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

• Oils and Fats

Ralph W. Planck, Abstractor
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Proposed AGMARK grade designations. *Oils and Oilseeds J.* **6**(1), 14(1953). The Ministry of Food & Agriculture, Directorate of Marketing and Inspection, India, has established Agmark Specifications for several vegetable oils—peanut, sesame, castor, mahua, linseed, and cottonseed.

Some less known oilseeds of India. J. S. Aggarwal (Natl. Chem. Lab., Poona). *Oils and Oilseeds J.* **5**(10/12), 19-21(1953). Some oilseeds produced in India are not harvested; others are harvested but not processed to recover their oil. Kamala *(Mallotus philippinensis)* yields a tung oil substitute. Tobacco seed and poppy seed are available in large quantities. Perilla, candle nut, stillingia, hempseed, and walnut oils can be produced in smaller quantities. Nim *(Melia indicata)*, *Pongamia glabra*, *Calophyllum inophyllum*, and *C. wightianum* are plentiful but their oils are not popular because of dark colors and unpleasant odors. Pisa seeds yield a fat that is largely tri-laurin. Only 5% of India's cottonseed is pressed for oil, the remainder being used for cattle feed. Full use of these oilseeds would alleviate India's oil shortage.

Determination of vitamin A in cod-liver oil and vitamin oils. Olaf R. Braekkan and Georg Lambertsen. *Fiskeridirektoratets Skrifter Ser. Teknol. Undersokelser* **2**(9), 1-20(1952). Thirty-five samples of commercial Norwegian fish-liver oils and vitamin concentrates were analyzed by methods based on the recommendations of the Subcommittee on Fat Soluble Vitamins of the World Health Organization *(I)*, the chromatographic procedure of Gridgeman *(II)* (*C. A.* **45**, 9587), and the correction equations of Cama, Collins, and Morton (*C. A.* **46**, 2140). In using the method of *I*, EtOH was employed as the solvent, and the correction procedure of Morton and Stubbs (*C. A.* **42**, 4720) was applied to the absorption curve. The E(1%, 1 cm., 325 mμ) values agreed within ±3% before application of the corrections, and ±12% after application of the corrections. The corresponding figures for the U.S.P. XIV method were ±2% and ±6%, resp., and the corresponding figures for the (Brit. Pharmacopoeia, 1951 addition) method were ±2.5% and ±15%, resp. All the variously corrected E values were lower than those obtained by the chromatographic method of *II*, especially if the correction equations were built on the new curves for all-*trans* vitamin A. The (Brit. Pharmacopoeia, 1951 addition) addition values for the unsapon. matter gave a mean that was only 81% of the *II* values. This low value of the mean was caused, in part, by the low E(1%, 1 cm., max.) value of 1750 for vitamin A in cyclohexane as compared with the E value of about 1850 for vitamin A in EtOH or isopropanol. (*C. A.* **47**, 7736)

Chayen cold-rendering process for oils and fats. British Glues and Chemicals Ltd. *Soap, Perfumery & Cosmetics* **25**, 1263-4 (1952). Descriptive.

Fractionation of lipides by countercurrent partition chromatography on paper. Louis Douste-Blazy, Jacques Polonovski, and Paul Valdiguie. *Compt. rend.* **235**, 1643-5(1952). Two organic solvents, used simultaneously, one ascending, the other descending, satisfactorily separate lipides on a paper chromatogram. The sample to be analyzed is applied so that the two solvents will meet just above it. Human serum, an ovalolecithin, and cephalin from sheep brain are separated either with acetic acid and a mixture of petroleum ether and $CHCl_3$; or with acetic acid, water and methanol, and a mixture of petroleum ether and $CHCl_3$; or with acetic acid, water and methanol, and aqueous methanol. The spots are detected with Sudan black for glycerides, sterides, and cephalins; phosphomolybdic acid followed by $SnCl_2$ for lecithins and sphingomyelins; ninhydrin for cephalins and accompanying amino acids; and silico- or phosphotungstic acid for cholesterol. (*C. A.* **47**, 5981)

Double-bond reactivity of oleic acid during flotation. A. M. Gaudin and R. E. Cole. *Trans. Am. Inst. Mining Met. Engrs.* **196**, *Tech. Note* 144-B (in *Mining Eng.* **5**(4), 418(1953). Since it appeared possible that the value of oleic acid as a flotation collector was related to the oxidizability of its double bond, floated fluorite was leached with a solvent capable of extracting the adsorbed reagent and the extract was analyzed. It was concluded in the case of fluorite and C-18 fatty acids having 1 or 2 nonconjugated double bonds that there is practically no change of the fatty acid molecule or ion during the flotation operation. The extraordinary utility of these reagents is related to some property of the compounds other than the oxidizability of their double bonds. (*C. A.* **47**, 5732)

Kinetics of butter formation. A. Grishchenko (Refrig. and Dairy Inst., Leningrad). *Molochnaya Prom.* **14**(4), 28-32 (1953). Consideration of the hydrodynamic principles involved in the motion of fat droplets during butter churning and suitable experiments show that butter can be produced even at 2° although the length of the process is greatly increased. In the temp. range 2-6° the time of churning is given by $C/2t^2$; between 6 and 16° it is C/t^2, and between 16 and 24° it is $2C/100 \times 2.3 \times \log t^2$, where C is a constant 32,000 and t is time in sec. In a more detailed consideration time of churning $= [(\ln n_0 - \ln n)(1 - a)s]/[kv^2t^2b^3(1 + a)\phi\nu]$, where k is a constant, ϕ is coefficient of effectiveness of particle collision, ν is coefficient characterized by the mechanism used for stirring and churning, n_0 is initial no. of fat droplets per unit volume and n is the no. of droplets after the given passage of time. (*C. A.* **47**, 7688)

Role of antioxidants during stabilisation of vitamin A in shark liver oil. G. G. Kamath and N. G. Magar (Inst. of Sci., Bombay). *J. Indian Chem. Soc.* **30**, 335-41(1953). Antioxidants, N. D. G. A. and propyl gallate, effectively stabilize vitamin A from shark liver oil as observed by aeration and storage; 2,6-Di-*tert.*-butyl-*p*-*cresol* was less effective and B. H. A. was ineffective. Waghbeer *(Galeocerdo tigrinus)* liver oil, containing a small amount of vitamin A is more stable than Khada Mushi *(Carcharinus melanopterus)* or Pisori *(Carcharinus limbatus)* liver oils containing higher amounts of vitamin. Antioxidants are more effective at lower temperatures of storage, if the oil contains negligible peroxide. In ultraviolet light, the antioxidants lose the protective property and vitamin A is destroyed rapidly.

