* isomer. (*C. A.* **51**, 1832)

Seasonal variations in the Reichert and iodine values of milk fat. S. R. Sampath and C. P. Anantakrishman (Natl. Dairy Inst., Bangalore). *Indian J. Dairy Sci.* **9**, 135–41(1956). Monthly variations in the Reichert and iodine values of cow and buffalo milk fat are statistically significant. The Reichert values of cow milk fat are significantly lower than those for buffalo milk fat, but the iodine values are not significantly different. (*C. A.* **51**, 2198)

Fat and water content in the edible portion of the rosefish (Sebastes marinus). C. H. Brandes and R. Dietrich (Inst. Meeresforsch., Bremerhaven, Ger.). *Fette, Seifen, Anstrichmittel* **58**, 433–9(1956). As in the case of the herring, a good correlation exists between the fat and water content of the edible portion of the rosefish; this correlation is not influenced by the biological state of the fish. By means of a correlation factor the fat content can be calculated from the analytically determined water content with an accuracy of 0.65%. (*C. A.* **51**, 2199)

2-Thiobarbituric acid method for the measurement of rancidity in fishery products. T. C. Yu and R. O. Sinnhuber (Oregon Agr. Exptl. Sta., Seafoods Lab., Astoria, Oregon). *Food Tech.* **11**, 104–8(1957). The modified 2-thiobarbituric acid method described in this paper was found to be an effective means for the determination of oxidative rancidity in a wide variety of fishery products. The oxidation of fat in fish meal, fish oil, fresh and frozen fish was satisfactorily determined by this procedure. The reaction is performed on the intact sample eliminating the difficult extraction which is necessary in many rancidity methods. The results indicate that this method may be used as an index of quality of stored fishery products.

Improvement of food flavor, fat stability, and nutritional value with sesame products. E. F. Glabe, P. W. Anderson, and A. F. Holtorff (Food Technology, Inc., Chicago). *Food Tech.* **11**, 185–8(1957). Grinding of the heat-processed seed releases the oil and yields a flavor-rich product which is high in antioxidant value. Several food products besides bread and other baked articles present possible opportunities for application of the flavor and other properties of heat treated sesame.

Urea adducts with fatty compounds. XI. Complexes with aliphatic diesters. J. M. Martinez Moreno, A. Vasquez Roncero, C. Janer, F. Mazuelos, J. Ruiz Cruz, and M. L. Janer. *Grasas y Aceites* **7**, 285–293(1956). Urea adducts of several members of the following series were prepared and their composition determined: symmetrical and unsymmetrical diglycerides; 1-3 propanediol esters; glycol diesters; diesters of the diacids oxalic, malonic, succinic, glutaric and adipic.

It is shown that the composition of these series of urea adducts cannot be satisfactorily explained by the structure commonly accepted for adducts of monofunctional compounds.

Recent improvements in the edible fats field. J. P. Sisley. *Olii Minerali-Grassi E Saponi-Colori E Vernici* **33**, 423–432 (1956). The author presents a general view of the latest progress in the field of edible fats. He then discusses the new technical findings concerning the following: fatty material extraction, demucilagination, deacidification, bleaching, deodorization, separation by selective solvents, hydrogenation, interesterification and chain migration; antioxidants, natural antioxidants, synergetic and sequestering substances. Sisley emphasizes the fact that the progress achieved during the last 30 years in the fats field, is due to the large number of studies carried on during that time. Fats are now to be considered as raw materials for further processing; seldom are they utilized in the form in which they are produced.

Solvent extraction of wax and ursolic acid from cranberry skins. L. K. Arnold and P. R. Hsia (Iowa Engineering Experiment Station, Iowa State College, Ames, Iowa). *Ind. Eng. Chem.* **49**, 360–363(1957). Cranberry skins were extracted in a continuous countercurrent solvent extraction pilot plant by trichloroethylene and ethylene dichloride to remove a mixture of waxes and ursolic acid. Because of the low solubility of the solute, a solvent-feed ratio of 25 was found to be desirable. The skins were extracted by the conventional method by trichloroethylene and by a cyclic process involving reuse of the solvent by trichloroethylene and ethylene dichloride. In this cyclic process the hot solution from the extractor was cooled to precipitate part of the solute and then heated and used as a solvent.

Process for preparing hard butter. W. M. Cochran and M. L. Ott (The Glidden Co.). *U. S. 2,783,151.* A process is described for preparing a hard butter by the rearrangement of a mixture of triglyceride oils at temperatures below 250°F. in the presence of less than 1% of a low temperature rearrangement catalyst. After the reaction is completed and the catalyst has been inactivated, the product is treated with a sufficient quantity of higher fatty acids to replace lower fatty acids and achieve the desired composition. If necessary, the mass is hydrogenated until the iodine value is below 20.

Tallow color stabilization. R. J. Sims and DeW. Nelson (Swift & Co.). *U. S. 2,783,256.* Color reversion of tallow is inhibited by decolorizing the tallow with propane and immediately adding a small quantity of hexamethylenetetramine.

Deodorization of hydrogenated fatty oils. D. R. Merker (Swift & Co.). *U. S. 2,783,260.* Hydrogenation odors and flavors are removed by adding at least 0.5% by wt. of concentrated phosphoric acid to the oil and heating the mixture at 60° to 95° for at least ½ hr. with aeration and agitation. Bleaching earth is added and the temperature is increased to 130–140°. Agitation and heating are continued for at least ½ hr. after which the mixture is cooled and filtered.

Treatment of wash waters from alkali oil refining. M. B. Foley (A. E. Staley Manufacturing Co.). *U. S. 2,784,161.* Wash water from the alkali refining of vegetable oils is treated to recover fatty acids and to lower the B.O.D. volue. The wash water is maintained at temperatures between 140° and 160°F. while 25 to 30 grains of lignin are added to each gallon of water. The mixture is then acidified to pH 2.0 to 3.0 and the bottom phase is separated from the supernatant fatty layer.

Improving cottonseed oil while preparing the seed for oil extraction. W. H. King and F. H. Thurber (U. S. A., Secy. Agr.). *U. S. 2,784,205.* Cottonseed meats containing free gossypol are treated so that gossypol is changed to a water-soluble, oil-insoluble form. The flaked raw meats are mixed with 0.5 to 2.5% by wt. of aqueous alkali metal hydroxide. The moisture content is thereby increased 15 to 25%. The mixture is cooked at gradually rising temperatures between 170° and 235°F. until the moisture content has been reduced 4 to 11%. Cottonseed oil from the resultant meats has little tendency to undergo color reversion.

Coating composition. H. T. Thielke. *U. S. 2,784,891.* A gas- and moisture-proof container having heat-sealed seams is prepared from paper that has been coated with a homogeneous mixture of 25 to 55% polyethylene, 15 to 30% rubber, and 25 to 50% hydrogenated fat.

Domestic appliance. E. J. Frey (General Motors Corp.). *U. S. 2,785,132.* A thermo-responsive device is made from an expansible element capable of operating the device and a thermo-responsive material having an expansion of 0.004 inch per inch within a melting range of 90° to 110°F. The thermo-responsive material is a mixture containing 40 to 90% of lauric acid by weight and the remainder myristic, palmitic and stearic acids.

Process for treating tall oil with urea. M. H. Gorin and L. Rosenstein. *U. S. 2,785,151.* A process is described for recovering straight chain fatty acids, having more than 10 carbons, from their solution in a hydrocarbon. Expanded urea is added to the fatty acid solution at a temperature below 75° and the solid adduct is separated. The hydrocarbon is one which does not form a solid adduct with urea and is not a solvent for urea.

