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

• Oils and Fats

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

Tests for monostearin. Victor Pedersen (Apotekerforeningens Kontrollab., Copenhagen). *Arch. Pharm. Chemi* **60**, 498-506 (1951). For determination of monostearin, oxidation with HIO_4 in a homogeneous solution gave best results. It is recommended to use 40 ml. trimethylcarbinol, 4 ml. H_2O, and 10 ml. periodate for each 0.15 g. monostearin at 47.5°. Decompose excess HIO_4 in $NaHCO_3$ solution by the addition of an excess of arsenite solution and KI and titrate excess arsenite with I_2. The change of color is to reddish violet rather than to blue. Determine free glycerol by a similar titration of an aq. solution of an ether solution of monostearin. The titration curve shows that 90% of the consumption of HIO_4 takes place in the first hr. and that the speed of oxidation thereafter decreases rapidly but not to a constant value. The curve indicates a consumption of HIO_4 at a constant speed in an oxidation period of from 3 to 24 hrs. This is caused by an oxidation of oxidation products of monostearin. A reaction period of 4 hrs. is recommended. The monoglyceride content is $A = (B/D)E \times 100/20{,}000$, in which A is percentage of monoglyceride, B is ml. 0.1 N HIO_4 consumed by 1 g. sample, D is ml. 0.1 N HIO_4 consumed by free glycerol in the sample, E is the mol. wt. of the monoglyceride, and 20,000 is the ml. 0.1 N NIO_4 used by 1 mol. monoglyceride. (*C. A.* **47**, 10177)

A comparison of the Schain butterfat test with the Babcock method. William H. Kanninen and Harry Lawrence (Foster D. Snell, Inc., New York, N. Y.). *Milk Dealer* **42**(9), 48-50, 86-8 (1953). The comparative precision of the two methods referred to the control method is of the order of 0.089% av. deviation for the Babcock test as compared to 0.056% for the Schain test. Numerous advantages for the Schain test are listed. (Cf. *C. A.* **47**, 10150)

Hydroxamic fatty acids and their significance in the analysis of fatty oils. V. Grinšteins. *Latvijas PSR Zinātnu Akad. Vēstis* **1949**, No. 2 (Whole No. 19), 65-80 (Russian summary). The hydroxamic fatty acids were prepared by treating linseed oil, hempseed oil, or the Me esters of the corresponding fatty acids with hydroxylamine hydrate in the presence of NaOEt. The hydroxamic fatty acids were fractionated by distribution between petroleum ether and a 1:1 alcohol-water mixture. The hydroxamic fatty acids with the lower iodine no. dissolved preferentially in the petroleum ether. A chromatographic separation of the intensively colored Fe complexes of these products was not possible because all adsorbents tried either decomposed the complexes or did not adsorb sufficiently. Similarly, chromatographic treatment of the acids themselves in an Al silicate column resulted only in a slight separation, as indicated by the I nos. of the effluents and sections; colored zones observed in these columns were caused by the side products present in the preparations. Fractional crystallizations of the hydroxamic fatty acids from petroleum ether or pentane at 0° permitted easy separation of the saturated hydroxamic acids and fractions with sharp m.ps. were obtained. Separation of nonsaturated hydroxamic acids would be very tedious. Many details are given. (*C. A.* **47**, 10247)

Indicator substances for the detection of hydrogenated oil when used as an adulterant of clarified butterfat. II. R. S. Dewan, A. R. S. Kartha, and K. C. Gulati (Indian Agr. Research Inst., New Delhi). *J. Sci. Ind. Research* (India) **12B**, 178-9(1953). Tyrosine Et ester can be used as a tracer in the detection of clarified butterfat (ghee) adulterated with hydrogenated oil (vanaspati). Heat 50 cc. of butterfat with 20 cc. of saturated NaCl solution on a waterbath for 45-60 min., filter, and reflux with 10 cc. of concentrated HCl for 30 min. Evaporate the acid solution to dryness, extract with 3.0-3.5 cc. of hot water, cool, and filter. To 2 cc. of filtrate add 0.2 cc. freshly diazotized solution of 0.25% 4-aminobiphenyl-HCl, shake, and make just alkaline to phenolphthalein (indicator external) with 5% Na_2CO_3 solution. Run a blank with pure butterfat. The color develops within 5 min., if tyrosine is present; no color appears in the blank within 10 min. The test is made more sensitive by adding 1 cc. of alcohol and 2 cc. of acetone, shaking, and settling 1-2 hrs. The supernatant liquid is yellow to red if tyrosine is present, and the blank is colorless. Ghee adulterated with 5% hydrogenated oil containing 0.005% of the tracer can be detected. (*C. A.* **47**, 10249)

Improvement in the preparation of edible oil from tobacco seeds. Steph. Vasiliades. Chim. Chronika (Athens, Greece) **16**(1/2), 1-4(1951). Ordinary tobaccoseed oil extracted by pressure or solvent has a bitter taste; it needs both refinement and hydrogenation to become edible. A multiple extraction of the seeds with hot water at 50° eliminates nicotine and other bitter substances so that an edible oil can be prepared by simple extraction of the resultant seeds. (*C. A.* **47**, 10249-50)

