7. The Fat Analysis Committee

The Fat Analysis Committee has recommended that the following tentative methods be made official:

Commercial Fats and Oils

Ca 11–46	Ash in Fatty Oils
Ca 12–53	Phosphorus
Cc 8d–48	Refined and Bleached Color of Tallows and Greases

Lecithin

Ja 3–46	Benzene Insoluble Matter
Ja 5–53	Total Phosphorus
Ja 6–51	Acid Value

Drying Oils

Ka 2–47	Acid Value
Ka 4–47	Refractive Index
Ka 5–47	Specific Gravity
Ka 6–48	Viscosity
Ka 7–48	Flash and Fire Points (Open Cup)
Ka 10–51	Ash
Ka 11–51	Acetone Tolerance

These changes from tentative to official status were approved by the Uniform Methods Committee. *Approved.*

Seed and Meal Analysis Committee, T. H. Hopper, chairman

1. Residual Lint on Cottonseed Subcommittee, R. T. Doughtie, chairman

An improved method for the determination of residual lint on cottonseed was recommended as tentative, with retention of the present official method Aa 7–44. The proposed method is supported by a mass of cooperative analytical data which show its advantages over the present method. In order to avoid confusion and duplication of methods the Uniform Methods Committee has approved the proposed Tentative Method Aa 7–55 to supersede and replace present Official Method Aa 7–44. Specifications for the Infra-Red Oven will be made available to the editor of the Methods. *Approved.*

2. Gossypol Analysis Subcommittee, C. L. Hoffpauir, chairman

a) A new method for Total Gossypol, Ba 8–55, is recommended for adoption as Tentative. It is applicable to cottonseed, cooked meats, slab press cake, and meals, not chemically treated so as to contain dianilino-gossypol. It has been completely validated by cooperative work. *Approved.*

b) The Official Method for Free Gossypol in cottonseed, meats, cake, and meal has been revised to make it applicable to those meals which have been chemically treated and contain dianilino-gossypol. The proposed revision, to be known as Tentative Method Ba 7–55, is to replace and supersede Official Method Ba 7–50. It includes a qualitative test for differentiating normal and treated meals and separate procedures for their analysis. These methods have been tested thoroughly. *Approved.*

Soap Analysis Committee, E. W. Blank, chairman

1. A new method, for determination of chlorides in soaps and synthetic detergents and their products, by potentiometric titration is recommended for adoption as Tentative. The proposed method will be known as Tentative Method Db 7b–55 and uses commercially available apparatus. Its adoption as a Tentative Method was *approved.*
2. Changes should be made in the scope of the following methods for "Total Alkalinity of Alcohol Insoluble Matter:"

Da 7-48

Scope should be revised to read:

"Applicable to soda soaps and soda soap products."

Db 5-48

Scope should be revised to read:

"Applicable to all soda soaps and soda soap products containing synthetic detergents."

These changes were *approved.*

All actions approved by the Uniform Methods Committee were adopted by the Society in its business session on April 20, 1955. The length of this report is ample testimony to the industry of our technical committees. There is reason to believe that the Fall Meeting will bring further evidence of their activity.

The Uniform Methods Committee wishes to thank the technical committee chairmen and members, and through them their employer organizations, for the support of the investigations which have made necessary these changes and additions to A.O.C.S. Methods.

M. M. DURKEE
J. J. GANUCHEAU
D. L. HENRY
T. H. HOPPER
R. J. HOULE
R. R. KING
J. T. R. ANDREWS, chairman

ABSTRACTS . . . . R. A. Reiners, Editor

• Oils and Fats

Ralph W. Planck, Abstractor
Dorothy M. Rathmann, Abstractor
Sin'itiro Kawamura, Abstractor

A constituent of the unsaponifiable portion of animal tissue lipids (λ max. 272 mμ). G. N. Festenstein, F. W. Heaton, J. S. Lowe and R. A. Morton (Dept. Biochemistry, Univ. of Liverpool, England). *Biochem. J.* 59, 558-566 (1955). A substance (SA) with an absorption peak at 272 mμ (in cyclohexane), an inflexion near 330 mμ and a plateau near 410 mμ ($E^{1\%}_{1\,cm.}$ 180, 13 and 8 approx. respectively) has been obtained by chromatography on alumina of various animal tissue unsaponifiable fractions. SA is not very strongly adsorbed on alumina, it contains two oxygen atoms (no hydroxyl) and a possible formula is $C_{28}H_{42}O_2$ (molecular weight observed 430); it is alkali-labile, particularly so in the purer state. From the polarity, infrared and ultraviolet absorption and probable empirical formula, SA could be a steroid with a chromophoric grouping 8(9)-ene-7:11-dione.

Infrared evaluation of sodium salts of organic acids. E. Childers and G. W. Struthers (Polychemicals Dept., E. I. du Pont de Nemours & Co., Charleston, W. Va.). *Anal. Chem.* 27, 737-741 (1955). Infrared spectra of the sodium salts of the monobasic acids (acetic through caproic) and the dibasic acids (oxalic through pimelic) have been recorded over the 2- to 15-micron range. The spectral absorption bands of the sodium salts show a marked degree of specificity in contrast to the acids themselves, and can be used for both qualitative and quantitative evaluation of acid mixtures. A typical analysis—the determination of adipic acid in an adipic-glutaric acid mixture—is described in detail. A precision of 4% relative was obtained for the method at an adipic level of about 10%.

New solvent system for separating monocarboxylic acids (C_2 to C_{16}) and Dicarboxylic acids (C_2 to C_{22}). V. Zbinovsky (Wisconsin Alumni Research Foundation, Madison, Wis.). *Anal. Chem.* **27**, 764-768 (1955). Silicic acid columns capable of quantitatively separating all the saturated fatty acids from C_2 to C_{14} have been developed. These columns also separated fatty acids differing by two carbon atoms in the range C_{12} to C_{16} and all the dicarboxylic acids from C_2 to C_{22}. The solvents are methyl Cellosolve-water as internal phase, and Skellysolve B, *n*-butyl ether, or mixtures of these as external phase. The method is relatively rapid and should be useful in the chemistry of natural products and pharmaceuticals, in the oxidative determination of the structure of unsaturated acids, and in biological problems in the field of fat metabolism.

Infrared spectra of alkyl hydroperoxides. H. R. Williams and H. S. Mosher (Dept of Chem., Stanford Univ., Stanford, Calif.). *Anal. Chem.* **27**, 517-521 (1955). The infrared spectra of 17 alkyl hydroperoxides, both primary and secondary, have been recorded between 2 and 15 microns. In each case the hydroperoxide showed a characteristic but rather weak absorption in the region 11.4 to 11.8 microns, which has been previously correlated with the oxygen-oxygen stretching vibration. This was a region in which some of the corresponding alcohols also absorb and thus it was not a unique means of characterizing the hydroperoxide. All primary and secondary alkyl hydroperoxides showed absorption in the 12.0- to 12.5-micron region. A most interesting alternating pattern was shown by normal alkyl hydroperoxides in this region; those which had an even number of carbon atoms (butyl through decyl) showed two maxima (at about 12.1 and 12.4 microns) while the odd-numbered members of the series showed a single maximum at about 12.3 microns.