Extraction of sesame. R. H. Purdy and J. A. Kneeland (Pacific Vegetable Oil Corp.). *U. S. 2,786,063.* Unsaponifiable compounds are extracted from sesame or sesame oil by treatment with a C_2 to C_4 alkyl nitrile, and are recovered in the usual manner from the upper nitrile phase.

Adipic acid crystallization. E. I. du Pont de Nemours & Co. *Brit. 745,063.* Best conditions for the continuous crystallization of adipic acid comprise a saturated solution containing by-product dibasic acids at an elevated temperature, e.g. crystallization of a supersaturated solution containing 8–18% dibasic acids is carried out at 35–70°. Both the dibasic acids and higher temperature depress nucleation and this effect improved crystal formation. (*C. A.* 51, 1255)

Lactones for flavoring margarine. J. Boldingh, Pauline H. Begemann, G. Lardelli, R. J. Taylor and W. T. Weller (Unilever Ltd.). *Brit. 748,661.* The lactone of δ-hydroxydodecanoic acid is prepared and can be used for imparting a butter-like flavor to foodstuffs.

Lactones for flavoring margarine. R. J. Taylor and Wm. T. Weller (Unilever Ltd.). *Brit. 748,801.* Lactones of saturated straight chain aliphatichydroxycarboxylic acids containing between 9 and 14 carbon atoms for imparting a butter-like flavor to margarine. (*C. A.* 51, 462)

Nickel catalyst for isomerizing unsaturated fatty acids and their derivatives. Unilever N. V. *Dutch 79,307.* The catalyst used for isomerizing unsaturated fatty acids or their derivatives is prepared by precipitating a solution of a nickel salt with a basic compound in the presence of SiO_2-containing material, such as kieselguhr or water glass, drying the precipitate and reducing it in a hydrogen atmosphere with the addition of sulfur or a sulfur compound. Instead of adding sulfur, elemental Se and (or) Te or Se or Te compounds are added. (*C. A.* 50, 17490)

Bleaching palm oils. Joseph Cres. *Fr. 1,000,296.* The palm oils to be decolorized are heated to 90–100° and 1 kg. finely granulated zinc is then added per 1,000 kg. oil, the zinc granules having first been soaked in the cold in distilled water containing 3 g. copper sulfate per 5 l. and then dried. The hot oil containing the impregnated zinc granules is agitated in the presence of air until sufficient decolorization is attained. (*C. A.* 51, 3163)

Saponification of hydrocarbon sulfonyl chlorides. G. Fischer, K. H. Imhausen, G. Renckhoff, and S. Schurrmann (Imhausen & Co., G.m.b.H.). *Ger. 950,635.* Sulfonyl chlorides resulting from the sulfochlorination of hydrocarbons with sulfur dioxide and chlorine are, preferably after emulsification with water, slowly treated with sufficient saponification agent, e.g. potassium or sodium hydroxide, for partial saponification so that the reaction medium is adjusted to an approximately neutral pH. The organic layer, composed of unsaponified and unsaponifiable constituents, is separated from the aqueous phase and is treated with additional saponification agent to complete the saponification. The poly(sulfonyl chlorides) are essentially saponified in the first step whereas the organic layer is enriched in monosulfonyl chlorides. (*C. A.* 51, 1631)

Powdered fats and oils. Tochio Iguchi, *et al.* (Taiyo Fats and Oils Co.). *Japan. 978('55).* Refined coconut oil (20 parts) at 40° is treated dropwise on a rotating disk (9,000–11,000 r.p.m.) is a spray-drying chamber at —5° to obtain 19 parts powdered coconut oil, m.p. 34°. (*C. A.* 50, 17490)

Separation of sterols from fats and oils. Hideo Marumo, Akira Nakajima, and Shimichi Tomiyama. *Japan. 979('55).* Methanolysis of 1,000 parts cuttlefish oil (2.46% unsaponifiable substance of which 36.4% is cholesterol) for 4 hours at 60–70° with 1,000 parts methanol and 22 parts sulfuric acid and distilling off the product b.p.$_{2.5}$ 220° yielded 71 parts of a residue. This was refluxed for 2.5 hours at 60–70° with sodium methoxide, the product let stand overnight at 10°, filtered, and recrystallized from methanol to give 7 parts of cholesterol, m.p. 142.5°. (*C.A.* 50, 17490)

Refining of fats and oils. Shuichiro Kimoto. *Japan 1077('55).* One hundred parts of a mixture of equal weights of benzene and crude cottonseed oil with an acid number of 20 is treated with 20° Bé sodium hydroxide at 20° in a closed container. The benzene in the upper layer when removed gives 43 parts refined oil. The lower sludge layer is treated with 2 parts of 30% sulfuric acid and heated to recover 10 parts benzene and oil. The total loss of benzene is 0.3%. *Japan 1078('55).* Decolorization of refined oil in the solvent is accomplished by treating it with a decolorizing agent, e.g. activated earth or carbon. (*C. A.* 50, 17490)

Hydrogenation of fish oils. Seiichi Itakura. *Japan. 1079('55).* The vessel containing fish oil and the hydrogenation catalyst, e.g. Fe, Ni, or Raney Ni, is equipped with coil of Fe or Cu wire. Direct current at 50 v. and 1 amp. is passed through the coil in order to produce a magnetic field in the vessel and to cause rapid motion of the magnetized catalyst during the hydrogenation at 60–190°. (*C. A.* 50, 17491)

Refining of squalene and fish-liver oil. Yasota Kawakami (Kawakami Research Inst., Ltd.). *Japan. 1740('55).* Crude squalene is made into an odorless oil with a cloud point of —14° by mixing with a sodium dispersion in benzene. The product is fractionated to give 85% of a main fraction, boiling point at 1 mm. 170–200°. An odorless oil can also be obtained from fish-liver oil by this method. (*C. A.* 51, 744)

FATTY ACID DERIVATIVES

Synthesis of δ-formylvaleric acid. Kazuyoshi Naganuma and Eiko Ueda(Ootsuma Women's Univ., Tokyo). *Japan J. Nutrition* **9**, 157–8(1952). Diethyl adipate (20 g.) was reacted with 12 g. ethyl formate and 3 g. sodium to give 65% diethyl-α-formyladipate, 3 g. of which was heated 2 hours at 130° with 15 ml. water to give 54% α-formylvaleric acid, b.p. 77.5°. (*C. A.* **50**, 16674)

Hydrogenation of fatty nitriles using a nickel borate catalyst. D. E. Terry and J. L. Jakobsen(General Mills, Inc.). *U. S.* 2,784,232. Fatty amines are produced from C_8 to C_{22} nitriles by reduction at 110° to 230° with hydrogen in the presence of a reduced nickel borate catalyst.

Aldonyl amides of amino acid esters. J. J. Jonas(National Dairy Products Co.). *U. S. 2,785,152.* The preparation is described of N-aldonyl C_{12} to C_{18} alkyl esters of the α-amino carboxylic acids from casein. A typical product is the N-lactobionyl stearyl esters of the amino acids from hydrolyzed casein.

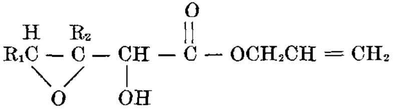
Preparation of sulfonated fatty acid nitriles. B. Blaser and G. Tischbirek(Henkel & Cie. G.m.b.H.). *U. S. 2,785,193.* A nitrile of a saturated C_8 to C_{25} fatty acid is treated with a sulfonation agent such as sulfur trioxide or sulfur trioxide ether adducts. The reaction is conducted at temperatures below 60°.