Reducing petroleum benzine losses in extraction plants. R. I. Spinov (Zaporozhskiĭ Oil-Fat Combine). *Masloboĭno Zhirovaya Prom.* **18**(5), 7-11(1953). Miscella processing equipment is described. It comprises a drum filter from which filtered miscella is conducted to an Ershov evaporator and the filter sludge is returned to the extraction apparatus. Special features are vents to remove filter sludge and vegetable-oil traps to absorb escaping gases. (*C. A.* **47**, 10247)

Rice-bran oil. Manuel Rodríguez Escribens and Francisco Freire R. (Escuela nacl. agr., La. Molina, Lima). *Agronomía* (Peru) **17**(70), 139-43(1952). Extraction of rice bran with Et_2O or gasoline or hot pressing (98°, 20,000 lb.) yielded an oil of d. 0.912-13, n^{26} 1.455, m. 31-6°, solidification point 25-6°, sapon. no. 186.2-187.6, acid no. (as oleic acid) 34.12-36.43, I no. (Hanus) 99.97, nonsaponifiable 4.21%, liquid acids 82.80%. The total acids contained palmitic 14.2, stearic 2.59, lignoceric 0.5, oleic 45.8, linoleic 36.2, linolenic 0.8%. The extracted bran contained ash 16.07, fiber 13.91, protein 14.07, and carbohydrates 55.95%. (*C. A.* **47**, 10249)

Research on sunflower oil produced in Turkish Thrace. Seniha Sargin (Tech. Univ. Istanbul). *Bull. Tech. Univ. Istanbul* **4**, 102-9(1951). The oil obtained from the seeds of the sunflower *(Helianthus annus)* cultivated in Turkish Thrace has a sp. gr. at 25° of 0.9166-0.9196; a viscosity at 25° of 27.2-33.8 stokes, an acid no. of 185.2-191.7, an I no. of 118.9-130.8. By oxidation this oil can be made suitable for lubricating purposes. Blowing air through the oil for 3 hrs. per day at 90° for 28 days increased the sp. gr. from 0.9189 to 0.9702, the viscosity from 36.9 stokes to 803 stokes, and the acid no. from 1.18 to 8.23. This oil loses its color upon oxidation instead of darkening like most of the other unsaturated oils. (*C. A.* **47**, 10249)

Determination of the Bellier index for vegetable oils. Its application to the determination of peanut oil in mixtures. Clementina Amato and Maria Elisa Wohlers de Almeida. *Rev. inst. Adolfo Lutz* **2**, 107-8(1952). In addition to data previously presented, the range and average temperature (Bellier index) for samples of vegetable oils were: sesame 19.2-20.4, 19.9; "pataua" 13.2-16.0, 14.7; soybean 19.4-20.0, 19.7; corn 20.9-26.6, 22.9; cashew nut 20.6-21.8, 21.2; grape seed 12.6 using the method of Silveira. The Bellier index was determined for mixtures of peanut oil with cottonseed, corn, sesame, and grapeseed oils. It can be used to estimate the percentage composition in a mixture of 2 known oils. The results obtained by the Silveira method are higher than those obtained by the AOAC method and lower than those obtained by the Lacerda method. (*C. A.* **47**, 10247)

Reprocessing of a hydrated sediment in decoction tanks. E. A. Aleksandrov, I. V. Golub, and L. Ya. Kulikov. *Masloboĭno Zhirovaya Prom.* **18**(5), 24-5(1953). A castor-oil mixture made of 58-60% decoction oil and 40-2% expressed oil is steam-heated to 90-5° and then treated with dry table salt at the rate of 1-1.5% of the wt. of oil. The mixture is stirred for 15-20 min. After settling for 2-3 hrs., the sediment underneath the oil is withdrawn, treated with extra salt to draw out more oil, and then transferred to a decoction tank to be used as a wetting agent for the pulp in place of water. It is claimed that this method of refining castor oil is more economical than the caustic soda refining and that it improves the yield and quality of oil. (*C. A.* **47**, 10247)

Low-temperature hydrogenation of fats in solvents over the skeletal type of nickel catalyst. D. V. Sokol'skiĭ and L. S. Melekhina. *Doklady Adad. Nauk S. S. S. R.* **89**, 881-3(1953). Cottonseed and linseed oil were hydrogenated with Raney Ni catalyst and in benzene, toluene, and xylene. At 10-80° the rate of hydrogenation in solvents is greater than that without solvents at the same temperatures, the solution in toluene being the most reactive, that in xylene least. In benzene the rate rises with temperature to 30° after which it begins to decline.

In toluene the rate rises with temperature up to 70°, after which it declines, the decline being possibly caused by H deficiency on the catalyst surface. At elevated temperatures there is more deterioration of catalyst activity with use. The rate is proportional to the amount of catalyst used. With larger amounts of catalyst and higher temperature the m.p. of the product after a given amount of H uptake declines, indicating greater hydrogenation selectivity. The activation energy is about 9000 cal./mole in the 30-50° range. The most rapid hydrogenation occurs at a 1-2:1 ratio of oil to solvent. (*C. A.* **47**, 10248)

A study of the fat-liquoring of leather. Hanuš T. Arend. *Tech. Hlídka Kozeluzská* **24**, 229-34(1949) (English summary). A review of the theoretical aspects of fat absorption by leather from emulsions including the functions and composition of the emulsion components and the factors influencing absorption. (*C. A.* **47**, 10260)

Fat-liquoring of chrome leather. I. I. Khokhlov. *Legkaya Prom.* **12**(4), 19-21(1952). The I no. of fish oil suitable for fat-liquoring chrome leather should not exceed 100-110. (*C. A.* **47**, 10260)