A study of the volatile fraction isolated from oxidized milk fat. II. Further characterization of compounds responsible for the oxidized flavor. A. F. Tamsma (Dairy Ind. Sect., Iowa State College, Ames). *J. Dairy Sci.* **38**, 487-98 (1955). Three classes of carbonyl compounds were found in the volatile Skellysolve soluble fraction from milk fat oxidized at 100°. They were: (a) unconjugated unsaturated, (b) conjugated monene, and (c) conjugated diene carbonyl compounds. The first two classes constituted the major portion of the volatile fraction; the third was present only in minor quantities. The first class of carbonyl compounds appeared to be responsible for oxidized flavor; carbonyl group and unsaturation both were essential in this respect.

General density equation for glyceridic oil-solvent mixtures. Calculation of density-composition-temperature data from oil and solvent densities. E. L. Skau, F. C. Magne, R. R. Mod, and R. L. Durr (So. Reg. Res. Lab., New Orleans, La.). *Ind. Eng. Chem.* **47**, 1043-49 (1955). Complete experimental density data over a range of temperatures were presented for the following oil-solvent systems: commercial hexane with linseed, safflower, sesame, tung, neats-foot, sperm, cod liver, and menhaden oils; cottonseed oil with benzene and with dichloroethylene; and castor oil with butanone. The results with castor oil showed that the equation was also valid for glycerides of long-chain hydroxy fatty acids, but that a different value for *K* must be used.

Empirical viscosity relations of heated vegetable oils. R. P. A. Sims (Div. of Chem., Science Service, Dept. of Agr., Ottawa, Canada). *Ind. Eng. Chem.* **47**, 1049-52 (1955). The parallel curves for kinematic and dynamic viscosity showed that kinematic vicosity could be as useful an index as dynamic viscosity in the investigation of the polymerization of vegetable oils.

Vegetable oil extraction. Autoxidation products of trichloroethylene. L. L. McKinney, E. H. Uhing, J. L. White (Northern Utilization Research Branch, U.S.D.A., Peoria, Ill.) and J. C. Picken, Jr. *J. Agr. and Food Chem.* **3**, 413-19 (1955). Trichloroethylene-extracted soybean oil meal has been associated with a refractory, hemorrhagic, aplastic anemia when fed to cattle. Quantitative data on the autoxidation of trichloroethylene were needed to determine whether the oxidation products contributed to the toxicity. The autoxidation with oxygen at 45° to 70° yielded about 95% of a liquid mixture and about 5% of gaseous products. The liquid was composed of about equal parts of dichloroacetyl chloride and a very reactive isomer believed to be trichloroacetyl chloride, glyoxylic and formic acids, and carbon monoxide. With this knowledge of the autoxidation products of trichloroethylene, it was possible to make them react, under controlled conditions, with soybeans and with soybean oil flakes for toxicity studies.

Vegetable oil extraction. Toxicity of trichloroethylene-extracted soybean oil meal. J. C. Picken, Jr., N. L. Jacobson, R. S. Allen, H. E. Biester, P. C. Bennett (Iowa State College, Ames) and L. L. McKinney and J. C. Cowan (Northern Utilization Research Branch, U.S.D.A., Peoria, Ill.). *J. Agr. and Food Chem.* **3**, 420-24 (1955). Trichloroethylene-extracted soybean oil meal has been the cause of several major outbreaks of a fatal hemorrhagic toxicity disease of cattle during the past 40 years. Trichloroethylene or its breakdown products may react directly with some component of the soybean during processing to form the toxic meal. Evidence supporting the possible autoxidative decomposition of trichloroethylene during the processing of soybeans has been presented. In order to evaluate this hypothesis, soybeans, defatted soybeans, soybean protein, and casein were treated with the products resulting from the autoxidation of trichloroethylene in the attempt to produce typically toxic preparations. None of these products, assayed in the young calf, appeared capable of producing the typical toxicity disease, though isolated manifestations of the disease syndrome developed. In further studies, the normal operation of a commercial trichloroethylene-soybean extraction plant was altered in the attempt to produce conditions both favorable and unfavorable to possible autoxidative decomposition of trichloroethylene. Assay indicated that the meal toxicity was neither enhanced nor decreased by the modifications.

Chromatographic separation of polybromo fatty esters. D. R. Howton (Atomic Energy Project, School of Med., Univ. of Calif., Los Angeles). *Science* **121**, 704-708 (1955). It has now been demonstrated that the addition of bromine to unsaturated fatty acid esters enhances the adsorption-affinity contribution of each unsaturation site to such an extent that the resulting esters, differing in the number of pairs of vicinal bromine substituents that they contain, were easily and cleanly separated by gradient elution from alumina chromatographic columns.

Preparation and properties of β-lactyl-α,γ-dipalmitin. L. A. Goldblatt, D. A. Yeadon and Mona Brown (So. Reg. Res. Lab., New Orleans, La.). *J. Am. Chem. Soc.* **77**, 2477-79 (1955). β-Lactyl-α,γ-dipalmitin was prepared by the reaction of α,γ-dipalmitin with the benzyl ether of lactyl chloride and hydrogenolysis of the benzyl group. Ultraviolet spectra to 220 mμ and infrared spectra from 2 to 12 μ of benzyllactic acid, the benzyl ether of lactyldipalmitin and lactyldipalmitin were obtained.

History and latest development in expeller and screw press operations on cottonseed. J. W. Dunning (V. D. Anderson Co., Cleveland, O.). *Oil & Soap* (Egypt) 2(1), 31-25 (1955). A review well illustrated with 16 photographs and diagrams is given. The importance of maintaining proper cooking conditions is emphasized.

Cottonseed and its products. M. N. Krishnamurti (Vanaspati Research Advisory Com., Central Food Res. Inst., Mysore). *Council of Sci. & Ind. Research,* New Delhi, 63 pp. (1954). This publication is a review of progress made in the utilization of cottonseed during the past 50 years. Topics covered include: the role of cottonseed in Indian economy; composition, storage and processing of cottonseed; nutritional aspects of cottonseed products; refining of cottonseed oil; and the testing of cottonseed and its products. Fifteen standard methods of the American Oil Chemists' Society are described along with lists of the apparatus and reagents needed. Lists are given of foreign manufacturers and suppliers of cottonseed processing equipment. The cottonseed oil mills in the Indian Union are named. Numerous references.

Some of the developments in oil and fats industry in U. S. A. Abu El Nasr (Alexandria Univ.). *Oil & Soap* (Egypt) 2(1), 6-9 (1955). A brief discussion of recent developments in solvent extraction, continuous hydrolysis, fatty acid derivatives, and other processes.