The fat in our food. J. H. van de Kamer (Centr. Inst. Voedingsond. T. N. O., Utrecht, Netherlands). *Voeding* **14**, 109-22 (1953). The composition (especially in regard to fatty acids), processing, keeping quality, digestibility, etc., of oils and fats used for human consumption in the Netherlands are discussed. (*C. A.* **47**, 6064)

Lipoxidase in the flesh of British Columbia herring. M. M. R. Khan (Univ. Brit. Columbia). *J. Fisheries Research Board Can.* **9**, 393-416(1952). From the dark muscle of the herring *Clupea pallasi*, highly active enzyme was isolated by various physical and chemical methods of fractionation and finally by electrophoresis. The assay method of Theorell, *et al.*, was used, with linoleic acid as the substrate; the products of the reaction were measured spectrophotometrically. The "lipoxidase" isolated was found to be 2000 times as active as the raw material. It is a proteinaceous, heat-labile enzyme capable of peroxidizing naturally occurring unsaturated fatty acids and fatty acid esters, particularly those containing methylene-interrupted double bonds. It exhibits optimal activity at 15° and at pH 6.9, but fails to catalyze unless some Fe-containing, organic, heat-stable activator is present. (*C. A.* **47**, 5972)

Wet-steam and dry (autoclave-vacuum) methods of production of fat. I. I. Khar'kov. Rybnoe Khoz. 1952(9), 21-4. Flow sheets, descriptions, and use of equipment for isolation and rendering of fats from fish raw materials by the autoclave-vacuum method are given. (*C. A.* **47**, 6153)

Theory concerning the mechanism of fatty acid oxidation and synthesis, and carbon dioxide fixation. Henry A. Lardy (Univ. of Wisconsin, Madison). *Proc. Natl. Acad. Sci. U. S.* **38**, 1003-13(1952). Review with 69 references.

Use of ascorbic acid and tocopherol in controlling oxidized flavor in frozen storage cream. Arnold C. Smith, Morrison Loewenstein, R. E. Anderson, and H. C. Olson. *Milk Plant Monthly* **41**(5), 26-30(1952). Ascorbic acid was effective but α-tocopherol was ineffective.

Modified method for determining peroxides in fat. L. Starikova. *Myasnaya Ind. S. S. S. R.* **24**(2), 72-3(1953). The method for peroxide value of fats of Drozdov and Starikova (*C. A.* **45**, 9281) is slightly modified. Data are recorded from analysis of several samples by procedures based on the use of glacial AcOH, H_2SO_4-pyridine mixture, and H_2SO_4-dimethylamine mixture, resp., in the fat solvent. (*C. A.* **47**, 7795)

Quality, stability, and peculiarities of butter prepared by the Meleshim method. A. Titov. *Molochnaya Prom.* **14**(4), 13-16 (1953). The butter made by the Meleshin method has higher nonfat solids contend and lower content of air owing to its production in a closed system without access of air. The aqueous capillaries in the finished product are finer than found in ordinary butter, leading to better stability and resistance to molds. The diameter of droplets is small (8-10 max.). The product has higher than normal mechanical strength and viscosity and is much more resistant to development of bacterial cultures. (*C. A.* **47**, 7688)

Characterization of refined oil of olive pulp. J. Vizern. *Ann. fals. et fraudes* **46**, 31-5(1953). The olive oils extracted from press residues contain waxes which are not saponifiable and are of low solubility. The nonsaponifiable fraction is extracted from 5 g. oil with petroleum ether, dissolved by refluxing with 10 cc. of 85% EtOH, and kept at 20-25° for 1 hr. No turbidity appears with pure virgin oil but a 5-10% admixture of extracted oil gives turbidity. Of other oils; soybean, sunflower, carthamus, rapeseed, and raisin seed oils, give more or less turbidity in this test, but arachis oil remains clear. (*C. A.* **47**, 6156)

Improved molecular distillation apparatus according to Utzinger, and its application to fat chemistry work. W. Wachs (Tech. Univ., Berlin-Charlottenburg). *Z. Lebensm.-Untersuch u.-Forsch.* **96**, 168-73(1953). The flowing film molecular distillation apparatus is improved by the following: *(a)* a newly designed ground-glass joint, *(b)* equalizing pressure in the filling flask and apparatus by means of a connecting tube, *(c)* reduced mixing of oil with thickened fat, *(d)* special thickening regulation, and *(e)* prewarming the charge. The apparatus is demonstrated with data on separation of sesamolin from sesame oil and separation of monoglycerides from a technical glyceride mixture. (*C. A.* **47**, 6153)

Technology of Vologda butter. A. Zheltakov and V. Shershneva. *Molochnaya Prom.* **14**(5), 12-18(1953). A process is described for pasteurization of cream so that a flavor, known as Vologda flavor, is imparted to butter. The plasma content of the cream, the heat-treatment of cream, the size of the butter-granules, and the washing of butter are responsible for differences in flavor and stability of butter stored at —4 to —12°. The desired result was achieved by heating the cream containing 25-8% of fat at 95° for 10-20 min. and immediately cooling to 0.5-1°, a surface cooler being used, forming butter granules with diameters of 4-6 mm., and washing the butter once with an equal wt. of water. (*C. A.* **47**, 7688)

Phosphatide analogs. The synthesis of glycollecithins and bis-(glycol)-phosphatidic acids. E. Baer (Univ. of Toronto). *J. Am. Chem. Soc.* **75**, 5533(1953). A new class of phosphatides and a generally applicable method for the synthesis of its members was described. The new phosphatides, which can be regarded as analogs of both the lecithins and lysolecithins, and which differ from these substances only in that they contain glycol instead of glycerol, have been assigned the generic name "glycollecithin." A general procedure was described for the synthesis of bis-(glycol)-phosphatidic acids which, in the form of the phenyl esters, were obtained also as by-products in the synthesis of the glycollecithins.

Certain characteristics of the fatty acids from the lipides of the tubercle bacillus. J. Cason, G. Sumrell, C. F. Allen, G. A. Gillies, and S. Elberg (Univ. of California). *J. Biol. Chem.*, **205**, 435(1953). The fatty acids from the alcohol-ether-soluble lipides of three lots of tubercle bacillus have been investigated. Each lot of acids had a similar composition, consisting of three major components: 28 to 34 percent palmitic acid, 32 to 39 percent C_{18} and C_{19} acids, and 16 to 21 percent higher molecular weight acids, of which about one-third consisted of α-methyl-α, β-unsaturated acids.

Epoxy resins from bis-, tris-, and tetrakis-glycidyl ethers. E. C. Dearborn, R. M. Fuoss, A. K. MacKenzie, and R. G. Shepherd, Jr. (U. S. Testing Co.). *Ind. Eng. Chem.* **45**, 2715(1953). The reaction between polyglycidyl ethers and carboxylic acid anhydrides was studied, using the thermal yield point as the significant experimentally observed variable. Several compositions are described, together with the synthesis of several new intermediates.

The action of t-butyl hypochlorite on organic compounds. IV. Cholesterol. D. Ginsburg. *J. Am. Chem. Soc.* **75**, 5489 (1953). t-Butyl hypochlorite added to the double bond of cholesterol and oxidized the secondary alcoholic function to a carbonyl group. The primary reaction product was 6 beta-chloro-Δ^4-cholesten-3-one. Dehydrochlorination of this compound gave Δ-4,6-cholestadien-3-one which was isolated as its 2,4-dinitrophenylhydrazone. The mechanism of the reaction was discussed.