Production of surface active compounds. W. J. F. deR. V. D. Gracht(Lever Bros. Co.). *U. S. 2,785,978.* An emulsifier is prepared by reacting an estolide of an unpolymerized aliphatic C_{12} to C_{20} hydroxycarboxylic acid (having an acid number below 70) with a polycondensed polyhydric C_3 to C_8 alcohol at 180° to 210° until the acid number drops below 10. This emulsifier may be used in the preparation of a fluid chocolate coating for food products from a mixture of cocoa butter, sugar and cocoa solids.

Diepoxides of cycloaliphatic esters of monoethylenic fatty acids. F. C. Frostick, Jr. and B. Phillips(Union Carbide and Carbon Corp). *U. S. 2,786,066.* The preparation of these compounds is described.

Triepoxides and process for making them. F. C. Frostick, Jr. and B. Phillips(Union Carbide and Carbon Corp.). *U. S. 2,786,067.* The preparation of triepoxides of cycloaliphatic esters of diethylenic fatty acids is described.

Process for the preparation of allyl 3,4-epoxy-hydroxyalkanoates. F. C. Frostick, Jr. and B. Phillips(Union Carbide and Carbon Corp.). *U. S. 2,786,068.* Preparation of the following types of compounds is described:



$$R_1\overset{H}{C}-\overset{R_2}{C}-\underset{OH}{CH}-\overset{O}{\overset{\|}{C}}-OCH_2CH=CH_2$$

wherein R_1 and R_2 may be hydrogen or a lower alkyl group.

Separation of saturated and unsaturated higher alcohols. Ichiro Sakai(Nippon Marine Industries Co.). *Japan, 1369('55).* A higher alcohol (4.9 g.) from sperm oil and 24 ml. liquid ammonia are shaken at 0° in a closed container, the precipitate is filtered, washed with liquid ammonia, and the ammonia is removed to give 1.6 g. precipitate with iodine number 0.07 and 2.7 g. of an ammonia soluble portion with iodine number 82.8. (*C. A.* **50**, 17491)

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• Biology and Nutrition

Oxidation of linoleic acid in the presence of 20-methylcholanthrene. G. G. Tedeschi and A. De Cicco(Univ. Rome). *Ricerca sci.* **26**, 1499–505(1956). In connection with the carcinogenic action of methylcholanthrene, its catalytic behavior toward oxidation of linoleic acid was studied. Ethyl linoleate suffered a rapid loss of Wijs iodine number and rise in peroxide content when treated simultaneously, but not separately, with ultraviolet rays and 0.001 *M* of 20-methylcholanthrene. Similarly it was found that linoleic acid neutralized with ammonium hydroxide and phosphate buffer to pH 7 reacted with hydrogen peroxide in the dark, but twice as fast when a colloidal aqueous solution of methyl cholanthrene in ethyl ether was added. (*C. A.* **51**, 206)

The plasma lipides following X-ray irradiation. Dorothy L. Fillerup, W. H. Slaton, Jr., and J. F. Mead(Univ. of Calif. Los Angeles). *U. S. Atomic Energy Comm.* **UCLA-336,** 12 pp.(1955). Chromatographic analysis of the plasma lipides of rats following 800 or 1200 r. of X-ray irradiation reveals decreased percentages of triglyceride and free sterol with increased sterol ester and phospholipid as compared with normal-fed animals. These changes are not significantly different from those found during a 24-hour fast. Plasma total lipide values varied widely but were within the normal range. (*C. A.* **51**, 510)

Biochemistry of the inositols. E. Chargaff(Columbia Univ.). *Soc. Biol. Chemists, India* **1955**, 222–6. A review and discussion. (*C. A.* **51**, 512)

Parenteral administration of fat emulsions. R. Tritapepe(Univ. Milan). *Atti soc. lombarda sci. med. e biol.* **11**, 30–2(1956). Fats were emulsified by high pressure so that particles were not larger than 1μ. Emulsifying agents used were Tween 80, Span 20, gelatin or polyvinyl pyrrolidone; the fats were olive oil and coco fat. Intravenous injections caused cardiovascular changes of varying severity in dogs. Subcutaneous administration was well tolerated and some dogs were maintained exclusively by this method for periods of 12 days without loss of weight. (*C. A.* **51**, 1398)

The absorbability of natural and modified fats. Doris H. Calloway and G. W. Kurtz with J. J. McMullen and L. V. Thomas (Quartermaster Food and Container Inst. for the Armed Forces, Chicago). *Food Res.* **21**, 621–9(1956). When natural fats were fully hydrogenated, digestibility varied inversely in linear fashion with the chain length of the constituent fatty acids and in curvilinear fashion with the amount of saturated acids C_{18} and above. The general inverse linear relation between digestibility and melting point is ascribed to the relationship which exists between the melting point and the amount of component fatty acids. The monoglyceride of hydrogenated lard was found to be more digestible than the original triglyceride. Substitution of one-third of the fatty acid radicals by butyryl groups was equally effective in raising digestibility; while simple mixture of tributyrin with hydrogenated lard showed no effect. Digestibility of mannitol esters of lards was similar to that of the glyceride lards from which they were made, indicating that digestibility was a function of the constituted fatty acirs. It is concluded that digestibility is primarily dependent upon the amounts and chain length of the saturated fatty acids and their arrangement within the glyceride structure.

Lipide changes in regenerating cartilage. S. Briganti(Univ. Palermo, Sicily) and S. Milazzo. *Patol. sper.* **43**, 402–8(1955). By histochemical observations on dog ear cartilage, surgically treated to cause an increase of functional activity, a fat increase was noted. The authors think that the cartilage cell gets from fat the energy necessary for the regeneration. (*C. A.* **51**, 2983)

The community problem in coronary heart disease: a challenge for epidemiological research. D. C. Miller, F. J. Stare, P. D. White and J. E. Gordon(Harvard Univ. School of Public Health, Boston, Mass.). *Am. J. Med. Sci.* **232**, 329–59(1956). A review with 223 references. Diet and serum cholesterol levels are among the etiological factors discussed and special significance is attributed to the causative role of highly saturated fats in the diet. (*C. A.* **51**, 2140)

Physical activity and the diet in populations differing in serum cholesterol. A. Keys, J. T. Anderson, M. Aresu, G. Biörck, J. F. Brock, B. Bronte-Stewart, Flaminio Fidanza, Margaret H. Keys, H. Malmros, A. Poppi, T. Posteli, B. Swahn, and A. del Vecchio(Univ. of Minnesota, Minneapolis). *J. Clin. Invest.* **35**, 1173–81(1956). Data on total serum cholesterol are presented for men classified by age and physical activity in Minnesota, Malmo, Sweden, Bologna, Naples, the Island of Sardinia, and 3 ethnic groups in South Africa. Data on the cholesterol in the serum *beta*-lipoprotein fraction are presented for some groups. Differences in physical activity do not explain the large differences in serum cholesterol found when groups of different dietary habits are compared. Within some populations, there is a tendency for men in heavy manual labor to have somewhat lower cholesterol values than other men in the population. Among the Bantu, who show this tendency most prominently, the men in heavy work consume diets lower in fats than do the other Bantu. It is concluded that the habitual diet, and especially its fat content, has much more influence than the physical activity per se, on the concentration of the total cholesterol and *beta*-lipoprotein cholesterol in the blood stream. (*C. A.* **51**, 2140)