The effect of ascorbic acid and its derivatives on the autoxidation of lipides. I. Vegetable oils. II. Butter. A. Hérisset. *Trav. lab. matiere méd. et pharmacol. école plein exercice méd. et pharm. Angers* No. 1, 4 pp., No. 2, 4 pp. (1954). The antioxidant effect of ascorbyl palmitate was compared with that of carotene in olive and peanut oils. Ascorbyl palmitate seems less active than carotene initially, but its antioxidant effect appeared to increase in effectiveness with time of storage. Carotene was less effective in butter than it was in vegetable oils, whereas ascorbyl palmitate and ascorbic acid were very effective for butter. With the vegetable oils the testing comprised exposure of samples to light and periodically determining Kreiss color reaction and peroxide value. The tests with butter include aging with and without light and observing decolorization besides the above characteristics. (*C. A.* **49**, 6624-5)

Fixed oil from Hydnocarpus wightianus. I. N. D. Nair and N. S. Varier(Univ. Travancore). *Indian Soap J.* **19**, 225-7 (1954). The air-dried seeds from the fresh fruit were extracted with petroleum ether, the extract dried with anhydrous $MgSO_4$, and the solvent removed by distillation, giving a clear and faintly yellowish oil in 38.5% yield. It had: d_{25} 0.9518, n^{25} 1.4763, [α] (in $CHCl_3$) + 54.6, acid no. 8.5, sapon. no. 201, I no. 97, acetyl value 69.4, Reichert-Meissl no. 0.939, and unsaponifiable matter 0.34%. The mixed fatty acids were obtained as a faintly yellow solid; m. 42°, equiv. wt. 348, I no. 103, and [α] (in $CHCl_3$) + 59.6. The mixed acids contained palmitic and the lower homologues of hydnocarpic 9.6, hydnocarpic 46.4, chaulmoogric 21.5, oleic 12.4, and gorlic acids 10%. 15 references. (*C. A.* **49**, 6626)

Chemical-bromatological study of the oil of Sapindus saponaria. Yolanda Fernandez F. *Congr. farm. bioquim. peruano y convencion farm. norte, Actas y Trabojos* **1953**, 398-401. The oil, extracted (35% yield) from the germ of *S. saponaria* with Et_2O-$CHCl_3$, had: d 0.922, n^{20} 1.46615, Maumené no. 46, I no. (Hübl) 70-3, sapon. no. 240-5, acid no. 0.56, unsaponifiable matter 1.6-2%; total fatty acid 85-90, solid fatty acids 23-4, liquid fatty acids 70-6, stearic 4-6, oleic 40-6, and palmitic acid 12-14%. The Hauchercorne test gave orange, Heydenreich test orange-brown, Bellier test violet, elaidin test yellowish mass, and Halphen and Bechi tests negative. The oil is edible. (*C. A.* **49**, 6626)

Gossypol content of Indian cottonseed and cottonseed oil. M. Narayano Rao and K. Krishna Murthy. *Bull. Central Food Technol. Research Inst., Mysore* **3**, 311(1954). Gossypol contents, as determined according to Pons *et al.* (*C. A.* **45**, 3617), in the whole seed, kernel, and crude oil of cottonseeds grown in various locations in India were, resp.: 0.72-0.92, 1.64-2.35, and 0.38-0.46%. The refined oil contained no gossypol. Extraction was by steaming the kernels for 0.5 hr. and hydraulic pressing. (*C. A.* **49**, 6625)

Literature review on oils and fats. 1951. Vanaspati Research Advisory Com. *Council of Sci. and Ind. Research* (New Delhi, India) 44 pp.(1954). This is a popular survey dealing with various aspects of oil and fat technology. Part I, Edible Oils and Fats, covers statistics (production, trade, consumption), India's position, crop cultivation, storage of oilseeds, preservation of oils and fats, analysis and detection of adulteration, nutrition and metabolism, processing methods and patents. Part II, Hydrogenated Products, reviews production trends, storage and preservation methods, nutritive value, processing methods and patents. Appended tables give productions for various years of Indian edible oils and oilseeds, a census of the Indian vegetable oil industry, and various statistics for coconut and copra production. Properties are tabulated for new strains of sesame, peanut, rape and mustard. Agmark standards (official) are tabulated for mustard, coconut, and sesame oils, ghee, and vanaspati.

Sitaphal seed. *Annual Rept. Central Labs. for Sci. and Ind. Research*(Hyderabad, India) **1952**, 1-2, 25. Sitaphal seed (custard apple, sharifa, *Annona squamosa*, Linn.), which grows plentifully in India, has been extracted and the oil and meal studied. A toxic function isolated from the oil had: mol. wt. 322, I value 85, n^{40} 1.4717. The principle acid constituent of the fraction was oleic acid. Alakli refining destroys the insecticidal character of the oil. Soaps made with sitaphal oil form good lathers. Although the extracted meal is toxic and can be used only as fertilizer, other uses for the proteins are being investigated.

Oilseeds acreage of the world. *Oils & Oilseeds J.* **7**(6), 20 (1954). The world acreage of oilseeds was estimated at 80.8 million hectares for 1952. Plantings for various regions (in millions of hectares) and the sq. meters per capita in those regions were: Europe, 150, 70; No. America 233, 1092; Latin America 90, 444; Near East 70, 223; Far East 304, 346; Africa 219, 406; Oceania 21, ...

Standardization of methods in the dairy field. I and II. I. G. Schwarz, A. Lembke, *et al. Z. Lebensm.-Untersuch. u. Forsch.* **98**, 358-63(1954). The sampling and analysis of dairy products is discussed with special attention given to sources of error in the Rose-Gottlieb and the Gerber methods for fat in whole milk and the Schmid-Bondzynski method for fat in cheese products.

Kinetics of saponification. Adel Zien El Din. *Oil and Soap* (Egypt) **2**(2), 41-2(1955). A review of the saponification reaction covering physical and chemical changes, temperature and its effect on reaction velocity, and differences between cold and hot processes.

Purification of oils and fats. M. El Sharkawy(Oils & Soap Works). *Oil & Soap*(Egypt) **2**(2), 46-47(1955). A review of the basic aspects of refining of crude fats and oils with a discussion of the advantages and disadvantages of various methods.

Fatty alcohols, their derivatives and industrial uses. Moh. Abdel Gelil(National Starch Co., Alexandria). *Oil & Soap* (Egypt) **2**(1), 13-15(1955). A review of industrial methods of production of fatty alcohols is given. Uses in synthetic detergents, plasticizers, lubricating oils, greases, cosmetics, rubber, pharmaceuticals, waxes, etc., are given and the physical constants of fatty alcohols tabulated.

Wax from by-products of molasses. M. Abdel Akher(Cairo Univ.). *Oil & Soap*(Egypt) **2**(1), 10-11(1955). Results of an extensive study of the possibility of producing waxes from by-products of Egyptian molasses are reported. The Egyptian product contained 25% wax (dry basis) compared with 8-10% wax in comparable foreign products. Extraction was done with gasoline or *n*-hexane. A production procedure is outlined. A production of 1300 tons of wax per year is possible.

Preparation and properties of perlauric acid. F. P. Greenspan, R. J. Gall, and D. G. MacKellar(Buffalo Electro Chemical Co., Buffalo, N. Y.). *J. Org. Chem.* **20**, 215-6(1955). H_2O_2 (56.6 g. of 90%) was added over a 15-min. period to 300 g. of lauric acid containing 0.18 g. of an alkylaryl sulfonate (Nacconol NR) and 3.0 g. *p*-toluenesulfonic acid monohydrate. After 2-hrs. reaction the product was poured into cold water, the crude perlauric acid filtered off and recrystallized 4 times from petroleum ether. The white, waxy crystalline product assayed 95.8% perlauric acid. It was moderately stable at 25°, reacted with methyl oleate to form methyl epoxystearate, and dissolved in alkali to form a germicidal soap.

Oils, fats and waxes of ancient Egyptians. *Oil & Soap*(Egypt) **2**(2), 61-2(1955)(in English). Material, reprinted from "Ancient Egyptian Materials and Industries" by A. Lucas, shows that numerous oils, fats, waxes, and ointments were known and used by the ancient Egyptians. Samples from tombs have been identified from their contents of stearic and palmitic acids.