The chemical nature of the fatty acids of Lactobacillus casei. K. Hofmann and S. M. Sax (Univ. of Pittsburgh). *J. Biol. Chem.* **205**, 55(1953). The fatty acid "spectrum" of *Lactobacillus casei* has been determined with 2042 gm. of cells grown on a semisynthetic medium of low lipide content. The organisms have been found to contain 2.9 percent of lipides; of this 21 percent was extractable with acetone-ether ('free' lipides) and 79 percent is ether-soluble after acid hydrolysis of the extracted cells ('bound' lipides). The 'bound' lipides contained palmitic acid (23%), cis-vaccenic acid (38%), stearic acid (4%), and lactobacillic acid (16%). The composition of the 'free' lipides was essentially the same as that of the 'bound' lipides.

Determination of primary fatty amines in amine mixtures. J. E. Jackson. *Anal. Chem.* **25**, 1764(1953). A modification of the Wagner, Brown, and Peters method for the potentiometric titration of amines was described which makes possible the titration and differentiation of fatty amines of high molecular weight.

The equilibrium between symmetrical and unsymmetrical monoglycerides and determination of total monoglycerides. J. B. Martin (Procter and Gamble). *J. Am. Chem. Soc.* **75**, 5483 (1953). Perchloric acid as a catalyst isomerized 1- and 2-monoglycerides in chloroform solution to an equilibrium mixture containing about 90% 1-monoglycerides. 2-Monoglycerides did not react with periodic acid commonly used for the determination of monoglycerides; however, by application of the periodate analysis before and after perchloric acid isomerization, it was possible to determine 1-monoglycerides and total monoglycerides present in a mixture from which the original 2-monoglyceride content was readily obtained by difference. After isomerization, the total monoglyceride content of the fat was calculated by multiplying the percent 1-monoglyceride from periodic acid oxidation by a factor of 1.15 to convert from the equilibrium composition and correct for the slight effect of side reaction. The method is applicable to both saturated and unsaturated compounds; no interference from other fatty substances has been observed.

Preparation of saturated and unsaturated symmetrical monoglycerides. J. B. Martin (Procter and Gamble). *J. Am. Chem. Soc.* **75**, 5483(1953). A new method for the synthesis of 2-monoglycerides was reported. The acid-labile benzylidene group of 1,3-benzylidene-2-acylglycerols was split off by reaction with boric acid; the resulting borate esters were hydrolyzed by washing with water to yield 2-monoglycerides. Unsaturated symmetrical monoglycerides, namely, 2-monoolein, 2-monoelaidin, and 2-monolinolein were reported as new compounds.

Fatty acid amides. VI. Preparation of substituted amidostearic acids by addition of nitriles to oleic acid. E. T. Roe and D. Swern (Eastern Regional Research Lab.). *J. Am. Chem. Soc.* **75**, 5479(1953). The addition of acetonitrile, propionitrile, acrylonitrile, benzonitrile, cyanoacetic acid, malononitrile, and succinonitrile to the double bond of oleic acid in sulfuric acid solution gave good yields of substituted amidostearic acids. Best results were obtained in 95% sulfuric acid solution but other carbonium ion producers could be employed, although yields were low. Aminostearic acid, a compound which shows typical amino acid properties, could be prepared in excellent yield from acetamidostearic acid by hydrolysis with 50% aqueous sulfuric acid. Evidence was given for supporting the carbonium ion mechanism for the addition of nitriles to oleic acid.

Some fatty acids of peanut, hickory, and acorn oils. C. Y. Hopkins and M. J. Chisholm (NRC, Ottawa, Can.). The analysis of the three oils in percentages of the total fatty acids are given. Peanut oil *(Arachis hypogaea* L. var. *Spanish)*: archidic 1.5, behenic 3.4, eicosenoic 1.6, docosenoic 0.2; hexadecenoic could not be detected—if less than 0.3 present. Hickory nut oil (*Carya cordiformic* Koch): palmitic 6, stearic 1, higher saturated acids 0.5, oleic 72, linoleic 19; higher monoenoic acids could not be identified—if less than 1.0 present. Acorn oil (*Quercus alba* L.): palmitic 10, stearic 2, oleic 48, linoleic and other polyenoic 40; eicosenoic could not be detected—if less than 0.5 present.

Infra-red spectra of some vegetable oils. J. Barcelo and J. Bellanto. *Anales de la Real Sociedad Espanola de Fisica y Quimica* **49B**, 558-564(1953). Infra-red spectra were run on olive oil, soya oil, cottonseed oil, tobacco seed oil, grapeseed oil, and castor oil using NaCl and K Br prisms and a spectrum range of 2.5 to 28 microns. For purposes of relationship with the glycerides, the spectra of long chain fatty acids and glycerine are included. The characteristic bands of oils that are not present in the spectra of fatty acids have absorption maxima at 1270K, 1140K, 1115K, and 1095K.

Application of crystalline urea adducts to the chemistry of fats. IV. Separation of several mixtures of fatty products by means of urea. J. M. Martinez Moreno, A. Vazquez Roncero, and C.

Janer de Valle. *Anales de la Real Sociedad Espanola de Fisica y Quimica* **49B**, 639-644(1953). Mixtures of olive oil with stearic acid, olive oil with oleic acid, olive oil with fatty acid mixtures, stearic acid with abietic acid, oleic acid with abietic acid, and fatty acids with acids of the chaulmoogric series were fractionated by the urea adduct technique. Although the adduct forming parts of the various mixtures were not isolated in the pure form considerable separation was effected and the technique would appear therefore, to be useful for the laboratory and industrial fractionation of such mixtures.

Melting and solidification of milk fat. H. Mulder. *The Netherlands Milk and Dairy Journal* **7**, 149-174(1953). Attempts were made to find some relation between the various definitions and the observed results in the field of the melting and solidification of butter fat. A basic hypothesis, put forward by the author in 1938, that butter fat crystallizes in mixed crystals, was used in these studies. Dilatometers were used in an attempt to obtain quantitative data. The lower the temperature at which butter fat is caused to solidify, the lower is the ''melting point.'' The temperature at which the greater part of the melting takes place is determined first by the solidification temperature and not by the composition of the fat. Direct cooling of liquid fat causes more fat to solidify than does a step-wise cooling; similarly a larger proportion of a fat solidifies with rapid cooling than with slower cooling. This was explicable on the basis of the mixed crystal hypothesis. It was possible also, by means of this theory to predict that recrystallization can take place in a semi-solid butter fat which undergoes change of temperature so that the proportion of solid fat is altered. It follows from this that immediate equilibrium between solid and liquid fat is no more attained by increase of temperature than by reduction of temperature. As recrystallization proceeds slowly at low temperatures it is not possible to efface the pre-history of semi-solid fat by keeping it for a few hours at a low temperature. This is frequently overlooked even in melting point determinations. Liquid fat should be cooled rapidly to a temperature below the solid-liquid region before carrying out measurements of characteristic figures such as melting point, solidification point, melting interval, drop point, etc., in order to exclude the effect of the solidification temperature on these figures. The degree of dispersion of fat can affect the solidification. It is risky, therefore, to draw conclusions concerning the solidification of fat in milk, cream, and other dairy products from the results of experiments with melted butter fat. Butter fat can solidify into a glass-like state. It can exist also in a metastable form and show a double melting point. In the reported experiments the metastable form underwent fairly rapid transformation into the stable form.