A proposal of uniform analytical methods for leather fats and greases. Ivan Binko. *Tech. Hlídka Kozeluzská* **24**, 289-90 (1949) (English summary). Methods for the determination of chemical composition and physical properties of leather fats and greases, mineral oils, soaps, egg yolks, degras, and sulfonated fats are proposed. (*C. A.* **47**, 10260)

Chemistry of the lipides. T. P. Hilditch (Univ. Liverpool, England). *Ann. Rev. Biochem.* **22**, 125-40(1953). A review of last year's work on glyceride composition of natural fats, biosynthesis of unsaturated acids in seed fats, some animal milk and depot fats, and miscellaneous fats and fatty acids. (*C. A.* **47**, 10027)

Rapid method for the determination of glycerol with periodic acid. I. G. Reznikov and E. L. Farber. *Masloboĭno Zhirovaya Prom.* **18**(5), 13-16(1953). The method is based on the formation of HCHO, HCO_2H, and HIO_3 by treating glycerol with KIO_4 and titrating the excess KIO_4 with $Na_2S_2O_3$ in the presence of H_3BO_3 or HCl. Dilute the sample containing about 0.4 g. of glycerol to 500 ml., take a 25-ml. aliquot, add 25 ml. of KIO_4 solution (7 g. of $Na_3H_2IO_6$ or 5.3 g. of KIO_4 dissolved in 100 ml. of 1.0 N H_2SO_4 and then diluted to 1000 ml.). Allow the solution to stand for 10 min., then add 20 ml. of 10% solution of KI, 20 ml. of 20% HCl, and 100 ml. of water. Titrate the liberated I with 0.1 or 0.5 N $Na_2S_2O_3$. There is no interference with EtOH in quantities likely to be present, and the analysis of sludge can be carried out directly. Good results were obtained in 12 experiments in the analysis of solutions containing 97.68-99.10% glycerol. The method is not recommended, however, for the analysis of petroleum asphalt. (*C. A.* **47**, 9863)

Determination of the degree of deodorization of fats. I. Kaganowicz. *Przemysl Chem.* **31**(8), 358-60(1952). The method for determining the degree of completion in commercial deodorization is based on the capacity of volatile material to reduce $KMnO_4$. (*C. A.* **47**, 10245)

Use of heat-exchanger for the cooling of hydrogenated fat. A. S. Panyshev. *Masloboĭno Zhirovaya Prom.* **18**(5), 25-6 (1953). The work describes the design and installation of a tubular heat-exchanger. (*C. A.* **47**, 10245)

Calculating the perturbation of the spectral background in complex cases: the case of polyenic fatty acids. Pierre May. *J. chim. phys.* **49**, 464-9(1952). A mathematical method is described for eliminating the effect of the background in the analysis of a mixture by means of ultraviolet absorption bands; it is successful even when the disturbing bands are very close to the ones being used. The method is applied to the determination of α- and β-eleostearic acids in biological mixtures. Linoleic, linolenic, and arachidonic acids can be determined in mixtures after isomerizing with KOH. (*C. A.* **47**, 10247)

Polarographic study of reduction of methyl oleate peroxide. Charles Paquot and Jacqueline Mercier. *Compt. rend.* **236**, 1802-4(1953). Methyl oleate peroxide obtained by bubbling O into methyl oleate in the dark at constant temperature (40°, 80°, and 110°), was analyzed polarographically in benzene in absolute MeOH, with LiCl as supporting electrolyte. Two waves resulted, a small one at —15 v and a large one at —0.9 v. In the oxidations at 40 and 80° the wave height was proportional to the concentration of the peroxide (determined volumetrically). (*C. A.* **47**, 9816)

New seed oil refining process. *Chem. Eng.* **60**(10), 356, 358 (1953). A description is given for a new process (Frankel, *U. S. 2,646,438*), for refining oils in solution. It is claimed to be especially suitable for use in solvent-extraction plants where miscella from the extractors could be refined prior to removal of the solvent.

Chemical nature of fatty acids of bacterial origin. Klaus Hofmann (Univ. of Pittsburgh, Pa.). *Record Chem. Progress* (Kresge-Hooker Sci. Lib.) **14**(1), 7-17(1953). *Lactobacillus arabinosus*, which requires biotin, accepts oleic, elaidic, and various more unsaturated acids instead of biotin. It does not utilize these acids in synthesizing biotin. Free lipides (directly soluble in acetone or ethyl ether) and bound lipides (soluble after acid hydrolysis) were recovered from cultures. Palmitic, stearic, and *cis*-11,12-octadecenoic acids were identified (the last had previously been observed only in horse-brain lipides). A nonadecenoic acid was also identified. It is given the name lactobacillic acid. *Lactobacillus casei* produces the same acid, but *Streptococcus hemolyticus* has a more conventional pattern of fatty acid synthesis: C_{12} and C_{14} in small amounts and C_{16} and C_{18} acids in much larger amounts, including palmitic, stearic, a hexadecenoic, and octadecenoic acid. Like sterculic acid (from *Sterculia foetida* kernels), lactobacillic acid has a three-carbon ring; its position on the chain is not known, but its presence indicates that a double bond is not essential to biotin-like activity in fatty acids. Analysis showed the fatty acid composition of bound lipides to be: palmitic 37, stearic 2, *cis*-11,12-octadecenoic 20, lactobacillic 31, unaccounted 10%, in *L. arabinosus;* in *L. casei*, 28, 5, 45, 19, 3% respectively. (*C. A.* **47**, 11346)