Intestinal absorption of cholesterol. G. Corsini(Univ. Pisa, Italy) and L. Guacci. *Arch studio fisiopatol. e clin. ricambio* **19**, 364–73(1955). By means of cholesterol administration to 10 healthy individuals, by mouth, in doses from 5 to 80 g., it was shown that the intestinal cholesterol absorption is very slight. (*C. A.* **51**, 2982)

Uncertainties in the measurement of total cholesterol in serum —choice of an accurate method. P. M. de Traverse, G. H. Lavergne and R. Depraitière(Hôsp. Cochin Clin. Med. Hôsp., Saint-Antoine, France). *Ann. biol. clin. (Paris)* **14**, 236–56 (1956). The total cholesterol content of the blood remained fairly constant up to 5 days upon storage at 20° whether separated from or remaining with the cells. Extraction with a solvent-serum ratio of 56:1 instead of 28:1 gave higher cholesterol values. The kinetics of the Libermann reaction were studied as a function of (a) the concentration of cholesterol (b) quantity of sulfuric acid used (c) proportion of acetic acid in the acetic anhydride (d) reaction temperature and (e) wave length. Saponification of the cholesterol extract gave somewhat lower values than from the non-saponified extract. An improved method for the accurate determination of total serum cholesterol is given. (*C. A.* **51**, 533)

Dietary protein and serum cholesterol in rats. A. W. Moyer, D. Kritchevsky, J. B. Logan and H. R. Cox (Am. Cyanamid Co., Pearl River, N. Y.). *Proc. Soc. Exptl. Biol. Med.* **92**, 736–7 (1956). Increasing the protein content of several diets of groups of rats on a normally hypercholesterolemic regimen caused a progressive drop in serum cholesterol values. All diets except one contained added choline chloride. Rats on the choline-free diet had lower serum cholesterol levels and higher liver cholesterol than a comparable choline-fed group. (*C. A.* **51**, 1397)

Fat-soluble vitamins and artherosclerosis. G. Weitzel (Max Planck Gesellschaft, Göttingen, Ger.). H. Schoen, F. Gey, and E. Buddecke. *Hoppe-Seyler's Z. physiol. Chem.* **304**, 247–72 (1956). Old atherosclerotic hens were given large oral doses of vitamins K_1, A and E for periods between 75 and 100 days. Vitamin K_1 was found to have no effect on artherosclerosis in the case of old hens or of young cockerels fed with cholesterol. A slight antiatherosclerotic effect was observed with vitamin E in a few cases with very large doses. With vitamin A, on the other hand, macroscopic examination showed a marked regression of the atheromatosis in all the test groups. The combined administration of vitamins A and E was found to be the most effective and produced a very considerable diminution of the fat plaques and of the total fat and cholesterol content of the aorta. The vitamins A and E groups, and in some cases the vitamin A group alone, showed a striking shift in the composition of the cholesterol fractions in the liver in favor of the cholesterol esters. (*C. A.* **51**, 567)

A note on the infrared spectra of α-cephalins. *Can. J. Biochem. & Physiol.* **35**, 239–240 (1957). E. Baer (National Research Council, Ottawa). The infrared spectra of dimyristoyl, dipalmitoyl, and distearolyl L-α-cephalin were obtained by use of a Perkin-Elmer Model 21 spectrophotometer by use of the KBr technique of putting the compound in KBr and then pressing the disk under pressure. All three spectra are shown in this article.

Biosynthesis of fatty acids in cell-free preparations. 4. Synthesis of fatty acids from acetate by a partially purified enzyme system from rabbit mammary gland. Priscilla Hele, G. Popjak, and Monique Lauryssens (Med. Res. Council, Exptl. Radiopathology Res. Unit, Hammersmith Hosp., London, W. 12). *Biochem. J.* **65**, 348–363 (1957). A partially purified enzyme preparation has been obtained from lactating rabbit mammary gland that catalyses the synthesis of even-numbered-chain fatty acids from C_4 to C_{18}, with the shorter chain fatty acids preponderating. This synthesis is achieved from acetate, coenzyme A (CoA), adenosine triphosphate and stoicheiometric amounts of reduced diphosphopyridine nucleotide (DPNH). The findings strongly suggest that fatty acid synthesis in these enzyme preparations takes place by a stepwise condensation of C_2 units, through the reversal of the now well-established β-oxidation of even-numbered-chain fatty acids.

Steroid utilization and fatty acid synthesis by the larva of the housefly Musca vicina Macq. Z. H. Levinson and E. D. Bergmann. *Biochem. J.* **65**, 254–260 (1957). Housefly larvae are able to synthesize body fat from ditary protein, and they require neither fatty acids nor carbohydrate in the medium. Furthermore, they reproduce normally without any dietary source of fat during larval and adult life. Cholesteral in quantities of 2 μg./g. of diet stimulates growth of housefly larvae. Larval growth is proportional to the concentration of dietary cholesterol, up to a certain limit. Excess of cholesterol in the diet has no adverse effect. The influence of steroid structure on the utilizability has been studied. It has been found that some steroids are not only not utilized, but they inhibit the utilization of other steroids. Cholesterol utilization by housefly larvae is reversibly inhibited by cholesteryl chloride. The utilization of steroids by insects is discussed in connection with their feeding habits.

Action of phospholipase A on ovolecithin. C. Long and I. F. Penny (Dept. Biological Chem., Univ. Aberdeen). *Biochem. J.* **65**, 382–389 (1957). The enzymic degradation of ovolecithin and certain other phosphoglycerides in etheral solutions by snake venom phospholipase A is stimulated by Ca^{++} ions. The optimum Ca^{++} ion concentration varies between 40 and 80 μM, when the lecithin concentration varies between 1.3 and 3.3 mM. All natural and synthetic L-α-lecithins studied lost one ester group/molecule of substrate in the presence of the enzyme. Synthetic DL-α-lecithins lost only 0.5 mole of ester/molecule of substrate, whereas synthetic β-lecithins did not undergo any enzymic hydrolysis. Egg phosphatidylethanolamine was degraded by phospholipase A when the ethereal solution was adjusted to pH 7.0, and there is some evidence for the breakdown of phosphatidylserine and ethanolamine plasmalogen. Inositol phosphoglycerides were not attacked by moccasin-venom phospholipase A.

The effect of various levels of dietary protein upon the volatile fatty acids in the rumen of the dairy cow. R. F. Davis, N. S. Woodhouse, M. Keeney and G. H. Beck (Dairy Dept., Univ. of Maryland, Collegee Park). *J. Dairy Sci.* **40**, 75–80 (1957). Nine lactating cows were fed three levels of protein in a change-over design experiment. Samples of rumen liquor were obtained on three consecutive days, centered on 13 and 20 days of feeding each ration. Increased amounts of all volatile fatty acids except ''higher acids'' were observed as a result of high levels of protein intake. Increasing the protein allowance caused a decrease in the percentage of acetic acid and ''higher acids'' and an increase in the percentage of butyric acid present in the total volatile fatty acids in the rumen.

The structure and reactions of gossypol. IV. The synthesis of desapogossypol hexamethyl ether. D. A. Shirley and W. L. Dean (Dept. of Chem., Univ. of Tennessee). *J. Am. Chem. Soc.* **79**, 1205–1207 (1957). 1,1′, 6,6′, 7,7′-Hexamethoxy-3,3′-dimethyl-2, 2′-binaphthyl has been synthesized and found to be identical with desapogossypol hexamethyl ether, a degradation product of gossypol.