Isomerization tests of the double bond of linoleic acid in grapeseed and soya oils. R. Pigamonti and F. Grosa. *Olearia* **7**, 183-187(1953). The isomerization of grapeseed oil and soya oil to form products containing conjugated double bonds was attempted by either prolonged heating with a nickel catalyst or short period heating with iodine or iodine compounds to effect the changes. Impurities that apparently are formed during the oil heating poisoned the nickel catalyst and little isomerization was effected unless a special grade of commercially available activated carbon was used as a carrier for the nickel. With this modification up to 17% conjugation was obtained. When the iodine or iodine compounds were used as catalysts the impurities also exerted some negative effects but to a much smaller extent that was the case with the nickel. After heating for 7 minutes at 300°C., followed by cooling in the presence of 0.3% of iodine up to 26% conjugation was obtained. Iodine was a more effective catalyst than the organic iodine compounds which were used in the experiments.

Screw press and solvent extraction. C. Chandler, W. C. Wittecar, B. H. Page, and O. J. Jones. *Oil Mill Gaz.* **58**(6), 25-30 (1953). Summary of the operating experience of the authors regarding the recovery of cottonseed oil.

PATENTS

Adhesive and disinfectant for tooth protheses. Max Müllner. *Austrian 174,700*, Apr. 25, 1953. A preparation consisting of a mixture of fatty oils, especially vegetable oils (castor oil) and EtOH to which BzOH and trichloroisobutyl alc. (>0.5% each) have been added, is used to impregnate the inner surface of tooth protheses. A thermal isolation which helps to avoid colds and which simultaneously acts as disinfectant is thereby obtained. The preferred composition of the mixture is 75 vols. EtOH, and 5 vols. oils. (*C. A.* **47**, 5639)

Refining of fatty glycerides. Lever Brothers & Unilever Ltd. *Brit. 676,574*, July 30, 1952. The loss of free oil in the alkali-refining of fatty glyceride stocks is reduced by adding small amounts of tartaric acid or salts to the caustic soda. Thus, when the free fatty acids are removed from soybean oil by the conventional dry method carried out in kettles, the addition of 0.1% tartaric acid, calculated on anhydrous basis, results in reductions in oil loss of 1.94-2.80%. Increasing the tartaric acid to 0.2% gives the same loss reduction, while 0.5% gives slightly poorer results. When centrifugal equipment is used, the loss reductions are 0.50-0.80%. Similar results are obtained in the refining of cottonseed oil. Tartrates, such as $Na_2C_4H_4O_6$, $KNaC_4H_4O_6$, and $KHC_4H_4O_6$, are not as efficient as the acid. (*C. A.* **47**, 6159)

Separating active catalyst from fatty materials by distillation. Noel H. Kuhrt and Distillation Products Industries (to Eastman Kodak Co.). *Brit. 682,625*, Nov. 12, 1952. Fatty acid partial esters of polyhydric alcohols can be separated from esterification catalysts by spreading the alcoholysis reaction mixture in a thin film on a heated surface under vacuum and distilling off the partial esters below the decomposition temperature of the catalyst. (*C. A.* **47**, 6158)

Apparatus for finely crystallizing liquid substances, such as ice cream, lard, and margarine, by cooling in motion. Erich Frauenstein. *Ger. 808,829*, July 19, 1951. Cl. 12c,2. (*C. A.* **47**, 5579)

Cooling device for plastic substances, such as butter, margarine, lard, and fat emulsions. Bergedorfer Eisenwerk A.-G., Astra-Werke (Hugo Melchert, Inventor). *Ger. 820,145*, Nov. 8, 1951. Cl. 17c,402.

Chamber cooler for plastic substances, such as butter, margarine, and lard. Bergedorfer Eisenwerk A.-G., Astra-Werke (Walter Schott, Hugo Melchert, Hermann Gebhart, and Wilhelm Hoer, inventors). *Ger. 820,146*, Nov. 8, 1951. Cl. 17c,402.

• Biology and Nutrition

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

The interrelationships of serum lipides in men and women past sixty-five years of age and their bearing on atherosclerosis. Menard D. Gertler and Bernard S. Oppenheimer. *Circulation* **7**, 533-44(1953). This study was made on subjects with normal lipide metabolism. Women had statistically higher levels of all serum lipides, except neutral fats, than the men. The values determined for women and men, resp., were: free cholesterol 74.2 ± 1.43, 60.2 ± 2.22; esterified cholesterol 208.1 ± 3.94, 167.7 ± 11.70; total lipides 981.2 ± 17.40; 755.3 ± 31.01; lipide P 12.2 ± 0.34, 10.3 ± 0.27; Svedberg units of flotation (S_f)10-20 mols. 70.3 ± 3.60, 57.4 ± 3.50; neutral fats 227.4 ± 7.50, 183.7 ± 21.90. The significance of these levels, in relation to the genesis of atherosclerosis, is discussed. (*C. A.* **47**, 5530)

Influence of cottonseed meal (in the ration) on the quality of milk and butter. I. Kokovkin. *Molochnaya Prom.* **14**(5), 31-3 (1953). When 50-100% of the grain concentrate in the ration was replaced by cottonseed meal, the fat content of the milk increased 0.15-0.30% on the average. Since there was an increased intake of protein, P, and amino acid lysine during the meal feeding, no significant difference was actually found in the nutrients required to produce a unit fat. When cottonseed meal was introduced into the diet, the volatile fatty acid content of butter decreased and its m.p. and hardness increased. However, the pH and sp. gr. of milk and the palatability of milk and butter were not affected. (*C. A.* **47**, 7697)

Vitamin E. The tocopherols. Henry A. Mattill (Finlay Inst., Havana, Cuba). *Borden's Rev. Nutrition Research* **13**, 109-20 (1952). A review with 48 references. (*C. A.* **47**, 6005)

Proteolytic and lipolytic properties of a strain of torula rhodense in butter. Ernest Miklik (Hochschule, Vienna). *Milchwissenschaft* **8**, 23-6(1953). Bacteriological studies with organoleptic tests on 3 samples of faulty butter showed that contamination with *Sarcoma lutea* and *Torula rhodense* resulted from contact with impure air. The yeast was shown to be responsible for the early manifestation of rancidity. A study of its proteolytic properties showed that in the presence but not in the absence of *Streptococcus lactis*, proteolysis of a meat extract, gelatin, skim milk, and agar medium took place, a phenomenon which was shown to be associated with the high acidity of the medium containing *S. lactis*. Further tests showed that rancidity was due to *Torula rhodense* in a medium made acid by the presence of lactic acid bacteria. (*C. A.* **47**, 5572)