Castor oil. *Annual Report. Central Labs. for Sci. and Ind. Research*(Hyderabad, India) **1952**, 2-3. Light- colored dehydrated castor oil was produced by bleaching castor oil first with German fuller's earth (Tonsil), dehydrating by heating under vacuum with Na_2SO_3-Na_2SO_4 catalyst, adding ZnO or $Ca(OH)_2$, and cooling (under vacuum). Subsequent bodying (16 hrs., 240-260°, 4-6 mm. Hg.) gave a bodied oil of 17-25 poises, good color, low acid value, and good drying characteristics. Triricinolein was isolated by liquid-liquid extraction using petroleum ether. Halogenation studies showed that Br_2 and Cl_2 add instantly to ricinoleic acid. With Br_2 little substitution occurs; with Cl_2 the substitution is approximately equal to the addition.

The Bellier test and Bellier number. J. G. Kane(Univ. Bombay). *Oils & Oilseeds J.* **7**(9), 8-10(1955). A review of work on the examination of oils using the Bellier test. The test has been used chiefly for the detection of peanut oil in olive oil but it is useful for testing other oils such as sesame, nigerseed, and safflower for adulteration with peanut oil.

Oils, fat, Vanaspati survey of Pakistan. *Oils & Oilseeds J.* **7**(9), 5-6(1955). A survey of the sources, production, and shortages of oils and fats in Pakistan. Potential yield of cottonseed oil is about 60,000 tons but has seldom exceeded 35,000 tons.

Possibilities of oil resources from oil mills in India. Y. K. Raghunath Rao(General Food Tech. Res. Inst., Mysore). *Oils & Oilseeds J.* **7**(9), 14-15(1955). There are abundant sources of rice bran and germ available as byproducts of the Indian rice milling industry and from which 500,000 tons of oil might be recovered. Fresh bran may be kept from deteriorating by heating at 100° for 30 min. to inactivate the lipase. Fresh bran (10% oil, 3% fatty acids) was heat treated, and stored for 10 days. The free fatty acid content rose to only 3.8% while in an unheated control the free fatty acids rose to 18% in the same period. Hot alcohol is a better solvent than hexane for the extraction of the oil in that a better grade of oil is produced, refining losses are reduced, and more byproducts are recovered. The alcohol is de-acidified and reused.

Histochemical study of lipide peroxides produced in skin by X-rays. P. Dubouloz and J. Dumas(Univ. Marseille, France). *Compt. rend. soc. biol.* 148, 705(1954). Very severe x-radiation (20,000 r.) caused immediate formation of small amounts of lipide peroxides in the skin of the live rat. (*C. A.* 49, 1955)

Emulsification of edible oils and facilitate the preparation of sauces. Amadeo Rife Daví. *Spanish* 205,675, June 26, 1953. Emulsified sauces, such as mayonnaise, are easily prepared in the home by adding to the oil about 1% of an edible emulsion consisting of the partial ester of a polyhydric alcohol having 15-30 C atoms and a fatty acid having 10-18 C atoms. (*C. A.* 49, 6504)

Feed supplement for livestock and other animal feeds. E. L. St. John. *U. S. 2,708,163.* A feed supplement having a fat content of less than 50% and containing a negligible amount of free fatty acids is prepared by heating animal fat with water and sodium silicate, adding copperas to the hot solution to neutralize partially the acids and then completing neutralization with sodium bicarbonate.

Stabilized vitamin A composition. J. C. Bauernfeind and L. Magid(Hoffmann-La Roche, Inc.). *U. S. 2,708,628.* Synthetic fatty acid esters of vitamin A are stabilized by intimate mixing with N,N′-diphenyl-*p*-phenylenediamine.

Lecithin composition. E. R. Neiman(Sadie Neiman). *U. S. 2,708,631.* A dry, finely divided, free flowing lecithin product is obtained by slowly adding lecithin to anhydrous dextrose. Agitation of the mixture is continued until all of the lecithin has been absorbed. The product contains about 20% lecithin by weight.

Process for preparing stabilized peanut butter. W. M. Cochran and J. Carter(The Glidden Co.). *U. S. 2,708,634.* Blanched peanuts are roasted in the presence of a hydrogenated peanut oil having an iodine value between 40 and 60. Peanut butter prepared from these peanuts is stabilized against oil separation during standing.

• Biology and Nutrition

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

Effects of adrenal corticoids on fatty acid synthesis in mammary gland slices in vitro. Mary L. McNaught, R. F. Glascock, Judith H. Balmain, and S. J. Folley(National Inst. of Res. in Dairying, Univ. of Reading, England). *Biochem, J.* 60, 102-108(1955). The effect of cortisone, cortisol, corticosterone and deoxycorticosterone, alone and in conjunction with insulin, on the incorporation of glucose and acetate labelled with C^{14} or H^{3} into the fatty acids of lactating mammary gland slices from rats and sheep has been studied. In general it was found that cortisol had very little effect, that cortisone had some effect and that corticosterone had considerable effect with deoxycorticosterone behaving somewhat like corticosterone.

Biosynthesis of fatty acids in cell-free preparations. 2. **Synthesis of fatty acids from acetate by a soluble enzyme system prepared from rat mammary gland.** G. Popjak and Alisa Tietz (Natl. Inst. for Med. Res., Mill Hill, London, N.W. 7). *Biochem. J.* 60, 147-155(1955). A soluble enzyme system, synthesizing short- and long-chain fatty acids from acetate, has been prepared by high-speed certrifugal fractionation of homogenates of mammary gland of lactating rats. Neither the 'mitochondrial' nor 'microsomal' fractions of the mammary-gland homogenates were required for fatty acid synthesis. The ability of the soluble supernatant to synthesize fatty acids was usually greater than that of the full homogenate. In the soluble enzyme preparations ATP alone was sufficient to activate synthesis from acetate and the requirement for ATP was assolute. ADP could effectively replace ATP.

Biosynthesis of fatty acids in cell-free preparations. 3. **Coenzyme A dependent reactions in a soluble enzyme system of mammary gland.** *Ibid.*, 155-165(1955). A soluble enzyme system (MGE), prepared from the mammary gland of lactating rats, which synthesizes fatty acids from acetate on addition of ATP, was shown to contain about 50 µg. of CoA/ml. The activation of acetate and of other *n*-fatty acids with CoA in the MGE was inferred from the formation of hydroxamic acids, some of which were identified by paper chromatography. The activation of acetate predominated. ADP could replace ATP in the activation reaction. The MGE contained 'endogenous' substrates from which acetyl-CoA and higher acyl-CoA compounds were formed under appropriate conditions.

Studies on encephalomalacia in the chick. II. The protective action of diphenyl-p-phenylenediamine against encephalomalacia. E. P. Singsen, R. H. Bunnell, L. D. Matterson, Anna Kozeff, and E. L. Jungherr(Dept. of Poultry Sci. and Dept. of Animal Diseases, Storrs Agricultural Experiment Station, University of Conn., Storrs). *Poultry Sci.* 34, 262-71(1955). On the basis of the data presented, it was proposed that the primary function of vitamin E in preventing encephalomalacia was that of a general biological antioxidant. It was also proposed that DPPD and other substances exerting a protective action against chick encephalomalacia function because they parallel the biological antioxidant properties of vitamin E.

Effects of different grades of animal fats on the performance of chicks. A. J. Siedler, H. E. Scheid and B. S. Schweigert (Div. of Biochem. and Nutrition, American Meat Inst. Found. and Dept. of Biochem., Univ. of Chicago, Chicago, Ill.). *Poultry Sci.* 34, 411-14(1955). The effects of the addition of 3 or 6% stabilized feed grade animal fats or 3% stabilized free fatty acids to a high energy broiler ration were investigated. The rates of gain of all groups tested showed no significant differences in either experiment.