The origin of serum cholesterol in the rat: diet versus synthesis. M. D. Morris, L. L. Chaikoff, J. M. Felts, S. Abraham, and N. O. Fansah (Dept. of Physiology of the Univ. of Calif. School of Medicine, Berkeley, Calif.). *J. Biol. Chem.* **224**, 1039-1045 (1957). For varying periods up to 6 weeks, rats were fed a diet containing either 0.05 or 2.0 per cent cholesterol. The dietary cholesterol was labeled by admixture with cholesterol-4-C^{14}. At the end of the feeding periods the specific activities of serum cholesterol were determined. Maximal specific activities of serum cholesterol occurred in 2 weeks, or earlier, in the rats fed the 2 per cent, but 4 weeks were required for this to occur in the rats fed the .05 per cent cholesterol diet. It was estimated, from the ratio of the specific activity of the serum cholesterol to that of the dietary cholesterol, that, in the rats fed the low cholesterol diet, synthesis contributed from 67 to 80 per cent to the composition of serum cholesterol. In those fed the high cholesterol diet, from 10 to 26 per cent of serum cholesterol was derived from synthesis.

The separation of stigmasterol from soybean sterols. J. A. Campbell, D. A. Shepherd, B. A. Johnson and A. C. Ott (Research Lab., The Upjohn Co., Kalamazoo, Michigan). *J. Am. Chem. Soc.* **79**, 1127–1129 (1957). Several new esters of stigmasterol and a new process for the isolation of stigmasterol of about 88% or better purity from soybean sterol *via* the α-naphthylcarbamates are described.

Fat studies in poultry. 6. Utilization of fats of different melting points. B. March and J. Biely (Poultry Nutrition Lab., Univ., of British Columbia, Vancouver, B. C., Canada). *Poultry Sci.* **36**, 71–75 (1957). Corn oil, tallow and hydrogenated animal fat were studied as supplements to chick rations. Corn oil and tallow were well utilized by the chick. The coefficients of digestibility were not so high as those reported in the literature because fatty acids excreted in the form of soaps were taken into account in the present experiments. When fed at the 12 percent level the values obtained were approximately 90 percent for corn oil and 73 percent for tallow. Two samples of hydrogenated animal fat fed at the 12 percent level were utilized only to the extent of 44 and 23 percent respectively.

In vitro conversion of zymosterol and dihydrozymosterol to cholesterol. J. D. Johnston and K. Bloch (Converse Memorial Lab. of Harvard Univ., Cambridge, Mass.). *J. Am. Chem. Soc.* **79**, 1145–1149 (1957). C^{14}-zymosterol, prepared by incubation of yeast with labeled acetate, is shown to be converted to cholesterol by homogenates of rat liver. The process requires aerobic conditions and both the particulate fraction and the supernatant or liver homogenates. 24,25-Dihydrozymosterol can be transformed to cholesterol, but this reaction does not appear to occur normally in cholesterol biogenesis.

Lipides of cytochrome oxidase. G. V. Marinetti, D. J. Scaramuzzino, and E. Stotz(Dept. of Biochemistry, Univ. of Rochester, N. Y.). *J. Biol. Chem.* 224, 819–826(1957). The lipide composition of a purified cytochrome oxidase preparation was determined and found to contain 33 per cent total lipides (dry weight). The lipides consist of 14.7 per cent phospholipide, 12.8 per cent neutral fat, 1.08 per cent free cholesterol, and 3.12 per cent unidentified lipides. The predominant phospholipides were lecithin and phosphatidyl ethanolamine. The possible function of lipides in biological oxidation is discussed.

Metabolism of essential fatty acids. V. Metabolic pathway of linolenic acid. G. Steinberg, W. H. Slaton, Jr., D. R. Howton, and J. F. Mead(School of Medicine, Univ. of California, Los Angeles, Calif.). *J. Biol. Chem.* 224, 841–849(1957). The polybromo fatty acids isolated from rats which had been fed methyl linolenate-1-C^{14} were isolated, debrominated and hydrogenated. Degradation by 1-carbon steps of the arachidic acid separated from the resulting saturated fatty acids revealed that its unsaturated precursor had been formed from linolenate by the addition of acetate to the carboxyl end. However, linolenate carbon did not contribute appreciably to the linoleic acid isolated from these rats, and indirect evidence was obtained which indicated that linolenate is converted, not to arachidonic, but to a different polyunsaturated acid, possibly eicosapentaenoic acid.

Metabolism studies with radioactive vitamin A. G. Wolf, S. G. Kahn, and B. C. Johnson(Radiocarbon Lab. and Division of Animal Nutrition, Univ. of Illinois, Urbana, Ill.). *J. Am. Chem. Soc.* 79, 1208–1212(1957). Vitamin A was synthesized with C^{14} in carbon number 2. Upon injection into rats, the radioactivity distribution in expired CO_2, organs and excreta was determined. The distribution of activity between vitamin A and its esters in liver was ascertained; no vitamin A aldehyde could be detected. A considerable fraction of radioactivity was found to be excreted as water-soluble compounds in urine. The principal one was characterized as an unconjugated ketoester.

The use of synthetic β-carotene for coloring butter. R. R. Riel and C. K. Johns(Canada Dept. of Agriculture, Ottawa, Canada). *J. Dairy Sci.* 40, 192–199(1957). Synthetic β-carotene was compared with coal-tar color as a coloring agent for butter. With a view to duplicating commercial conditions, the comparison was made at two levels of cream quality, two levels of copper and at three periods of storage. Neither official graders nor a taste panel could detect any flavor difference between the two types of butter. Acid degree, peroxide, and aldehyde values were the same for both types of butter, although copper and storage increased the degree of oxidation. Standardizing the color of butter with 0.35 g. of synthetic β-carotene per 100 lb. of fat gave a slightly deeper color than with 1 oz. of coal-tar color per 100 lb. of fat. The color intensity of the butter did not change during storage. The average vitamin A potency of the butter was increased 3800 I.U. per lb. as a result of coloring the butter with synthetic β-carotene and was not affected by storage.

Utilization of vitamin A activity from alfalfa or fish oil by chicks receiving diets with and without diphenyl-p-phenylenediamine (DPPD). W. J. Monson, E. T. Gade, M. D. Lloyd and A. C. Groschke(The Borden Co., Elgin, Illinois). *Poultry Sci.* 36, 166–170(1957). Under the conditions employed, diphenyl-*p*-phenylenediamine (DPPD) increases liver size and liver storage of vitamin A in chicks fed diets containing vitamin A oil or graded levels of alfalfa as the only vitamin A sources.

Method of adding fat to feed. S. Feld. *U. S. 2,784,093.* Fat is added to comminuted animal and stock feed in the form of toasted bread crumbs that have been impregnated with the fat.

Flavoring material. C. W. McMath(The Buckeye Cellulose Corp.). *U. S. 2,785,983.* The preparation is described of a stable non-caking solid seasoning in the form of small friable grains. Between 0.5 and 25% of an extract of a pungent aromatic spice is dissolved in a molten hard fat, having a melting point of 120° to 200°F. The mixture is spray cooled to form grains melting above 115°F.

Emulsifier compositions and insecticidal emulsions. R. W. Behrens(Atlas Powder Co.). *U. S. 2,786,013.* An insecticidal concentrate is prepared to contain about 60% by wt. of toxaphene, 5 to 15% of an emulsifier, and kerosene. The emulsifier consists of 30 to 45%by wt. of a lauric acid amide of anhydrized N-methyl glucamine and 70 to 55% by wt. of tetra- to hexatall oil esters of a polyoxyethylene ether of a hexitol.