Relation of deficiencies of vitamin A and essential fatty acids to follicular hyperkeratosis in the rat. V. Ramalingaswami and H. M. Sinclair (Univ. Oxford, England). *Brit. J. Dermatol.*

65, 1-22(1953). Deficiencies of essential fatty acids in the rat produce skin changes very similar to those seen in phrynoderma in man. This is not the case in vitamin A nor pyridoxine deficiencies. (*C. A.* **47**, 6007)

Role of choline in the oxidation of fatty acids by the liver. C. Artom (Wake Forest College). *J. Biol. Chem.* **205**, 101(1953). Slices, homogenates, or washed particles of the liver of rats, maintained on various diets, were incubated with C^{14}-labeled stearate or palmitate, and the radioactivity of the CO_2 evolved during the incubation was determined. The findings suggest that the lipotropic effect of choline may result, at least to a large extent, from the enhancement of fatty acid oxidation in the liver under the action of some substances formed from choline in vivo.

Insulin-reversible inhibition of glucose utilization by serum lipoprotein fractions. J. Bornstein (Washington Univ.). *J. Biol. Chem.* **205**, 513(1953). Lipoprotein fractions obtained from serum of diabetic rats by a flotation procedure or by fractionation with alcohol produced, in vitro, an insulin-reversible inhibition of the glucose uptake by diaphragm. The inhibitor was associated with the β_1-lipoprotein fraction and was inactivated by freezing or by standing in an ice bath. The serum of diabetic rats after removal of the lipoproteins by flotation was not inhibitory.

Cholesterol esterases. V. A cholesterol esterase of rat liver. J. E. Byron, W. A. Wood, and C. R. Treadwell (George Washington Univ.). *J. Biol. Chem.* **205**, 483(1953). The properties and specificity of a cholesterol esterase in rat liver extracts were reported.

Acetoacetate conversion to fatty acids in liver: the role of insulin and the nutritional state of the animal. R. W. Chen, D. D. Chapman, and I. L. Chaikoff (Univ. of California). *J. Biol. Chem.* **205**, 383(1953). The incorporation of the carbonyl carbon of acetoacetate into CO_2 and long chain fatty acids by surviving liver slices prepared from normal fed, normal fasted, fed diabetic, and insulin-treated fed diabetic rats was studied. The carbonyl carbon of acetoacetate was readily incorporated into long chain fatty acids by the liver of the normal fed rat. The capacity for this conversion was lost by the livers of the normal fasted and fed diabetic rat. Insulin injections into diabetic rats restored to normal the capacity of their livers to form fatty acids from acetoacetate.

The influence of sodium, potassium, and lithium on fatty acid metabolism. R. P. Geyer, M. F. Meadows, L. D. Marshall, and M. S. Gongaware (Harvard School of Health). *J. Biol. Chem.* **205**, 81(1953). The metabolism of octanoic acid-1-C^{14} by rat liver and kidney slices was studied with the use of incubation media in which potassium or lithium was varied at the expense of sodium. Both K and Li greatly increased the metabolism of octanoate by liver slices, and this increase was reflected predominantly in the radioactoacetate. Potassium but not lithium caused an increase in octanoate metabolism by kidney.

The estimation of fatty acid synthesis in rat liver slices. G. Medes, M. A. Spirtes, and S. Weinhouse (Institute for Cancer Research, Philadelphia). *J. Biol. Chem.* **205**, 401(1953). A method has been described for determination of rates of fatty acid synthesis in liver slices, which consisted in incubating slices of tissues with labeled acetyl precursors and comparing the specific activities of the acetoacetate and fatty acid.

Cofactor requirements for lipogenesis. J. Van Baalen and S. Gurin (Univ. of Pennsylvania). *J. Biol. Chem.* **205**, 303(1953). The aqueous particle-free system derived from pigeon liver has been studied further for its lipogenic activity. The system incorporated labeled acetate predominantly into fatty acids rather than into glycerides. By means of treatment with charcoal it has been possible to demonstrate a dependency of lipogenesis upon ATP, DPN, and CoA.

The biosynthesis of sphingosine. I. The utilization of carboxyl-labeled acetate. I. Zabin and J. F. Mead (Univ. of California). *J. Biol. Chem.* **205**, 271(1953). Carboxyl-labeled acetate was administered to weanling rats. Derivatives of sphingosine isolated from the brain and carcass were found to contain the tracer. Degradation of the dihydrosphingosine derivative revealed that carbon atoms 1 and 2 contained no tracer. The distribution of isotope in the remainder of the compound was consistent with the suggestion that a 16-carbon fatty acid-like intermediate was involved in the biosynthesis of sphingosine. The possible utilization of ethanolamine for carbon atoms 1 and 2 was discussed.

The lipid composition and water content of brain, heart, lung, liver, gut, and skin in the host component of the albino rat-walker carcinoma 256 dual organism. E. M. Boyd, H. D. McEwen, and M. N. Shanas (Queen's Univ., Kingston, Ontario). *Can. J. Med. Sci.* **31**, No. 6, 493-504(1953). The carcasses of albino rats bearing Walker carcinoma 256 contain, at or near death of the dual organism, concentrations of lipids and water in the direction of the concentrations of these constituents in the tumor component. Total lipid, neutral fat, total fatty acids, total cholesterol, ester cholesterol, free cholesterol, and phospholipid of these tissues were measured. Brain tissue showed no change. Heart, lung, liver, and gut participated in the increased water shift and liver also showed free cholesterol shift. Skin and gut participated markedly in the decreased total lipid, neutral fat, and total fatty acid shift and in addition gut showed a phospholipid shift. There were no other significant changes in lipid or water levels.

Further studies on lipotropism in the domestic duck (white Pekin). D. D. Duchesne and R. Bernard (Laval Univ., Quebec, and Quebec Zoological Garden, Charlesbourg, Quebec). *Can. J. Med. Sci.* **31**, No. 6, 474-484(1953). Various diets for ducklings were studied for their effects on liver lipids. On choline-free diets with various percentages of casein, casein plus 0.5% methionine, purified soybean protein, etc., it was found that methionine was lipotropic, casein was lipotropic, and that the purified soybean protein is a nonlipotropic protein for ducklings. High fat diets are less conducive to fatty livers than high carbohydrate diets. Inositol is lipotropic either in the presence or absence of cholesterol, but choline was much more effective under similar conditions. The two lipotropic factors have a synergistic action and the reduction of the liver lipids is primarily on the glyceride fraction. Cholesteryl ester was at its lowest value in the group fed the basal diet supplemented with inositol only. (*C. A.* **45**, 3044)

Phosphatase inactivation in HTST pasteurization of milk. S. A. Hansen, F. W. Wood, and H. R. Thornton (Univ. of Alberta, Edmonton, Canada). *Can. J. Tech.* **31**, 240-249(1953). Pasteurization of milk, ranging from 2.7-4.0% in fat content, by the commercial HTST (high-temperature short-time) method conforming to a legal minimum specification of 160°F. for a 15 sec. defined holding time will heat-treat milk considerably beyond the requirement for phosphatase inactivation.