X-ray diffraction powder data for steroids. J. Parsons and W. T. Beher(Edsel B. Ford Inst. for Med. Res., Henry Ford Hospital, Detroit 2, Mich.). *Anal. Chem.* 27, 514-17(1955). X-ray diffraction powder data and powder diffraction photographs for 27 steroids were presented. Visual comparison of the powder patterns for known and unknown steroids was found to be sufficient for identification.

Milk lipase. I. The lipolytic activity of separator slime. H. G. Nelson and J. J. Jezeski(Dept. of Dairy Husbandry, Univ. of Minnesota, St. Paul). *J. Dairy Sci.* 38, 479-85(1955). Separator slime was a source of much more concentrated lipase than was either skimmilk or cream. The process of separation seemed to play some role in determining the amount of lipase in separator slime and skimmilk since there was considerable variation in the amount of lipase activity found in separator slime and skimmilk. The causes of these variations were not determined. At least some of the lipase of separator slime could be transferred to an aqueous solution by means of homogenization and centrifugation. Condensation under high vacuum will concentrate lipase activity in direct proportion to the reduction in volume of the aqueous solution. By means of lyophilization it was possible to obtain the separator slime in a dry powder form. This powder was soluble in water, possessed high lipase activity, and retained its lipolytic properties over a considerable length of time when stored at 0°. Blood serum and leucocytes do not seem to play a part in contributing to the high lipase activity of separator slime.

Utilization of a "synthetic" triglyceride preparation by weanling rats. H. C. Meng and J. B. Youmans(Depts. of Physiology and Med., Vanderbilt Univ. School of Med., Nashville, Tenn.). *J. Nutrition* 55, 527-39(1955). The nutritional value of a synthetic triglyceride preparation composed of oleic acid, 60.0; palmitic acid, 30.0; stearic acid, 7.4; and linoleic acid, 2.6% was studied using weanling male rats of the Sprague-Dawley strain as experimental subjects. It was found that the synthetic triglyceride preparation incorporated in the diet at 5 and 25% levels was biologically utilized in the body, using weight gain, food intake and nitrogen and water balances as criteria.

Food. J. R. Matchett and H. W. von Loesecke(Washington Util. Res. Branch, Agr. Res. Service, U.S.D.A., Washington, D. C.). *Anal. Chem.* 27, 623-32(1955). This review covers the two years that have passed since the previous one was completed.

Fat studies in poultry. 4. The effect of Triton Wr-1339 on tissue lipid levels in cockerels. B. March and J. Biely(Poultry Nutrition Lab., Univ. of B. C., Vancouver 8, B. C., Canada). *Poultry Sci.* 34, 293-95(1955). Triton WR-1339 was injected subcutaneously into six-week-old cockerels. The effects on the amount of fat present in the blood, muscle, liver and abdominal fat depots were as follows: (1) A single injection produced temporary lipemia, repeated injections maintained an elevated blood level. (2) Liver fat was increased. (3) Tibial muscle fat was decreased. (4) Abdominal depot fat was decreased.

Alfalfa carotenoids. Effect of added animal fats and antioxidant on stability of xanthophyll concentrates in mixed feeds. A. L. Livingston, E. M. Bickoff, and C. R. Thompson (Western Utilization Research Branch, Agricultural Research Service, U.S.D.A., Albany 10, Calif.). *J. Agr. and Food Chem.* 3, 439-41 (1955). The stability of carotenoids in four commercial concentrates was evaluated. The carotenoids in two of the four concentrates studies were very unstable. During commercial preparation, one of the less stable concentrates had undergone a saponification treatment which probably removed natural antioxidants. Generally, addition of the concentrates to mixed feeds gave better carotenoid stability than when the materials were stored as such in open vials. The pigments of a lettuce meal concentrate were slightly less stable in a mixed feed when stored alone. It was demonstrated that the addition of animal fats or an antioxidant, 6-ethoxy-1,2-dihydro-2,2,4-trimethylquinoline, improved the retention of carotenoids in mixed feeds. Use of the two together was more effective than either one used separately. Complete stabilization of the xanthophyll concentrates was achieved by storage in filled, sealed containers.

The stability of carotene and vitamin E in dehydrated forage crops. G. O. Kohler, Elizaberth Beier and C. C. Bolze (Cerophyl Labs. Inc., and National Dehydration and Milling Co., Kansas City, Mo.). *Poultry Sci.* 34, 468-71 (1955). The effect of temperature and exclusion of oxygen on vitamin E and carotene stability in dehydrated grass meal has been studied. The rates of loss of both carotene and vitamin E followed the pattern of first order reactions. Vitamin E in dehydrated grass meal was considerably more stable than was carotene. The rate of loss of vitamin E was less affected by temperature changes than was the rate of loss of carotene.

Antagonism of fresh fat to the toxicity of heated and aerated cottonseed oil. H. Kaunitz, C. A. Slanetz and Ruth E. Johnson (Dept. of Pathology and the Inst. of Res. in Animal Diseases, Columbia Univ., New York, N. Y.). *J. Nutrition* 55, 577-87 (1955). The inclusion in a rat diet of 15 to 20% of refined cottonseed oil, aerated and heated to 95° for 200 to 300 hours, led to rapid loss of weight and death within three weeks. Addition of fresh oil to the diet containing the heated and aerated oil protected the animals against the toxicity. Only growth retardation persisted. Extra feeding of 25 mg. of DL-*alpha*-tocopherol acetate (and other fat-soluble factors) gave mild protection. Peroxides were probably not responsible for the toxic effect of the heated and aerated cottonseed oil; polymerization might be a better explanation.

The relation of age to fat absorption in adult women together with observations on concentration of serum cholesterol. Pilar Garcia, Charlotte Roderuck, and Pearl Swanson (Home Econ. Res. Dept., Iowa Agr. Exp. Station, Ames). *J. Nutrition* 55, 601-09 (1955). The pattern of fat absorption changed with advancing age. The maximum number of chylomicrons appearing in the blood after a standard test meal increased with advancing age. The longer the period required to reach a peak count, the greater the number of chylomicrons in the blood at the time. Concentrations of serum cholesterol increased with age up to the 7th decade when a decrease occurred. The peak chylomicron count following a high fat test meal showed the same trend, but no statistically significant relationship was found between serum cholesterol concentrations and the peak chylomicron count. Thus, serum cholesterol might not be related to the pattern of fat absorption.

Influence of fats in rations on storage quality of poultry. M. I. Darrow and E. O. Essary (Swift and Co., Res. Labs., Chicago, Ill.). *Poultry Sci.* 34, 427-31 (1955). It would appear that tallow, soybean and cottonseed oil up to a 10% level may be added to broiler rations without adversely affecting the storage quality of poultry held at 0°F. of lower for 9 months.

Effect of choline administration on the oxidation of fatty acids by extrahepatic tissues. C. Artom (Dept. of Biochem., Bowman Gray School of Medicine, Wake Forest College, Winston-Salem, North Carolina). *J. Biol. Chem.* 213, 681-87 (1955). Homogenates of the liver, kidney, heart, brain, and testis from rats maintained on low protein diets were incubated in air with palmitate-1-C^{14}, and the amounts of $C^{14}O_2$ produced during the incubation were determined. Following the injection of choline shortly before the animals were killed, higher $C^{14}O_2$ values were obtained in liver and often in kidney and heart also. When choline was given both as a dietary supplement and by injection terminally, $C^{14}O_2$ production was generally enhanced in all three tissues to about the same extent.