Polarometric determination of some unsaturated organic compounds. A. Blażed (Charles Univ., Prague). *Sborník Mezinárod. Polarog. Sjezdu Praze, 1st Congr.* **1951**, *Pt. III, Proc.*, 555-61 (in Czech.), 561-3 (in Russian), 563-5 (in English). Polarometric titrations were carried out in solutions of 0.5 M sodium acetate and 0.1 M ammonium acetate in glacial acetic acid with a solution of Br in glacial acetic acid as the titrating agent. Br is reduced to Br^- at the dropping Hg electrode but produces a maximum on the O wave which cannot be suppressed. Hence a rotating Pt electrode was used whereupon Br gave a limiting current, proportional to its concentration, before the production of O. A calomel or chloranil electrode served as reference electrode. The liquid junction potential at the interface of water and nonaqueous medium was reproducible. The polarometric titrations gave results in good agreement with potentiometric titrations and were used for determining the concentration and I nos. of 25 different unsaturated compounds. (*C. A.* **47**, 11078)

Physical-chemical studies on hydrogenated oils. I. Densities and refractive indices of hydrogenated olive oil. J. Oliver and I. Borrero (Univ. Sevilla). *Grasas y aceites* (Sevilla, Spain) 2(4), 7-18(1951). A sample of olive oil was hydrogenated at 180° from a Hanus I no. of 84 to a value of 24 with nickel formate as catalyst. The d.,*n*, and I nos. were determined at different stages of hydrogenation. The d. of olive oil, hydrogenated or unhydrogenated, in the temperature interval 10-100° varies linearly with temperature and can be calculated from the formula $d_t = a(1 - kt)$, where k is a constant and for the oils studied has the value of 6.77×10^{-4}, and the value of a depends on the degree of unsaturation. The d. increased with increasing unsaturation. The relation between the *n* and I no. was linear at constant temperature. Eykman's formula for calculating the specific refraction from the *n* and d gave values that agreed more closely with experimental determination than did the Lorenz-Lorentz formula. (*C. A.* **47**, 10933)

Chemistry of factice formation and related reactions. F. Kirchhof. *Kauschuk u. Gummi* **5**, 115-9(1952). In the course of the vulcanization reaction, the S_4 molecules are dissociated into single atoms, which associate with the free —C valences of the fatty acid chains and retain a free valency. The strong polymerizing tendencies of these free valencies are responsible for the formation of factice. (*C. A.* **47**, 11793)

Status of research on the flavor problem of soybean oil at the Northern Regional Research Laboratory. H. J. Dutton, C. D. Evans, and J. C. Cowan. *Trans. Am. Assoc. Cereal Chemists* **11**, 116-35(1953). A thorough review of recent work and a discussion of the present status of the problem.

Continuously operating a shaking filter for solid impurities (meal extract). V. P. Kichigin (Odesskii Oil Factory No. 2). *Masloboĭno-Zhirovaya Prom.* **18**(6), 26-7(1953). Meal extract is charged into a conical shaking filter near the bottom. Filtrate passes through the belting-cloth sides and sludge is drawn off at the bottom. (*C. A.* **47**, 11761).

Determination of the drop and solidification point of fatty acids and fats. Zdenek Hájek. *Chemie* (Prague) **8**, 204-6(1952). Polymorphism, moisture, and homogeneity in mixed fats are discussed with regard to effect on the solidification point. These factors must be considered to obtain reproducible drop and solidification points. (*C. A.* **47**, 11760)

Chemical study of Ucuhuba butter. Gerson Periera Pinto. *Bol. téc. inst. agron. norte* (Belem, Brazil) No. 23, 7-63(1951). Characteristics and composition are given. Ucuhuba butter can be used to produce trimyristin and myristic acid for the manufacture of soaps, candles, and shortening. (*C. A.* **47**, 11760)

An infrared study of the cis- and trans-isomers of some C_{18} fatty acids. N. H. E. Ahlers, R. A. Brett and N. G. McTaggart (Paint Research Station, Teddington, Middlesex). *J. Applied Chem.* **3**, 433-43(1953). Qualitative infrared spectra or liquid fatty acids were determined over the range 2.5 to 15.0 μ for thin films in cells of path length 25 μ. Solid acids were examined as solutions in carbon disulfide or carbon tetrachloride. For quantitative observations in 10 μ region, all samples were dissolved in carbon disulfide. Spectra are shown for 19 samples of acids: stearic, oleic, elaidic, ricinoleic, ricinelaidic, 9:12-linoleic (from tetrabromostearic acid and ricinoleic acid), 9:12-linolelaidic, 9:12:15-linolenic, 9:12:15-linolenelaidic, 9:11-linoleic (from ricinelaidic and ricinoleic acids), 10:12-linoleic (from ricinoleic acid, methyl linolelaidate and methyl linoleate), α-elaeostearic, β-elaeostearic, α-parinaric, and β-parinaric. Details of preparation of these acids, their melting points, refractive indices and extinction coefficients are included. All spectra show (a) broad band near 3.5 μ due to combined absorption of C-H valence of methylene and methyl groups together with unresolved contribution of associated OH valence vibrations of carboxyl groups; (b) single strong band at 5.84 μ due to acid groups; (c) maxima near 7.0 μ due to deformation vibrations of both methyl and methylene groups; (d) absorption near 8.0 μ caused by vibration of acid group and near 10.5 μ due to deformation vibration of COOH; (e) band near 14.0 μ caused by the hydrocarbon chain. Absorptions near 10 μ are characteristic of double bonds and can be used for the calculation of relative proportions of *cis-* and *trans-*structures.. The method is applicable to the analysis of isomeric mixtures such as result from the dehydration of castor oil or during the preparation of linseed stand oil.