• Drying Oils and Paints

Radiotracer studies of analytical methods for styrenated oils and esters. E. G. Bobalek, J. R. Bradford, F. Leutner, and R. Akiyama(Case Inst., Cleveland). *Anal. Chem.* 28, 906(1956). Most analytical methods for styrenated paint vehicles fail to separate neutral polystyrene and the oil-acid-styrene copolymer. Armitage and Kut's method for such fractionation, which depends on differential solubility of the copolymer's calcium soaps and neutral polystyrene in wet ethyl acetate, was investigated using radiotracer techniques in polymers prepared from styrene tagged on the *alpha*-carbon with carbon-14. This procedure does not always work. Apparently no method yet exists for determining polymeric species without supplementary analysis of the separated fractions. Fractionation data suggest that extensive copolymerization of styrene and fatty acids can occur, but that its extent varies with conditions of resin synthesis.

Safety—Another natural resource. W. Brushwell. *Am. Paint J.* 41(13), 84(1956). *Ibid.* (14) 84(1956). A comprehensive discussion of all phases of safety related to the paint industry.

Improvement of drying oils by conjugation of double bonds. Part I. Methods of conjugation. W. A. Bush(Pacific Vegetable Oil Corp.). *Am. Paint J.* 40(46), 80(1956). **Part II. Advantages of conjugation.** *Ibid.* (50), 80(1956); Ibid. (51), 78(1956); *Ibid* (52), 97(1956); *Ibid.* 41(1), 78(1956). A comprehensive literature survey. 48 references.

The curing mechanism of epoxy resins. W. Fisch, W. Hofmann, and J. Koskikallio(Ciba Ltd., Basle). *J. Applied Chem.* 6, 429(1956). A study has been made of the curing of epoxy resins from 2:2-bis(4-hydroxyphenyl) propane with phthalic anhydride. It is shown that in all cases an equilibrium is set up in which, after complete reaction of the epoxy groups, there are present anhydride, monoester and hydroxyl groups. The effect of temperature on the content of these groups has been determined and shown to be considerable. On heating cured resins, most of the monoester groups are split off and phthalic anhydride is evolved. A minimum point is obtained in the graph relating loss of weight and amount of anhydride used. The reason for this is discussed. The distribution of the various types of group has been determined in cured resins by chemical methods, which affords a good picture of the structure of resins cured under different conditions.

1957 paint sales to increase 5% over last year. D. P. Joyce (Glidden Co.). *Chem. Processing* 20(1), 34(1957).

Oil varnishes from glyceryl esters of phenol-formaldehyde modified rosin. N. R. Kamath and G. D. Shetye(Univ. Bombay). *Paintindia* 6(8), 21(1956). Fifty-four varnishes from six different glyceryl esters of phenol-formaldehyde modified rosin and linseed oil, DCO and 50:50 mixture of the two oils have been prepared and their film properties determined.

Applications of infrared spectroscopy to surface coatings. L. A. O'Neill and C. P. Cole(Paint Res. Sta., Teddington, Eng.). *J. Applied Chem.* 6, 399(1956). A survey is made of the applications of infrared spectroscopy in the surface coatings field, especially in connection with (1) the chemistry of drying oils, particularly with reference to the geometrical isomerization of fatty acids, the autoxidation process and copolymerization of oils with unsaturated compounds; (2) the curing of epoxy resins, and (3) the identification of synthetic resins.

The hardening in the cold of epoxy resins with various amino compounds. G. H. Ott and H. Zumstein(Ciba A. G., Basel). *Farbe u. Lack* 62, 413(1956). (*C. A.* 50, 17473)

Dulling of films of rosin-based resins by wood-oil-like wrinkle formation. F. Pallauf(Abshagen & Co., Hamburg-Wandsbek, Ger.). *Farbe u. Lack* 62, 424(1956). Dulling of films of vehicles rich in rosin(colophony) or tall oil is often observed within 24 hrs. It is shown by magnification that this is a fine-wrinkle formation caused by premature surface drying. Examples are maleic resin, Zn resinate, pentaerythritol-rosin and tall oil esters, and glycerol-rosin and tall oil esters. This fouling could be brought out by placing the films under a bell jar with a burning candle. It could be suppressed by addition of Co drier. (*C. A.* 50, 17474)

On the olefinic nature of anacardic acid from Indian cashew nut shell liquid. V. J. Paul and L. M. Yeddanapalli. *J. Am. Chem. Soc.* 78, 5675(1956). The anacardic acid isolated from the solvent-extracted liquid from Indian cashew nut shells has been separated by low-temperature fractional crystallization into a saturated component and a mono-, di-, and triolefin which have been identified by analysis of their permanganate oxidation products, respectively, as 1-hydroxy-2-carboxy-3-pentadecyl benzene, 1-hydroxy-2-carboxy-3-(8′-pentadecenyl)-benzene, 1-hydroxy-2-carboxy-3-(8′11′-pentadecadienyl)-benzene and 1-hydroxy-2-carboxy-3-(8′,11′,14′-pentadecatrienyl)-benzene.

Paint technology—which way in 1957? A. W. Steudel(Sherwin-Williams Co.). *Chem. Processing* 20(1), 42(1957).

The paint industry views developments in the new year. J. M. Thomas(Jones-Dabney Co.). *Chem. Processing* 20(1), 54 (1957).

The reaction of unsaturated fatty acids with styrene. K. Hamann and O. Mauz(Forschunginstitut für Pigmente und Lacke, Stuttgart). *Fette-Seifen-Anstrichmittel* 58, 528(1956). Detailed investigations show that polystyrene as well as copolymers can be formed. The reaction conditions, especially temperature and way of adding, are significant. The reaction mechanism is discussed.

Molecular enlargement of drying oils under the influence of hemins. H. P. Kaufmann and B. Hambrock(Univ. of Münster/Westf.). *Fette-Seifen-Anstrichmittel* 58, 520(1956). Hemins accelerate the autoxidation of conjugated oils. The effect is in first instance a function of the complex-bound heavy metal. Especially effective are the iron-complexes, followed by cobalt, manganese, and lead. Metal-free heterocyclic systems catalyze autoxidation only under certain conditions of light and temperature(photo-catalysis). Nonconjugated oils, drying in presence of metal naphthenates, were less influenced by hemins than conjugated oils.

Structural changes in heating linseed oil. K. D. Ledwoch and K. H. Wullenweber(Rheinpreussen A.G., Homberg/Ndrh.). *Fette-Seifen-Antrichmittel* 58, 516(1956). The changes in the *cis-trans*-relations, occurring when linseed oil is heated, are studied by infrared measurements and discussed with a view on technological important properties.

Determination of porosity and pore-surface of lacquer films by means of electrolytic permeability. K. Weinmann(R. Bosch Labs., Stuttgart). *Fette-Seifen-Anstrichmittel* 58, 507(1956). The relations between porosity and corrosion protection are discussed. A method for the measurement of porosity is described.

Resinous compositions comprising thermosetting epoxide resins and thermoplastic polyvinyl resins and bentonite-amine reaction products. F. J. Zukas(Westinghouse Electric Corp.). *U. S. 2,773,043.*

Freeze stabilized latex coatings. V. M. Willis(Sherwin-Williams Co.). *U. S. 2,773,849.*

Hydrocarbon drying oil. G. E. Serniuk(Esso Res. Eng. Co.). *U. S. 2,780,664.* This patent covers the process of preparing a drying oil which comprises contacting a mixture of 75 parts by weight of butadiene and 25 parts by weight of isobutylene in the presence of about 18.6 to 25 wt. per cent of a complex of boron fluoride and ethyl ether in the mole ratio of 1.0:1.0 to 1.2:1.0, and in the presence of about 25 to 125 volume per cent of a halo-alkane diluent, at a temperature of about —15°. —15°.