Creaming impairment in HTST pasteurization of milk. S. A. Hansen, F. W. Wood, and H. R. Thornton (Univ. of Alberta, Edmonton, Alberta, Can.). *Can. J. Tech.* **31**, 250-255(1953). A study was made of the creaming impairment effects on milk of HTST (high-temperature short-time) pasteurization. The authors report that impairment was measurably less at 160°F. than at the present Canadian legal standard of 161°F., each with a respective holding time of 15 sec., and of serious commercial extent above this latter higher temperature. It is concluded that there appears to be no good reason for demanding a standard higher than 160°F. for 15 sec., when an adequate safety factor (against *M. tuberculosis*) is attained at this temperature.

Effect of three levels of fat intake on calcium metabolism. Mary E. Fuqua and Mary B. Patton (Ohio Agr. Exp. Station, Columbus). *J. Am. Dietetic Assoc.* **29**, 1010-13(1953). The effect of the three levels of fat (45, 91 and 135 gr/day) in isocaloric diets (2100 calories) on the calcium metabolism of nine college women was studied. Within the limits of this experiment the three levels of fat used had no significant effect on the calcium balance. The average calcium requirement for all subjects was approximately 630 mg. The order in which the three fat treatments were given had no significant effect on calcium retentions, and basal metabolic rates and calcium retentions were not significantly correlated.

A colorimetric method for the determination of vitamin A and carotene by perchloric acid. P. Flesch (Univ. Penna. School Med., Philadelphia). *Proc. Soc. Exp. Biol. Med.* **84**, 148-9 (1953). Vitamin A and carotene may be determined in each others presence due to the fact that a purple-red color is developed by vitamin A (max. 525-530 $m\mu$) and a bluish-green color is developed by carotene (max. 725-760 $m\mu$) in the presence of perchloric acid. These colors are stabilized in a solution of amyl acetate.

• Drying Oils

Raymond Paschke, Abstractor

Tung oil today. Anon. *Paint Oil Colour J.* **124**, 1138(1953). Economic survey.

Vinyltoluene—a new spoke in the vehicle wheel. Walter A. Henson (Dow Chemical Co., Midland, Michigan). *Am. Paint J.* **38**, No. 14, 59(1953). Discussion.

Vinyl emulsion polymers. C. E. Hollis and J. H. W. Turner. (British Resin Products, Ltd.). *Paint Oil Colour J.* **124**, 1313 (1953). Discussion.

Rosin derivatives in surface coatings. Part. I. Paraform modified rosin. N. R. Kamath and V. Krishnan (Dept. of Chem. Technology, Bombay). *Paintindia* 3, No. 7, 27(1953). The proportion of various resin acids of Indian gum rosin has been shown to be different from that reported for American gum Oleoresin from Pinus Palustris. The optimum conditions for preparing zinc hardened rosin containing the theoretical amount of combined zinc have been determined. Rosin esters of glycerol and polyglycerol, and also their paraform modified derivatives have been prepared. The modified resins have been evaluated for their performance in oil varnishes and lacquers.

The reaction between styrene and unsaturated fatty acids. Part II. S. Kut (Pearl Varnish Company, Ltd., Pontypridd, S. Wales, Britain). *Paint Varnish Production* 43, No. 12, 33 (1953). A method is described for separating free polystyrene from copolymer drying oil fatty acids and non-styrenated drying oil fatty acids. It is based on the precipitation of all the fatty acids as insoluble soaps from ethyl acetate, the polystyrene remaining in solution. The method is equally applicable to the separation of the unsaponifiable material from ordinary non-modified drying oils.

Crude pine gum—oleoresin. J. S. Laws (Gum Producers Assn., Boxley, Georgia). *Am. Paint J.* 38, No. 9, 68-76(1953). Historical review of the production of gum rosin and turpentine.

Castor oil as a raw material for chemical industries. T. V. Subba Rao and B. L. Rao (The Tata Oil Mills Co., Ltd., Bombay). *Paintindia* 3, No. 7, 32(1953). Review.

Quality control in the paint industry. Part II. L. Shatkin. *Paint Varnish Production* 43, No. 12, 31(1953). Acceptance and specifications for raw materials.

Latest developments in polyvinyl acetate emulsion paints. Walter E. Smith (Canadian Resins and Chemicals, Ltd., Montreal). *Can. Paint Varnish* 27, No. 11, 28(1953). Review.

Peroxides from autoxidized methyl oleate and linoleate as initiators in the preparation of butadiene-styrene synthetic rubber. D. Swern, *et al.* (U. S. Dept. Agriculture). *J. Polymer Science* 11, 487(1953). The fatty ester peroxides were compared with cumene and p-menthane hydroperoxides.

Some applications of statistical methods to exposure trials. Part I. Analysis of exposure data. H. R. Touchin (Beck, Holler, and Co., Ltd., Liverpool, England). *Oil and Colour Chemists' Assoc. J.* 36, 709 (1953).

Stand oil fractionation. F. T. Wallser, T. Mackay and K. B. Taylor (Michael Nairn & Company, Ltd., Kirckaldy, England). *Oil & Colour Chemists' Assoc. J.* 36, 667(1953). Fractionation techniques evolved to study the basic mechanism of thermal polymerization of drying oils can be applied to the technological evaluation of stand oils produced under different conditions. Two types of molecular distillation apparatus (a) a falling-film still, (b) a centrifugal cyclic still are described and their use in fractionating stand oils or methyl esters illustrated. Two versions of a novel liquid-liquid extractor are also shown, viz., a small-scale (100 g.) apparatus and a large-scale (1,000 g.) apparatus. The paper chromatography method used by Kaufmann in the examination of stand oils is critically reviewed. A series of stand oils of increasing viscosity have been fractionated by the above methods, and have been examined analytically and technologically. An air-blown stand oil (Bis oil) has been examined and compared with an uncatalyzed oil of similar viscosity. The importance of this work when applied to the manufacture of print paints for the linoleum industry is indicated.

Esters of titanium and their use in paint. Part I. Preparation of polymeric butyl titanates. G. Winter (Defence Research Lab., Melbourne, Australia). *Oil & Colour Chemists' Assoc. J.* 36, 689(1953). Polymeric butyl esters of titanium have been prepared by partial hydrolysis of the monomer with various amounts of butanol dissolved in water. The direct preparation of polymeric butyl titanate from titanium tetrachloride, butyl alcohol and water on a pilot plant scale is described. Yields of 80% were obtained. Hydrolysis is quantitative on addition of up to about 1.5 molequivalents of water. On further additions only a portion of the water added enters the reaction; a portion is adsorbed and some remains in the solvent. Molecular weights of some of the polymers were determined and ranged from 620 to 1400.