Mechanism of intestinal fat absorption in the cat. Sune Bergström, B. Börgström, and A. Carlsten (Univ. Lund, Sweden). *Acta Physiol. Scand.* 32, 94-8 (1954). The intestinal absorption of C^{14}-labeled stearic acid was studied in unanesthetized cats with an intestinal lymphatic-duct fistula. A higher absorption was observed than found in the anesthetized cat. The labeled fat was recovered from the lymph to the extent of 23-72% of the amount fed. No difference in the route of absorption was observed for stearic acid when fed as a glyceride or when dissolved in free fatty acids. The distribution of the label in the lymph glyceride and phospholipids showed that extensive hydrolysis had taken place. (*C. A.* 49, 6399)

The intestinal absorption of linoleic-1-C^{14} acid. R. Blomstrand (Univ. Lund, Sweden). *Acta Physiol. Scand.* 32, 99-105 (1954). Linoleic-1-C^{14} acid was fed in various mixtures to rats and the thoracic-duct lymph collected. The major portion of the absorbed labeled material was recovered in the lymph neutral fat regardless of the form in which it was fed. Some of the activity was recovered in the expired CO_2 (5% in 24 hours). Data for palmitic, oleic, and linoleic acids were compared, and no differences were found in the route of absorption of saturated and unsaturated long-chain fatty acids. (*C. A.* 49, 6399)

Conversion of 1-C^{14}-cetyl alcohol into palmitic acid in the intestinal mucosa of the rat. R. Blomstrand and J. A. Rumpf (Univ. Lund, Sweden). *Acta Physiol. Scand.* 32, 374-86 (1954). Cetyl alcohol labeled with C^{14} was fed to rats with a thoracic-duct fistula. More than 50% of the activity was present in the lymph as unchanged cetyl alcohol. The remainder had been oxidized to palmitic acid and as such incorporated into the lymphatic triglycerides. The main part of the oxidation process took place during the passage of the lipides through the intestinal mucosa. (*C. A.* 49, 6399)

The state of cholesterol and phospholipides in the brain tissues of animals. S. V. Nedzetskiĭ and S. S. Ratnitskaya (Sanit-Hyg. Med. Inst., Leningrad). *Biokhimiya* 19, 677-82 (1954). Blood vessels and dura of cattle brains were removed. Tissues were ground with glass in 0.9% NaCl and centrifuged. The sediment was extracted successively with 0.9% NaCl, 7% NaCl (twice), and 0.25% NaOH, the solution being removed each time by centrifuging. The NaCl solvents extracted 24-27% of the cholesterol from the gray matter of the brain, 6-8% from the white matter, and 11-18% from the cerebellum. In these extracts the cholesterol is in combination with the brain proteins. By the same processes 33-45% of the phospholipides are extracted from the gray matter, 27-33% from the white matter, and 36-45% from the cerebellum. About 50% of the phospholipides thus extracted are not in union with the proteins, or united in only a weak manner. The 0.25% aq. solution of NaOH extracts the remainder of the cholesterol and phospholipides which are in combination with the brain tissue proteins. These are easily precipitated by HCl and again redissolved in NaOH without any change in their original complex structure. (*C. A.* 49, 6418)

Unsaturated fatty acids and carcinogenic hydrocarbons. II. G. De Angelis, W. Ciusa, and G. Nebbia (Univ. Bologna, Italy). *Acta Vitaminol.* 8, 161-3 (1954). The oral administration of a 4% emulsion of unsaturated fatty acids to white rats painted with 3,4-benzopyrene shortens the latent period and increases the tumor incidence. (*C. A.* 49, 6436)

• Waxes

R. L. Broadhead, Abstractor

The application of chromatographic technique to the determination of a hydrocarbon fraction in carnauba and ouricuri wax. E. A. Wilder. *Proc. Chem. Specialties Mfrs. Assoc.*, May, 1954, 125-7. The normal hydrocarbon content of these 2 waxes has been determined as 2% by a method involving elution of the hydrocarbon with heptane at 50° from a sample of wax chromatogrammed on a column of activated Al_2O_3 under specified conditions. (*C. A.* 49, 5864)

"AMP" as an emulsifying agent in self-polishing waxes. J. A. Frump (Commercial Solvents Corp., Terre Haute, Indiana). *Soap and Chem. Specialties* 31, No. 2, 153, 155, 161, 163 (1954). The qualities of the commercial emulsifier, "AMP" (Me_2-$[NH_2]CCH_2OH$), for making wax emulsions is demonstrated and compared with use of triethanolamine and morpholine as emulsifiers for the same purpose. (*C. A.* 49, 5006)

Douglas fir wax. E. F. Kurth(Oregon State Board of Forestry). *U. S. 2,697,717.* The hardness and m.p. of Douglas fir wax (I) are improved by treating the aliphatic or aromatic soluble portion of I with 0.1-10% of a basic compound of Pb or any metal of Group II of the periodic table. I can be bleached first with oxalic or sulfurous acid. Reaction with melted I can be carried out at a temperature up to 150°. The temperature is limited only by b.p. in the case of water or solvent. A product treated with sulfurous acid and then CaO melted at 82-5° and had a hardness of 0.6 mm. The process is not suitable for carnauba, candelilla, or beeswax. (*C. A.* **49**, 5866)

Separation of mixed wax esters. Satoshi Nakajima and Kiichi Kosuge(Sogo Chemical Co.). *Japan 2982(1954).* A mixed wax ester (300 g.), I no. 80, obtained by distillation of sperm oil in vacuo is dissolved in 600 g. petroleum naphtha-xylene (2:1). The mixture is cooled gradually to 5°. The solid portion is filtered, and the solvent removed to give 30 g. solid wax ester, m. 48.3°, I no. 7.3. The liquid portion gives 270 g. liquid wax, m. 5°, I no. 87.3. (*C. A.* **49**, 5010)

• Drying Oils

Raymond Paschke, Abstractor

Coatings. R. W. Stafford and W. G. Deichert(American Cyanamid Co.). *Anal. Chem.* **27**, 606(1955). A comprehensive biennial review of important developments on the analysis of coatings reported in papers published from November 1952 to October 25, 1954. 37 references.

The swelling behavior of conjuene and isolene oils. J. D. v. Mikusch and K. Mebes(F. Thorl's Ver. Harburger Oelfabriken A. G., Hamburg-Harburg, Ger.). *Farbe u. Lack* **61**, 9-16(1955). Films of natural and isomerized linseed and conophora oils and of safflower, dehydrated castor, and tung oils were examined for rates of water absorption. (*C. A.* **49**, 5858)

Some products of the heat-thickening of linseed oil. J. J. Sleightholme and A. J. Seavell(Smith and Walton Ltd., Holtwhistle, England). *Oil Colour Chemists' Assn. J.* **38**, 178(1955). The passage of inert gas over the surface of linseed oil during heat thickening increases the amount of material distilling over but does not affect its nature nor influence the course of the reaction. The passage of air over the surface, on the other hand, causes some decomposition, with the formation of water, lower fatty acids and aldehydes: the amount of distillate is increased. Ultra-violet spectroscopic examination of the free acids present in stand oil and of the acids produced by saponifying stand oil gives little information about the composition. Low temperature crystallization seems to offer better prospects of success in this field. The free acidity in a linseed stand oil is not due entirely to the presence of monomeric fatty acids of the linseed oil type: complex acidic glycerides are present which may be of very high molecular weight. The presence of such compounds probably accounts for the livering with zinc oxide of certain highly polymerized oils of comparatively low acid value.