Sorption of benzene by fatty acids. J. C. Arnell (Defence Research Chem. Labs., Canada). *J. Phys. Chem.* **57**, 641-5(1953). Sorption of benzene by even-numbered fatty acids from caprylic to stearic, inclusive, was measured by using a standard volumetric adsorption apparatus modified for working with benzene at temperatures in range 0 to 42°C. Results are tabulated and shown graphically. Isosteric heats of sorption were lated and shown graphically. Isostearic heats of sorption were calculated by means of the Clausius-Clapeyron equation. Results are discussed in terms of liquid solutions (caprylic acid in benzene), solid solutions (benzene in stearic acid), and transition systems (capric or lauric acid with benzene). Hysteresis loops were found with palmitic and stearic acids at low sorptions and low temperatures. In each case there appeared to be a maximum temperature above which hysteresis was not found. Observations are discussed in terms of normal crystal forces and partial melting points.

Preparation of mono-unsaturated fatty acids by partial hydrogenation of polyunsaturated fatty acid esters. C. Boelhouwer, Ong Tian Lie, and H. I. Waterman (Delft Institute of Technology). *Research Correspondence* **6**, 41S-42S(1953). Brief review and some new data showing that migration of double bonds during hydrogenation of fatty acids with nickel catalysts is strongly toward the carboxyl group.

Volatile oil in spices. N. Aubrey Carson (Food and Drug Admin.). *J. Assoc. Offic. Agr. Chemists* **36**, 752-7(1953). Report of collaborative work on the determination of volatile oils in star anise, nutmeg and allspice.

Vitamin A in mixed feeds. Maxwell L. Cooley (General Mills, Inc.). *J. Assoc. Offic. Agr. Chemists* **36**, 813-19(1953). Report of collaborative study of a chromatographic procedure for the determination of vitamin A in mixed feeds containing wheat bran, wheat middlings, corn gluten meal, ground yellow corn, soybean oil meal, dehydrated alfalfa meal, meat scraps, fish meal, and added vitamin A. Although the 1950 A.O.A.C. method was satisfactorily applied to feeds containing vitamin A which was stabilized by a matrix of vegetable wax, the method had to be modified when the matrix consisted of gelatin or pectin.

Research developments at the Northern Regional Research Laboratory. J. C. Cowan. *Soybean Digest* **14**, No. 1, 14-16(1953). Review of experiments with Gelsoy (a bread softener), edible spread from soybean oil, flavor stabilization of soybean oil, and the use of soy flour in bread.

Sorption of vapors by monolayers. VII. Effect of anesthetic vapors on some monolayers of biological interest. Robert B. Dean, Kenneth E. Hayes, and Roy G. Neville (University of Oregon). *J. Colloid Sci.* **8**, 377-84(1953). The effect of gaseous nitrous oxide and ethylene and the vapors of chloroform, divinyl ether and ether in oxygen on monolayers of fatty acids (stearic, pentadecanoic, oleic), cephalin, lecithin, cholesterol and ergosterol were determined. Monolayers were prepared on water in a covered trough and a stream of gas was passed over the surface. Nitrous oxide and ethylene had very slight effect, reducing the surface tension by at most 2 dynes/cm. The solvent vapors in oxygen behaved like hexanes on stearic acid and reduced the surface tension by 10-30 dynes at saturation. Chloroform increased the surface tension of all monolayers by 7-15 dynes/cm. and on a close-packed layer of stearic acid approximately a monolayer of chloroform was adsorbed at saturation. Ether is strongly adsorbed on water and it is not possible from the data to tell how much additional adsorption takes place on the monolayer. Divinyl ether has a smaller effect than diethyl ether.

Molecular cross sections in films of fatty acids on water. J. J. Kipling and A. D. Norris (University College, Hull, England). *J. Colloid Sci.* **8**, 547-51(1953). Letter to editor. A consideration of molecular models supports the suggestion of M. J. Vold that the lack of cylindrical symmetry in the paraffin chain must be taken into account in considering the packing of long chain fatty acids in monolayers on aqueous substrates. The molecular area (spacing) in the monolayer is greater than in crystals because of the vertical orientation of the chains in the monolayer.

Lipoids and lipoid P_2O_5 in noodles. V. E. Minsey (Food and Drug Admin.). *J. Assoc. Offic. Agr. Chemists* **36**, 761-6(1953). Report of collaborative comparison of methods for the estimation of lipoids, lipoid P_2O_5 and calculated egg contents in yolk noodles and whole egg noodles.

Carotene. F. W. Quackenbush (Purdue Univ. Agr. Exper. Station). *J. Assoc. Offic. Agr. Chemists* **36**, 857-60(1953). Report of a collaborative study of the determination of carotene in alfalfa meal.