• Waxes

R. L. Broadhead, Abstractor

Wax encyclopedia. II. 8. Liquid systems. L. Ivanovsky. *Seifen-Ole-Fette-Wachse* 79, 401-2, 427-8(1953); cf. *C. A.* 47, 10250. A review of the behavior of wax solns. including retention. **II. 9. Supplement.** *Seifen-Ole-Fette-Wachse* 79, 428, 449-50. Systems contg. water are described and diagrams of solidification points of binary wax mixts. are given. (*C. A.* 47, 12844)

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Refining wax, especially beeswax. John J. Naugle, *U. S. 2,617,-815,* Nov. 11, 1952. Beeswax is mixed with 1-10% of an acid-treated alk. earth, e.g. montmorillonite contg. montronite and saponite, heated at 200-300°F., blown with steam or air at 10-25 lb./sq. in. for 40-60 min., and filtered. If the m.p. of the wax is to be stabilized as required in the manuf. of candles with controlled burning times, up to 1% of an alk. earth metal oxide, e.g. MgO, is added to saponify some of the lower esters. (*C. A.* 47, 11763)

Refining of wool fat. Herbert J. Passino and James M. Meyers (to M. W. Kellogg Co.). *U. S. 2,649,466,* Aug. 18, 1953. Wool fat is decolorized and refined by neutralization and solvent extn. with C_3H_8 in a tower by using a solvent-fat ratio of not less than 3:1, a top tower temp. of 270-320°F., a tower bottom temp. of 140-220°F., and a residence time of not less than 30 min. The decolorized product can be fractionated into wax and oil by auto-refrigeration of the C_3H_8 soln. and subsequent filtration of the pptd. wax. (*C. A.* 47, 11762)

Bleaching waxes, fats, and similar materials. Sandoz Ltd. *Swiss 285,144,* Dec. 16, 1952 (Cl. 38a). The following compds. are useful optical bleaching agents for fats and waxes in 0.001-0.002% concn.: 7-diethylamino-4-methylbenzo-a-pyrone (7-diethylamino-4-methylcoumarin), 7-dimethylamino-4-methylbenzo-a-pyrone, 7-ethylamino-4-methylbenzo-a-pyrone, 7-diethylamino-3,4-dimethylbenzo-a-pyrone, 7-methylamino-4-methylbenzo-a-pyrone, and 7-amino-4-methylbenzo-a-pyrone. In an example, 100 g. of tech. yellowish stearic acid was melted at 80° with 0.002% 7-diethylamino-4-methylbenzo-a-pyrone. The mixt. was cooled and the resulting product showed greatly enhanced whiteness (*C. A.* 47, 11763)

• Detergents

Lenore Petchaft, Abstractor

Fatty alcohols and fatty alcohol sulfates. D. Boido. *Internat. Perfumer* 3, 51-6(1553). Various processes for preparing fatty alcohols are reviewed including sodium reduction, high pressure catalytic hydrogenation, Oxo or Reppe process, Synol process and Oxyl process. The uses of these products in textile industry, washing products, cosmetics, fur and leather industries, paint and varnish, metal, agriculture, mining and oil industry are outlined. 34 references.

The surface viscosity of detergent solutions as a factor in foam stability. A. G. Brown, William C. Thuman and J. W. McBain (Stanford Research Institute, Stanford, Calif.). *J. Colloid Sci.* 8, 491-507(1953). A rotational viscometer, capable of providing rheological data for surface films on solutions of surface active agents, has been developed. Surface viscosity data have been obtained with a group of detergents and detergent mixtures specially selected to illustrate the role of surface viscosity in the stability of the foams obtained from the solutions by beating. Foams of highest stability appear to be produced from solutions showing appreciable surface viscosity; solutions yielding foams of very poor stability show very low surface viscosity.

Effect of electrolytes on the rate of surface tension lowering; the rate of surface equilibrium attainment as a factor in detergency. Emil J. Burcik (Penn. State College, State College, Penn.). *J. Colloid Sci.* 8, 520-8(1953). The effect of electrolytes on the initial time rate of surface tension lowering of anionic surface-active agents has been investigated. The increase in rate observed is largely determined by the charge of the added positive ion. In the case of cationic surface-active agents the increase in rate is largely determined by the charge of the added negative ion. An increase in temperature results in an increase in rate of surface tension lowering for sodium laurate. Detergent power and initial time rate of surface equilibrium attainment can, in most cases, be correlated where data are available if it is assumed that any variable which affects the rate of surface tension lowering at the solution-air interface will have the same effect at the interface between the solution and any second phase.

Correction of tastes and odors resulting from detergents. J. G. Filicky, C. W. Aman, and J. W. Hassler. *Taste and Odor Control J.* 19, No. 6, 1-8(1953). Detergents such as alkylaryl sulfonates (I), alkyl sulfates (II), alkyl sulfonates (III), and sulfonated amides (IV) produce tastes in potable water in minute concentrations of 0.6, 3.0, 1.4, and 2.5 p.p.m., respectively, and odors in minute concentrations of 0.7, 0.2, 0.3, and 2.0 p.p.m., respectively. The detergents were dissolved in odor-free water to a concentration of 5 p.p.m., and the effects of adsorption, disinfection, softening, and coagulation were studied. Threshold taste values were made at 20°, and odors were observed at 60°. The addition of HCl to pH 5.0 greatly intensified the taste and odor of III. Alum in concentrations of 5-50 p.p.m. gave the same results as HCl. The addition of bland lard increased the tastes and odors in II and III, slightly increased in IV, and decreased in I. The addition of 1 and 10 p.p.m. of Cl and ClO_2 after 16 hrs. contact and removal of free residual Cl intensified the tastes and odors of II, III, and IV. Active C (80 p.p.m.), such as Aqua Nuchar FAN, removed the tastes and 80% of the odors of all the detergents. Tastes and odors were absorbed more easily by C at pH range of 5-8 than at a higher pH level. Ferrisul had no effect. No consistent relation could be found which would make it possible to predict the behavior of different detergents when subjected to similar treatment. (*C. A.* **47**, 10156)

Continuous soap manufacture according to Mazzoni. The production of soaps under vacuum. Milos Fock. *Seifen-Ole-Fette-Wachse* **79**, 414-16(1953). A description of the process with diagram of an installation. (*C. A.* **47**, 10952)

Synthetic detergents and skin resistance. Geoffrey Hodgson (United Cardiff Hospitals, Cardiff, Eng.). *J. Detergents* No. 3, 8-16(1953). The functions and anatomical structure of the skin are described, together with the process of eczematous inflammation. Natural skin defense to damage includes its mechanical and physicochemical cell properties, the sebaceous secretion and sweat, and special defense against penetration. Constitutional factors weaken these. Domestic working and cleaning cause damage by breakdown in such defenses; synthetic detergents chiefly cause damage by penetration. The clinical effects of synthetic detergents are illustrated by clinical cases.