Distilled dehydrated castor oil fatty acids. R. Rowe(Victor Wolf Ltd., Manchester, England). *Paint Technol.* **19**, 79 (1955). This review discusses the early work, the Scheiber patents, the dehydration of ricinoleic acid, the degree of conjugation obtained, methods for determining total unsaturation, the composition and behavior in drying oil compositions, the alkyd and epoxy resins, and the new uses in urethanes, amides, and vinyls.

Action of various inorganic chlorides upon tung oil. J. Petit and J. Cazes(Centre natl. recherche sci., Bellevue, Paris). *Bull. soc. chim. France* **1954**, 1428. Refined tung oil was treated with inorganic chlorides dissolved in organic solvents. Gelation occurred on addition of $AlCl_3$ (10% in nitro-benzene), $SnCl_4$ (16.7% in CCl_4), $TiCl_4$ (4-16.7% in CCl_4), $SbCl_3$ (5-10% in $CHCl_3$), $FeCl_3$ (10% in Et_2O), $ZrCl_4$ (4% in Et_2O), and $BiCl_3$ (as the liquid complex with Et_2O). Hard, black grains appeared at once upon addition of the $AlCl_3$ solution; the other reagents gave, in the order shown, lighter colors and slower formation of gels. $AsCl_3$ (25% in Et_2O) blackened the oil but gave no gel, while $SiCl_4$ and PCl_3, added pure or in CCl_4 solution, were without effect. The hypothesis is set forth that gelation is caused by bridges formed between adjacent unsaturated glyceride molecules. (*C. A.* **49**, 4999)

Some details of oil-reactive phenolic resins. C. P. A. Kappelmeier. *Paint Oil Colour J.* **127**, 260(1955). A history of the development of these resins is given. Several tung and linseed oil formulations are described.

The chemistry of styrenated oils. J. B. Crafts(Paint Res. Sta., Teddington, England). *J. Appl. Chem.* **5**, (1955). The interaction of styrene with the methyl esters of a number of drying-oil acids and with a dehydrated castor oil has been studied. The experiments were carried out under a single set of reaction conditions, at 140° in the absence of oxygen or added catalyst. The products were separated into four types and their nature elucidated by chemical and spectroscopic analysis and molecular weight determination. Both the conjugated-triene (α-elaeostearic) and conjugated-diene (9:11-linoleic) systems formed true copolymers of high molecular weight with styrene, and also Diels-Alder adducts containing one styrene molecule combined with one fatty ester molecule. The non-conjugated linoleic and linolenic esters did not copolymerize with styrene. With methyl 9:12-linoleate the high-molecular-weight product was almost indistinguishable from polystyrene. With methyl 9:12:15-linolenate it was found that a small proportion of ester was attached to the polymer chain, probably by chain transfer. With dehydrated castor oil containing a mixed ester of conjugated and non-conjugated acids, copolymers of relatively low ester content were obtained, and not mixtures of copolymers and polystyrene.

Methods and materials for preventing the skinning of paint. H. J. Clarke and M. H. M. Arnold(Sutton Coldfield, Warwickshire, England). *Oil Colour Chemists' Assn. J.* **38**, 191(1955). The skinning of paint may be prevented by preventing access of oxygen, by dissolution of the skin, or by inhibiting the skin-forming reaction. The behavior of the commercial anti-skinning agents, butyraldoxime and tert.-butyldimethylphenol, has been studied in eleven paints and varnishes. The difficulty of preventing skinning without spoiling drying has been fully confirmed, but vehicles attaining touch-dryness principally by evaporation, such as styrenated alkyds, may be treated with anti-skinning agents with some confidence. Tert.-butyldimethylphenol is to be preferred in alkyds and heavily leaded linseed copal varnish, and butyraldoxime in rosin-based resins. But the difference is not large and may be outweighed in practice by the lower price of tert.-butyldimethylphenol. Suitable concentrations for both materials are in the range 250-2,500 p.p.m. of total paint.

Linseed and linseed oil—a world survey. Anon. *Paint Oil Colour J.* **127**, 717(1955). The world production of linseed from June 1953 to May 1954 was 3.0 million tons. Production for the previous year was 3.2 million tons. The U. S. production for 1954 was 1.04 million tons.

Drying oil technology. Part IV. Chemical processing. Anon. *Paint Varnish Production* **45**(5), 34(1955). Discussed are (1) esterification with higher alcohols, (2) varnish "cooking," (3) polyesterification, (4) removal of keto or hydroxy groups, (5) isomerization, (6) dimerization and polymerization, (7) halogenation and dehalogenation, (8) oxidative degradations, (9) epoxidation, (10) maleinization and Diels-Alder condensations, and (11) copolymerizations.

Mixed esters and coating compositions containing the esters. N. V. de Bataafsche Petroleum Maatschappij. *Dutch 76,235.* Polyhydric alcohols are esterified partly with an aromatic monocarboxylic acid having one of its ring C atoms coupled with an open-chain aliphatic radical which contains a quaternary C atom, and partly with an unsaturated monocarboxylic acid. Preferably 25-75% of the OH groups is esterified with the first, and the rest with the second acid. Instead of direct esterification, preparation of the mixed esters can be carried out by exchange of ester groups. Examples of the first type of acid are p-tert-butylbenzoic acid or its substitution products, or 4-tert-butyl-1-naphthoic acid. Examples of the second type are the free fatty acids or the monoglycerides derived from drying or semidrying oils, rosins, or tall oil. The alcohols are glycerol, pentaerythritol, aliphatic diols, or polyvinyl or polyallyl alcohols. An additional esterification of the mixed esters can be carried out with a third type of acid, such as phthalic, succinic, or maleic acid. The esters are valuable components of varnishes and lacquers. They have the special advantage of miscibility with cellulose lacquers. (*C. A.* **49**, 6622)

• Detergents

Lenore Petschaft Africk, Abstractor

Development and production of new surface-active agents from albumins. P. Struve. *Seifen-Ole-Fette-Wachse* 81, 4-5(1955). A review on detergents based on albumins and their use in combination with alkylarylsulfonates and soaps. (*C. A.* 49, 5864)

Micellar self diffusion of sodium lauryl sulfate. D. Stiger, R. J. Williams, and K. J. Mysels (U. of Southern Calif., Los Angeles). *J. Phys. Chem.* 59, 330-5(1955). The recently developed porous disc method has been used to determine the self-diffusion coefficient of micelles formed by sodium dodecyl sulfate in water and in salt solutions, using a water-insoluble dye to tag the micelles. A strong concentration dependence of the self-diffusion coefficient in water has been found. The presence of salt greatly reduces this concentration effect. Extrapolation to the critical micelle concentration leads to an estimate of the size of the micelles. Assuming a spherical shape, comparison with known molecular weights permits an estimate of hydration. A monomolecular layer of water of hydration accounts best for the results.