Total solids and ether extract in fish. H. M. Risley (Food and Drug Admin.). *J. Assoc. Offic. Agr. Chemists* **36**, 607-8(1953). Report on a rapid method for the determination of ether extractables (fat) in canned salmon.

Paper chromatography of chloroplast pigments: sorption at a liquid-liquid interface. Harold H. Strain (Argonne National Lab.). *J. Phys. Chem.* **57**, 638-40(1953). Mixtures of chlorophylls and carotenoids from chloroplasts were separated by ascending chromatography on cellulose or glass paper. Diagrams are shown for separations obtained in the following systems: (1) paper, air-dried or moistened with glycerine; solvent, petroleum ether; (2) paper, like 1; solvent, petroleum ether with 0.5% propyl alcohol; (3) paper, sprayed with 80% methyl alcohol; solvent, petroleum ether; (4) paper impregnated with vaseline; solvent, 80% methyl alcohol. Development was complete in 20-40 min. Other systems are discussed briefly. The sorption of the pigments at these liquid-liquid interfaces is similar to the sorption on glass, cellulose or powdered sugar but unlike that on magnesia. No separation of α- and β-carotene or of lutein and zeaxanthin was achieved.

Vitamin A in margarine. J. B. Wilkie (Food and Drug Admin.). *J. Assoc. Offic. Agr. Chemists* **36**, 821-37(1953). Report on collaborative comparison of a blank oil method and a chromatographic procedure for the determination of vitamin A in margarine. The chromatographic method apparently gives more consistent results but requires further study.

The direct determination of phosphatidyl Ethanolamine and Phosphatidyl Serine in Plasma and Red Blood Cells. J. Axelrod, J. Reichenthal, and B. B. Brodie (National Institute of Health). *J. Biol. Chem.* **204**, 903(1953). Sensitive and specific methods for estimation of phosphatidyl ethanolamine and phosphatidyl serine in plasma and red cells have been described. The methods involve extraction of the phospholipides, their hydrolysis in alkali, and the formation of colored derivatives of ethanolamine and serine with dinitrofluorobenzene. These derivatives were separated by their differential solubilities in organic solvents and measured spectrophotometrically at 420 mμ. The specificity of the methods has been assayed by the counter-current distribution technique. Results of the application of the assay indicate that the major portion of the material in whole blood determined by the analytical procedures is phosphatidyl ethanolamine and phosphatidyl serine. There is no evidence for the presence of any phospholipides other than these two in the cephalin fraction of blood.

Anodic syntheses. Part IX. Unsaturated and hydroxy acids. A direct stereochemical connection of oleic and elaidic with erucic and brassidic acids. D. G. Bounds, R. P. Linstead, and B. C. L. Weedon. *J. Chem. Soc.*, 2393(1953). Undec-10-enoic, oleic, elaidic, and threo- and erythro-9:10-dihydroxystearic acids underwent the Kolbe reaction to give the expected products in 20-50% yields. Anodic cross-coupling of these acids with adipic half-ester occurred readily, and illustrated a convenient method for the synthesis of unsaturated long-chain fatty acids and their dihydroxy derivatives.

Mycomycin. IV. Stereoisomeric 3,5-diene fatty acid esters. W. D. Celmer and I. A. Solomons (Chas. Pfizer Co.). *J. Am. Chem. Soc.* **75**, 3430(1953). The synthesis of two stereoisomers of methyl 3,5-n-tridecadienoate, 3(trans), 5(cis) and 3(trans), 5(trans), through acetylenic intermediates was described. The synthesis was extended to the preparation of methyl 3(trans), 5(cis) and 3(trans), 5(trans)-n-nonadienoate. The 3-5-diene esters exhibited characteristic infrared absorption correlated with their stereochemical configuration. Two new examples of facile acetylene-allene isomerizations, noted in the course of this work, are discussed.

Cholesterol and companions. I. Partial dichromate oxidation to Δ^4-cholestene-6 beta-ol-3-one. L. F. Fieser (Harvard University). *J. Am. Chem. Soc.* **75**, 4377(1953). The oxidation of cholesterol with hexavalent chromium has been reinvestigated with the use of solutions of sodium dichromate in benzene-acetic acid at temperatures from 0 to 87°. Mauthner and Suida's "α-oxycholestenol," readily obtainable in 16.5% yield, has been characterized as Δ^4-cholestene-6 beta-ol-3-one by reduction with zinc and acetic acid to cholestenone, preparation by oxidation of Δ^4-cholestane-3 beta, 6 beta-diol, and isomerization to cholestane-3,6-dione.

Cholesterol and companions. II. Exhaustive dichromate oxidation. L. F. Fieser (Harvard University). *J. Am. Chem. Soc.* **75**, 4386(1953). Oxidation of cholesterol with excess dichromate at low temperature affords Δ^4-cholestene-3,6-dione as the chief product; exploratory experiments are reported on the reaction of this enedione with diazomethane, alkaline hydrogen peroxide and perphthalic acid.

Cholesterol and companions. III. Cholestanol, lathosterol and ketone 104. L. F. Fieser (Harvard University). *J. Am. Chem. Soc.* **75**, 4395(1953). A search for precursors of the two unidentified products of oxidation reported in paper I led instead to isolation of cholestanol, the new companion lathosterol, identified at Δ^7-cholestenol, and a substance $C_{27}H_{44}O_3$ temporarily designated ketone 104, which appeared to be an oxidation product of an as yet unknown companion.