Coating materials by copolymerization of unsaturated fatty acid esters with styrene. N. V. de Bataafsche Petroleum Maatschappij. *Dutch 77,877.* Air-dried viscous products are obtained by introducing styrene in the gaseous phase into drying oils, alkyd resins modified by esterification with unsaturated fatty acids obtained from drying oils, or mixtures of drying oils and oil-modified alkyd resins at 200–300°. Preferably, the styrene is diluted with N. The rate of addition is 30–60 g. styrene per hour, 40–70 g. of linseed oil being used. Care must be taken to prevent liquid styrene formed by condensation from flowing back into the reaction mixture. In about 4 hours, clear transparent products are obtained suitable as coating materials and having viscosities of 300–6000 poises. (*C. A.* 50, 588)

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• Detergents

Retention of volatile esters in toilet soaps. J. Sfiras. *Parfums. cosmet., savons* No. 125, 19–21(1956). Volatile esters in toilet-soap perfumes are saponified to a varying degree by the alkali liberated during hydrolysis of soap containing or exposed to moisture. An equivalent amount of free fatty acid is liberated in the process. Stability of the esters was determined by titrating the free acidity produced after storage of soap chips containing standard amounts of ester and moisture or after treatment of esters with 0.1 *N* alkali. Choice of perfume constituents for use in toilet soaps can be based on their resistance to this saponification. (*C. A.* 51, 1630)

Relation between detergency and action given to a thin flexible foil by solutions of surfactants. J. Vallee and A. Hirschmann (Tech. Inst. Corps Gras, Paris, France). *Rev. franc. corps gras* 3, 676–81(1956). A commercial tensiometer patterned after one designed by Thibaud is described. The resistance to raising a thin flexible Pt foil from a liquid is measured and registered as a curve on a photographic plate. Results are expressed as the height in mm. of a point on the curve and this can be converted to surface tension by dividing by an apparatus constant. The apparatus is demonstrated by readings (35–23 mm.) obtained from various concentrations (0.05–1.2%) of Na dodecyl sulfate. Data are presented also for Na isopropylnaphthalenesulfonate, condensates of polyoxyethylene and palm oil, sulfated hydroxyethylamide derivatives of palm oil acids, Me sulfate of (methylphenyl)trimethylammonium, and combinations of Na dodecyl sulfate with, respectively, polyphosphates and Na_2CO_3. (*C. A.* 51, 1629)

Measure of detergency properties of surfactants by the withdrawal of a thin flexible foil from their water solutions. J. Vallee(Tech. Inst. Corps Gras, Paris, France). *Ibid.*, 764–772 (1956). This article contains a correction of the previous article as well as further research. The author used the same surfactants as previously described and gives data on relationship of temperature of maximum detergency, and concentrations of the detergents used.

The water content of the stratum corneum. III. Effect of previous contact with aqueous solutions of soaps and detergents. I. H. Blank and E. B. Shappiro(Harvard Med. School, Boston, Mass.). *J. Invest. Dermatol.* 25, 391–401(1955). Calluses and intact cornified epithelium show about the same capacity to retain H_2O before and after prolonged soaking. The capacity is reduced by either soap solution or synthetic detergent, and the extent of reduction is not affected by the presence of Na_3PO_4. Water soluble N compounds including aromatic amino acids and peptides can be extracted by H_2O alone, but more readily by the aqueous solution of soaps and detergents. In the different extractions the proportion of aromatic amino acid is approximately constant. The detergents do not appear to alter the cornified epithelium more than does coconut oil soap. (*C. A.* 51, 2094)

Application of hyposulfate in manufacture of toilet soap. G. A. Borodina and E. S. Dmitrieva. *Masloboino-Zhirovaya Prom.* 21(1), 19–20(1956). The problems in connection with the use of approximately 0.08% of $Na_2S_2O_3$ (I) in finished soap (II) to preserve or improve its original color are discussed. II made of rosin 2, coconut oil 12, beef tallow 86%, and containing I grew lighter in color during 3 months' storage, but II made of rosin 5, coconut oil 7, lard and beef tallow 20, and hydrogenated cottonseed oil 68% became grayish in color owing to formation of Ni sulfide. Traces of Ni in hydrogenated fats and S from decomposition of I prohibited the use of I as a color preservative or improver for soaps. (*C. A.* 50, 9041)

The surface plasticity of a homologous series of sodium soap solutions. E. J. Burcik and R. C. Newman(Penn State U., University Park, Penn.). *J. Colloid Sci.* 12, 10–18(1957). The purpose of this study was to measure the transition temperature as a function of concentration for sodium laurate, sodium myristate, sodium palmitate, and sodium stearate. The effect of pH on surface plasticity was more fully investigated and experiments were conducted to ascertain the effect of various additives on surface plasticity. The results show that under the proper conditions of concentration, pH and temperature the hydrolysis products of the sodium soaps of lauric, myristic, palmitic, and stearic acids form plastic surfaces, although the bulk liquid has a viscosity essentially that of pure water. Because the plastic surfaces may be eliminated by raising the pH it is probable that the hydrolysis products are responsible for this behavior.

The cleaning of hard surfaces by alkaline solution. M. Camp and J. P. Parke(Unilever Ltd., Port Sunlight, Engl.). *Ind. Chemist* 33, 83–6(1957). It has been shown that the essential function of alkalies in industrial cleaning is to react with and remove adsorbed layers of fatty acids which cause oily soil to adhere to hard surfaces. In practice, caustic soda completely removes oily soils from glass and brass, but allows the redeposition of these soils as its concentration is reduced, as in a rinsing process. Soil encountered generally forms chemisorbed layers on steel surfaces and the soil is not completely removed by caustic soda solution because this solution does not react with and remove the chemisorbed layer. Sodium metasilicate is superior to caustic soda in such operations since it appears that silicate is adsorbed on the hard surface, presumably physically in the case of glass and probably chemically in the case of metals. The adsorbed silicate layer helps to displace any adsorbed layer of polar fatty material from the hard surface and prevents its subsequent redeposition.

A British view of the sucrose detergents. H. C. S. de Whalley (Tate & Lyle, Ltd., Engl.). *Chem. Products* 20, 105–6(1957). Economic aspects of sucrose detergents are outlined. Since these sucrose detergents are low foaming products, they may provide the solution to the sewage effluent problem now existing with high foaming detergents.

Surface activity, wetting, and dewetting. J. Guastalla(Univ. Paris). *J. Colloid Sci.* 11, 623–36(1956). A review of recent work on the determination of surface activity in aqueous solutions and the Traube rule for homologous series of fatty acids, and of contact angles and the wetting or nonwetting of solids by aqueous solutions of surface-active agents under static and dynamic conditions. 21 references.

Manufacture of toilet soap bars. W. L. Hardy(Foster D. Snell Inc., New York, N. Y.). *Ind. Eng. Chem.* 49(1), 95A–96A (1957). Plant process of preparing toilet soap bars is outlined giving flow sheet and estimated investment cost of plant and estimated processing costs. The cost to produce an average toilet soap bar is about 1 cent a bar.