Interpretation of conductivity of soap solutions. D. Stigter (van't Hoff Lab., Utrecht, Neth.). *Rec. trav. chim.* 73, 611-25 (1954) (in English). Differential equivalent-conductivity curves for micellar soap solutions are interpreted in terms of the size distribution of the micelles. A continuous decrease in differential conductivity with concentration is attributed to the formation of micelles of almost uniform size. The equivalent conductivity of the micellar soap can be obtained from the conductivity data in the region above the critical micelle concentration. Application of the law of mass action to the data in the region of the critical micelle concentration leads to the molecular weight of the micelles. The maximum in the conductivity curves just before the critical micelle concentration is attributed to a wide size distribution of the micelles. (*C. A.* 49, 4374)

New method for determination of foaming power. J. P. Sisley and M. Loury (Institut des Corps Gras, Paris). *Soap Chem. Specialties* 31(4), 44-6, 99(1955). A new "mixer" type of apparatus for determining foaming power is described and results compared with the Ross-Miles method.

Method of boiling 60% household soap without settling. A. N. Sheiko, L. L. Razgon, and N. T. Komardin. *Masloboino-Zhirovaya Prom.* 19(8), 20-2(1954). In this process stock is boiled with enough soda and soda ash to saponify 60% of fatty, naphthenic, and resin acids. Carbonic saponification is replaced by that of caustic at the point when fatty acids and calcined soda concentrations in the soap are 60-70 and 0.35% respectively, and fatty acidity in "carbonated mass" is 20-5%. Toward the end of the boiling operation the soap should contain free alkali 0.15-0.2, fatty acids 62-3.5, calcined soda 0.15-0.3, and salt 0.3-0.4%. (*C. A.* 49, 5008)

The effect of aliphatic detergents on the mechanical stability of polystyrene latex. C. P. Roe and P. D. Brass (U. S. Rubber Co., Passaic, N. J.). *J. Colloid Sci.* 10, 194-205(1955). The mechanical stability of polystyrene emulsions is greatly affected by the nature and surface concentration of adsorbed ionic detergents. The electrokinetic potential of the particles in soap-protected polystyrene emulsions is not affected by surface concentration of adsorbed soap. The variation of mechanical stability of polystyrene emulsions with adsorbed soap may probably be largely accounted for by steric interference of the adsorbed carbon chains. Work with a nonionic emulsifier indicates that mechanical stability of a protected lyophobic colloid probably depends on both steric and electrical factors.

X-ray crystallography of the sodium n-alkyl sulfates. F. F. Rawlings, Jr., and E. C. Lingafelter (U. of Washington, Seattle, Wash.). *J. Am. Chem. Soc.* 77, 870-2(1955). An X-ray crystallographic study has been made of the sodium *n*-alkyl sulfates, for comparison with previous studies of the sodium 1-alkanesulfonates. Six distinct phases are reported, one of which is very similar to the a-phase of the sulfonates. Unit cells and space groups are given for all six phases.

Nonionic detergents. J. V. Karabinos, J. J. Hazdra and G. E. Kapella (Blockson Chem. Co., Joliet, Ill.). *Soap Chem. Specialties* 31(4), 49-50, 114(1955). New methods are described for estimation of molecular weight and/or ethylene oxide chain lengths of nonionics.

Launderomatic evaluation of some cellulose derivatives. J. V. Karabinos (Blockson Chem. Co., Joliet, Ill.). *Science Counselor* 17, 129, 156(1954). Carboxymethylcellulose (I) improves the soil-suspending power of built detergent mixtures. Among cellulose derivatives I was best for the purpose; lignin was good; the cellulose carboxylate obtained by oxidizing cellulose with N_2O_4 for 24 hrs., was only fair. Poor soil-suspending power results occurred with the sulfate, succinate, maleate, allyl-, hydroxy-ethyl-, or other oxy-cellulose. Soluble starch, heparin, lactalbumin, hydroxypropyl starch, mucoitin sulfate, and agar were slightly active. (*C. A.* 49, 5007)

A comparative study of non-ionic detergent adsorption by radiotracer, spectrophotometric and surface tension methods. L. Hsiao and H. N. Dunning (Bureau of Mines, Bartlesville, Okla.). *J. Phys. Chem.* 59, 362-6(1955). A comparative study of the adsorption of non-ionic alkyl aryl polyoxyethylated detergents on sand by different methods has been made in an attempt to determine the fundamental mechanisms of non-ionic detergent adsorption. The techniques used in this study were: (1) the radiotracer method with which the C^{14}-tagged ethylene oxide chains were traced; (2) the spectrophotometric method, with which the phenol groups were determined; and (3) the surface tension method, with which the surface-active species were determined.

The preparation of model long chain alkylbenzenes and a study of their isomeric sulfonation products. F. W. Gray, J. F. Gerecht and I. J. Krems (Colgate-Palmolive Co., Jersey City, N. J.). *J. Org. Chem.* 20, 511-24(1955). The hydrocarbons 1-phenyloctane, 1-phenyldodecane, 2-phenyltridecane, and 5-phenyldodecane have been prepared and sulfonated. The isomers obtained upon sulfonation have been isolated as their sodium salts and identified by derivative formation and infrared spectra. The position of the sulfonate group in the benzene ring as well as the position of the phenyl group and length of the alkyl chain have a pronounced effect upon the surface active properties of sodium alkylbenzenesulfonates. The ortho sulfonates have lower surface tension values, are better wetting agents and give higher foam heights than their respective para isomers. In detergency, the para compounds are superior to their ortho isomers. Also, as the phenyl group is moved toward the center of the chain of an alkylbenzene, the yield of ortho isomer obtained on sulfonation decreases. The para isomer formed from a hydrocarbon in which the phenyl group is located about the center of the alkyl chain possesses physical and chemical properties that resemble an ortho isomer obtained from a compound containing the phenyl group located at end of the chain.

Analytical study of polymerized linseed oils. H. Vaillant. *Revue Francaise des Corps Gras* 2, 21-27, 159-165(1955). The physical and chemical tests used in evaluating polymerized linseed oils are reviewed. Ninety-two references.

Drying oils. Saad Maccar (Alexandria Univ.). *Oil & Soap* (Egypt) 2(2), 35-40(1955) (in Arabic). The results of an extensive survey are given covering kinds of drying oils, sources, methods of refining and processing, additives and their effects, and the mechanism of drying. 26 references.

Carboxymethylcellulose in soap-containing laundering compounds for white fabrics. G. Carriere and Jr. P. Burger (Unilever Research Lab., Vlaardingen, Neth.). *Fette u. Seifen* 55, 845-6(1953). According to microlaunderometer tests with cotton cloth, detergency of soap powders was not improved significantly by Na carboxymethylcellulose (I). The ability to suspend dirt was increased by I; this effect was of importance only at low soap concentrations in hard H_2O. Although some soap can be replaced by I, the only advantage might be an economic one. (*C. A.* 49, 3558)

Long-chain aliphatic ether-amides in detergent compositions. J. R. Trowbridge II (Colgate-Palmolive Co.). *U. S. 2,704,289.* A detergent composition with improved foaming and detersive properties is prepared by adding to water-soluble anionic organic sulfate and sulfonate detergent an organic builder such as a higher alkoxy substituted lower aliphatic amide, e.g. B-*n*-dodecoxypropionic monoethanolamide.

Improvements in detergent compositions. Unilever Ltd. *Brit. 723,212.* The detergent properties of organic ionic soapless detergents are improved by the addition of alkanolamides such as *p*-tert-octylphenoxy-α-propionethanolamide or n-decyloxyacetethanolamide.