Cholesterol and companions. IV. Oxidation of Δ^7-stenols with selenium doxide. L. F. Fieser and G. Ourisson (Harvard University). *J. Am. Chem. Soc.* **75**, 4404(1953). Oxidation of Δ^7-cholestenyl acetate with selenium dioxide in acetic acid-benzene at 0° afforded $\Delta^{8(14)}$-cholestene-3 beta, 7 α-diol diacetate. (II) The corresponding diol, obtained by deacetylation with lithium aluminum hydride, was reconvertible into II by acetylation and also gave a dibenzoate. The product obtained by Callow and Rosenheim by oxidation of 5-dihydroergosterol with selenium dioxide in ethanol has been characterized as an ethoxy compound and not an oxide as originally formulated, and the present evidence shows it to be 3 beta-hydroxy-7α-ethoxy-$\Delta^{8(14)22}$-ergostadiene. Selenium dioxide oxidation of 5-dihydroergosteryl acetate in acetic acid gives $\Delta^{8(14)22}$-ergostadiene-3 beta, 7 α-diol diacetate, which corresponded in M_D to the analogous product in the cholesterol series. All known facts regarding the oxidation of Δ^7-stenyl derivatives with selenium dioxide, peracids and chromic acid seem interpretable on the postulate of initial allylic hydroxylation at C_{14} and C_9.

Cholesterol and companions. V. Microdetermination of Δ^7-stenols. K. Nakanishi, B. K. Bhattacharyya and L. F. Fieser (Harvard University). *J. Am. Chem. Soc.* **75**, 4415(1953). The Δ^7-stenol content of a sterol preparation was determined with accuracy by a method based upon oxidation with selenium dioxide and spectrophotometric determination of iodine equivalent to the selenium formed.

Cholesterol and companions. VI. Lathosterol, cholestanetriol and ketone 104 from a variety of sources. L. F. Fieser and B. K. Bhattacharyya (Harvard University). *J. Am. Chem. Soc.* **75**, 4418(1953). Lathosterol has been isolated from gallstone cholesterol after fractionation of the acetic acid and oxalic acid complexes; cholestanol was isolated from the same source. Cholestane-3 beta, 5α, 6 beta-triol was isolated from the cholesterol of gallstones, egg yolk and human brain, in the last case under conditions precluding the possibility that the triol was an artifact. Ketone 104 ($C_{27}H_{44}O_3$) was obtained from purified cholesterol of ten different sources in yields of 44-136 mg./20 g.

Synthesis of erythro-and threo-α-amino-β-hydroxystearic acids. H. E. Carter, J. B. Harrison, and D. Shapiro (University of Illinois). *J. Am. Chem. Soc.* **75**, 4705(1953). The two DL-α-amino-beta-hydroxystearic acids have been synthesized and characterized as the threo and erythro forms on the basis of physical and chemical properties.

Determination of DDT and related substance in human fat. A. M. Mattson, J. T. Spillane, C. Baker, and G. W. Pearce (Public Health Service, Savannah, Ga.). *Anal. Chem.* **25**, 1065 (1953). Preliminary evidence of the occurrence of DDE as well as DDT in human fat made it necessary to study the Schechter-Haller method critically as applied to fat containing DDT and the degradation product DDE. Through empirical standardization it was possible to make differential determinations of DDT and DDE totaling 5 micrograms in unknown fat samples, with rough estimations down to 2 micrograms. A modified Davidow column was used in a rapid method for isolating DDT and DDE. Among 50 samples all but 2 contained substantial quantities of DDE. The total DDT plus DDE ranged from 0 to 80 ppm., with DDE representing from 39 to 86% of the total. Chromatographic and spectrophotometric data provided evidence that the degradation product is DDE.

Chromatostrips for identifying constituents of essential oils. J. M. Miller and J. G. Kirchner (U. S. Dept. of Agriculture, Pasadena, Calif.). *Anal. Chem.* **25**, 1107(1953). The components of essential oils cannot be positively identified by means of R_f values on chromatostrips, although many compounds can be eliminated by comparison of R_f values. Many reactions can be performed directly on the chromatostrip and the products chromatographed or the reaction can be carried out on a micro scale in a test tube and the reaction mixture chromatographed. These reactions include oxidation, reduction, dehydration, hydrolysis, and formation of derivatives. A list of R_f values, in a variety of solvents, of many terpenes and oxygenated terpenes found in essential oils is included.

Comparison of infrared absorption spectra of steroids obtained on solid films and mulls and in solutions. H. Rosenkrantz and L. Zablow (Worcester Foundation, Shrewsbury, Mass.). *Anal. Chem.* **25**, 1025(1953). The variability of infrared spectra obtained on the same steroid in different states has not previously been evaluated. Cross comparisons could be made among spectra obtained on steroids prepared as solid films, as mulls, or in carbon disulfide solutions when tendency for hydrogen bonding was not profound. Where hydrogen bonding occurred, significant absorption changes were observed between 9 and 10 microns. Despite these changes, the major portion of the fingerprint region (8 to 9, and 10 to 13 microns) suggested identity among the spectra. Hydrogen bonding occurred in solid films and mulls and no structural alteration was seen in melted films of steroids that had relatively low melting points and contained less than four oxygen atoms. Spectra may be compared to a significant extent irrespective of the preparative method employed. This could avoid unnecessary duplication of curves. Use of published curves could lead to identification of an unknown compound where no pure steroid is available for study in a manner identical to that used in studying the unknown.