A soap and detergent pilot plant. R. F. Heald(Colgate-Palmolive Co., Jersey City, N. J.). *Ind. Eng. Chem.* 49, 338–46 (1957). The new Colgate-Palmolive Co.'s pilot plant is described in detail, and problems which occurred in the design and construction of the plant are discussed. Flowsheets are given for five different typical soap and detergent pilot plant units, and photographs show details of special equipment. A general discussion of pilot plant operation points out some problems. There is also a brief review of the correlations which have been established between pilot plant experimental results and factory production.

The washing action of alkylpolyethylene oxides. I. M. Kehren and M. Rosch. *Melliand Textilber.* 37, 1194–7(1956). A review(20 references) and criticism of the older theories of the detergent effect. (*C. A.* 51, 4029)

An extension of the theory of acid number. W. Presting and R. Kaiser(Inst. Org.-Chem. Ind., Leipzig, Ger.). *Chem. Tech.* (Berlin) 8, 386–7(1956). By analogy to the acid number of soaps made from oils, fats, and waxes, an expression for the alkali number is introduced. It is expressed in equivalent mg. of KOH, and it depends on the molecular weight of the fatty acid contained in the soap and on the molecular weight and valence of the particular alkali cation involved. The alkali number is useful in determining percentage of soap in fats or waxes and the molecular weight of soaps. (*C. A.* 51, 1629)

Plotting a ternary diagram for neutral fat-soap-water. A. Prevot(Iterg. Paris). *Rev. franc. corps gras* 3, 852–7(1956). A triangular phase diagram representing the behavior at 90° of the system is traced based on 57 mixtures of the components (with tallow as fat) centrifuged in sealed glass tubes. Zones of separation into the 3 constituents, particularly interesting for the oil refiner, could not be observed. Separation into 2 phases furnishes, besides medium, neat soap, etc., some characteristic compositions, e.g., one containing 63% soap and 37% fat. From single phases one "pasty" with approximately soap 38, fat 24, and water 38% was observed, another not well defined with soap 18–20, fat 9–32, water 55–70% was "rigid." (*C. A.* 51, 4029)

Microkinematic studies on emulsions, dispersions, and saponification processes, with special consideration of the fat of human skin as the basis of the soiling of laundry. H. Reumuth. *Riechstoffe u Aromen* 6, 317–26(1956). Photomicrographic and microcinematographic studies of saponification, autoemulsification, and heteroemulsification of the fat from human skin, are reported and discussed in relation to the laundering process. (*C. A.* 51, 4029)

Identification of anionic synthetic detergents in foams and surface waters. A. A. Rosen, F. M. Middleton and N. W. Taylor (R. A. Taft Eng. Center, USPHS, Cincinnati, Ohio). *J. Am. Water Works Assoc.* 48, 1321–30(1956). Infrared spectroscopy has been applied to the detection of anionic surfactants in water and foams. There is much interference. The work done is described. Four surfactants are studied. In combining C adsorption and infrared spectroscopy, it was felt that some results of value were being obtained. The alkylbenzenesulfonic acid class give the best results. (*C. A.* 51, 2206)

Addition of cottonseed oil soap to cement mortars and concrete. S. B. Salidzhanov(Trudy Inst. Sooruzhenii). *Akad. Nauk Uzbek. S.S.R.* **1954**(5), 53–64; *Referat. Zhur. Khim.* **1955**, No. 10029. Addition of 0.01–0.05% of the soap did not affect the consistency nor the time of setting of the cement mixture. The soap reduced appreciably the separation of the water and the layering connected with it. The soap had a plasticizing effect and permitted the reduction of the water-cement ratio, the amount of cement, and at the same time increased the strength. Addition of this soap improved the bonding of the concrete with its reinforcement. Addition of 0.05% of this soap improved the water impermeability and frost resistance of cement mixes and concrete. The soap also reduced the capillary suction by the concrete and appreciably reduced deformation of concrete under the influence of alternating drying and wetting of the surface. (*C. A.* 51, 1573)

The laundering of textiles made from man-made fibers. O. Viertel. *Textile Mfg.* 82, 589–92(1956). The structure of cotton fibers is such that dirt clings to them. By comparison, smooth fibers like the synthetics give dirt particles no hold, so that light washing is sufficient to get the material clean. However, washing these fabrics just in cold water is not adequate. It was found that clothing in contact with the skin and exposed to heavy soiling is best washed at 60–70° with a commercial detergent. The removal of skin fat demands somewhat higher temperatures and a certain alkaline condition not available when washing in likewarm water with a neutral cleanser.

The soiling characteristics of textile fibers. II. The influence of fiber geometry on soil retention. A. S. Weatherburn and C. H. Bayley(National Research Council, Ottawa, Can.). *Textile Research J.* 27, 199–208(1957). The influence on soil retention of filament denier and cross-sectional contour of a series of man-made fibers has been studied. Soil content was determined by dissolving the soiled fiber in a suitable solvent and measuring the optical density of the resulting suspension. In general, soil retention increases with decreasing filament denier, and for any one type of fiber. Soil retention by any one type of fiber is a linear function of the gross surface area of the filaments. There are differences in soil retention by various chemical types of fiber that apparently cannot be related to differences in physical size and shape of the filaments. The influence of static electricity on soiling is not clear, soil retention showing no correlation with the magnitude of the electrostatic charge. The visual appearance of soiled fibers is not necessarily indicative of the quantity of soil retained.

The influence of alkalies on soil removal in soap solutions. A. Van Nuffel. *Industrie Chimique Belge* 22, 27–38(1957). The influence of 9 different alkalies on soil removal and soil redeposition in solutions of soap and an alkylarylsulfonate has been studied. Soil removal was measured by means of a washing test using the Launderometer and the soiled cloth of the U. S. Testing Co. The alkalies were classified according to their influence on the soil removal by the soap or the alkylarylsulfonate. Different concentrations of alkalies were investigated in distilled and hard water (22°F.). It was established that soil removal depends firstly on pH and secondly on the ionic concentrations. Studied also were the influence of high polymers such as carboxymethylcellulose and polyvinylalcohol on soil removal and redeposition. The high value of these products was also clearly demonstrated.

All-purpose detergent bar. C. F. Jelinek, R. L. Mayhew and J. A. Yeager(General Aniline & Film Corp.). *U. S. 2,781,320.* A synthetic detergent bar useful in all types of washing conditions comprises about 5 to 50% by weight of a water-soluble alkyl sulfonate salt containing at least an 8-carbon alkyl side chain, such as sodium dodecylbenzene sulfonate as a detergent; about 5 to 25% of a water-soluble alkyl naphthalene sulfonate salt such as sodium diisopropyl naphthalene sulfonate; and about 5 to 25% of water-soluble salt of a lower alkyl ester of sulfosuccinic acid such as sodium diamyl sulfosuccinate, both added as lathering agents.

Method and apparatus for cooling soap and the like. A. L. Schulerud(Colgate-Palmolive Co.). *U. S. 2,776,544.* Soap cakes of high moisture content still warm and soft from a preceding plodding operation are cooled by passing the cakes on a continuously-moving mesh belt through a cooling zone where they are contacted with brine cooled to a temperature not over 60°F. and then through a drying zone where they are contacted with a blast of air sufficient to remove drops of brine adhering to the surface of the soap cakes.

Detergent sulfonic acid and sulfate salts of certain amphoteric detergents. H. S. Mannheimer. *U. S. 2,781,380.* Amino acid metal salts are reacted with one or a combination of two or more anionic surface-active agents to provide novel, water-soluble compounds having high wetting, detergency, and surface-active properties and capable of providing voluminous and stable foams in aqueous solutions which are nonirritating to the skin.