Comparison of effects of soaps and synthetic detergents on hands of housewives. Sture A. M. Johnson, Roy L. Kile, D. J. Kooyman, H. S. Whitehouse and J. S. Brod. *Arch. Derm. Syphilol.* **68**, 643-50(1953). A procedure for determining the relative condition of the skin of housewives' hands after using different detergents for regular household washing operations is described. It is based on gross and microscopic examination of the subjects' hands and lower arms before and after two weeks' use of the test products. Data are presented which are typical of those obtained in more than a dozen tests of this kind. Among the products for which test data are given, fine-fabric soap was associated with the best general skin condition of the hands. An all-purpose synthetic detergent and one all-purpose soap were found to be similar in this respect and next best, and both were somewhat better than a second all-purpose soap. In no case was the difference between products large. The incidence of dermatitis among the more than 5,000 housewives who participated in tests of this kind was about 1 in 1,000.

Physicochemical properties of surfactants. A. M. Mankowich Aberdeen Proving Ground, Md.). *Ind. Eng. Chem.* **45**, 2759-66 (1953). The numerical criteria of a group of factors consisting of surface tension, interfacial tension, contact angle, spreading coefficient, adhesion tension, and work of adhesion have been determined in order to develop a scientific and economical method of selecting surface active agents for specific detergent applications. Generalizations and specificities have been established for various types of surfactants and surfactant-builder combinations, using the related wetting and emulsification physicochemical factors. Limited correlation has been found between contact angle and surface tension and between contact angle and interfacial tension, the correlation being limited to a group of important surfactants, built and unbuilt.

The water loss of soaps in humid zones. G. B. Martinenghi and O. Romanus (inst. oleso, Rio de Janeiro). *Olearia* **6**, 217-23 (1952). Preliminary experiments on the spontaneous drying of soap cakes (settled, cold process, and filled soaps) show that drying takes place in two stages: a rapid stage lasts 8-13 days, and slow stage reaches equilibrium after 90 days from the start for pure soap and after 140 days for cold-process soap. At the end of the rapid stage the content of fatty acids is less than 72% for pure soaps; at equilibrium 74-82%. Lower values are characteristic for soaps containing glycerol and residual salts. (*C. A.* **47**, 12845)

Density of foam. Kyozo Nakashima. *Rept. Osaka Munic. Inst. Ind. Research* **4**, No. 2, 49-52(1952). The densities of foams prepared from aqueous solutions of saponin, gelatin, and soap (0.01-1.0%) were measured. As far as the surface tension of the solution is linearly proportional to the log of its bulk concentration, the foam density is also linearly proportional to the log of the bulk concentration or to the surface tension. In soap solutions, e.g. of Teepol and Na oleate, micelle formation has a marked effect on the foam density, i.e., below the critical concentration for micelles, the foam density decreased rapidly with the bulk concentration of the soap but above the critical concentration for micelles, the foam density was nearly independent of the bulk concentration of soap. (*C. A.* **47**, 10952)

Comparative cleaning of diphase and emulsion systems—measured by radioactive tracers. Lloyd Osipow, Gonzalo Segura, Jr., Cornelia T. Snell, and Foster Dee Snell (Foster D. Snell, Inc., New York). *Ind. Eng. Chem.* **45**, 2779-82(1953). Emulsion and diphase cleaners of identical composition were compared as to their ability to remove the individual components of a composite soil from steel surfaces. The diphase cleaner selectively removed fission products and palmitic acid, while other components of the soil were removed without preference. The emulsion cleaner removed palmitic acid preferentially, while carbon and barium carbonate were preferentially retained by the soiled panels. The diphase cleaner removed more soil in 1 minute than the emulsion cleaner removed in 5 minutes. The difference in behavior between the two detergent systems can be explained on the basis of wetting tendencies of the components of the systems and by the energy of activation required by desorption of surfactant anions from emulsified solvent droplets present in the emulsion cleaner.

Centrifugal separation of neat soap at the fitting stage. J. J. Vosganizantz (Savonneries Breton & Steinbach, Vitry-sur-Seine, France). *Soap, Perfumery, Cosmetics* **26**, 1017-21(1953). Actual soap plant operation using centrifugal separator is described with advantages and disadvantages indicated.

Some aspects of detergency and detergent testing. R. E. Wolfrom and A. C. Nuessle (Rohm and Haas Co., Philadelphia, Pa.). *Am. Dyestuff Reptr.* **42**, 753-62(1953). The multiplicity of factors involved in evaluation of detergents is emphasized. Difficulties involved in both scientific techniques and practical end-use tests are described. Three practical type tests are described, scouring raw wool stock, kier boiling method of scouring greige cotton, and removal of dry and oily soil by standard procedures.

PATENTS

Improvements in washing agents. Henkel & Cie, G.m.b.H. *Brit. 699,571.* A washing agent, not containing solvents, oxygen-yielding substances, soda or substances that are more alkaline than soda, and which does not cause fiber deterioration due to precipitation of hard water salts, consists of at least 60% soap and contains a minor content of colloidally soluble magnesium silicates which have a protective action.

Amide-glycamine condensation products. Anthony M. Schwartz (Commercial Solvents Corp.). *U. S. 2,653,932.* A new class of surface active agents possessing detergent and emulsifying properties is prepared by reacting the hydroxylalkylamide of a fatty acid and a glycamine or a N-monoalkylated glycamine.

Elimination of objectionable odors from soap. Frederick J. Squire and Peter D. Stengel (Lever Brothers Co.). *U. S. 2,660,-589.* The odor and color of hydrosulfite-treated water-soluble fatty acid soaps are improved by adding a water-soluble inorganic zinc compound such as zinc sulfate in an amount to take up sulfur-containing odor- and color-imparting residual hydrosulfite decomposition products by reaction therewith.

Glycerides and their derivatives. Paix & Cie. *Fr. 980,205,* May 9, 1951. Glycerol is treated with a fatty acid in the presence of 0.1-10% of a catalyst prepared from glycerol and H_2SO_4. Preferably a solvent, b. 80-220°, such as Et, Pr, and Bu acetates, EtOH, PrOH, and iso-PrOH, phenols, cresols, cyclohexanol, methyl- and dimethylcyclohexanols, aniline, and pyridine, may be present. These solvents may be mixed with benzene, toluene, xylenes, gasoline, or white spirit. The amount of solvent used is about 1-5 times the wt. of glycerol. Usually the ratio of glycerol to fatty acid is 1:1, but if the amount of glycerol is increased, polyglycerol esters result. The products which are detergents and surface-active agents may be sulfonated to give substances having similar properties. (*C. A.* **47**, 7798)

Bath and boudoir oils. S. L. Corvi. *Span. 195,552,* Mar. 5, 1951. A coloring agent in suspension, such as fluorscein, is added to any sulfonated oil, such as sulforicinoleate. To this preparation is added a sufficient amount of the essence of perfume desired. (*C. A.* **47**, 6100)