Free fatty acid content of ice cream with certain observations on flavor relationship. T. C. Shotwell, W. J. Harper, and I. A. Gould (Ohio State University). *J. Dairy Science* **36**, 949 (1953). Studies were conducted on vanilla and chocolate ice cream mixes to establish the rancid flavor-free fatty acid threshold level. Results revealed that rancidity was detected in plain ice cream mix at an acid degree of approximately 4.0 to 4.5 and in chocolate ice cream mix at acid degrees between 5 and 6. These values are considerably higher than the threshold levels which have been reported for milk and cream.

Synthetic lubricants from hydroxystearic acids. H. M. Teeter, L. E. Gast, E. W. Bell, and J. C. Cowan (Northern Regional Laboratory). *Ind. Eng. Chem.* **45**, 1777(1953). The properties of several diesters of hydroxystearic acid indicated that they should be satisfactory lubricating fluids in many applications. Tests conducted at the Naval Research Laboratory indicated that 2-ethylhexyl 9(10)-propionoxystearate performed satisfactorily when submitted to dynamic oxidation tests at 100° and 150°C. Presumably the other related diesteres also would be satisfactory in this respect. However, none of the diesters studied has viscosity characteristics which would justify its use as a substitute for bis(2-ethylhexyl) sebacate.

Determination of oil in condensates. H. Hollaender. *Seifen-Ole-Fette-Wachse* **79**, 546(1953). A rapid method of analysis of oils in water condensates by fluorescence is described. The method has an accuracy of 0.02 mg. oil per liter of water.

Investigations on the fatty acids of pine wood and tall oil. P. Kajanne. *Annales Academial Scientiarum Fennical Series AII Chemica* **50**, 7-82(1953). The effects of saponification methods, autoxidation and sulfate cooking process in isomerizing the fatty acids of pine wood and tall oil were studied. A.O.C.S. and cold saponification methods both resulted in the formation of small amounts of conjugated dienoic ultraviolet absorption. The cold saponification method gave practically no trienoic absorption and its use is recommended. It was found that freshly prepared polyene acids could be stored under carbon dioxide at —12°C. or lower at least two weeks without changes in spectral characteristics. At room temperature a rapid change began after about two days. Storage of pine wood was shown to reduce the fatty and resin contents to a high degree. Autoxidation was found to result in the formation of conjugation in pine wood fatty acids. Heating at 180°C. liberated small amounts of highly conjugated fatty acids from the petroleum ether insoluble material of pine wood. One sample of pine wood fatty acids was investigated with respect to the geometrical configuration of its linoleic acid. The result suggested that the pine wood linoleic acid is of the normal cis-cis configuration. The conjugating effect of sulfate pulp cooking was investigated and it was found, from experimental cooking, that about 38% of the linoleic acid and over 50% of the linolenic acid present were altered. Comparative analyses of pine wood and tall oil fatty acids were carried out and a method of calculating the composition of tall oil suggested. A review of the literature concerning the extractives of *Pinus sylvestris* and tall oil is included.

Essential fatty acids in the cosmetics industry. H. Neumann. *Seifen-Ole-Fette Wachse* **79**, 551-552(1953). The uses of essential fatty acids in the cosmetics industry are discussed.

Sinitiro Kawamura, Abstractor

Preparation of dicarboxylic acids by the oxidative cleavage of unsaturated acids. Teruzô Asahara and Minoru Tomita (Univ. Tokyo). *J. Oil Chemists' Soc. Japan* **2**, 105-8(1953). Ricinoleic acid gave 58% sebacic acid together with 2-octanol by heating 8 hrs. at 270° with NaOH. However, oleic acid gave palmitic acid as the chief product by alk. oxidation. 9,10-dihydroxystearic acid gave 14% azelaic acid by alk. oxidation. The best method to prepare azelaic acid was the oxidation of 9,10-dihydroxystearic acid (rather than oleic acid) with concd. HNO_3. The yield was 61% in the presence of ammonium vanadate catalyst.

Advances of chemistry in the field of fatty acids (1941-51). Etsurô Maekawa. *J. Oil Chemists' Soc., Japan* **2**, 119-27, 157-64(1953). This is essentially annotated bibliography of 735 references.

The industries utilizing sperm oil in Japan. Kinjirô Inokuchi. *J. Oil Chemists' Soc., Japan* **2**, 99-104(1953). An address on the sperm whale, sperm oil, and its value as a source of higher alcohols, their sulfates, processing of higher alcohols with polyoxyethylene, by chloridation, and with chloromethyl ether—14 references.

The highly unsaturated acids in sardine oil. XV. The C_{16} and C_{18} acids in the ether-insoluble bromides and petroleum ether-insoluble bromides from the lower fraction of methyl esters of highly unsaturated acid concentrate. Yoshiyuki Toyama and Tsutomu Yamamoto. *J. Oil Chemists' Soc. Japan* **2**, 108-12 (1953). Dewaxed sardine oil subjected to the Na salts-acetone method gave a highly unsaturated acid concentrate (I no. 335.0) in a yield of 34%. The methyl esters were fractionated into 5 fractions by vacuum distillation. The first distillate (b.p. below 170° at 0.1 mm. Hg) was brominated in ether at —5°. Ether-insoluble bromides (I) were freed from ethanol-soluble substances, and ether-soluble bromides were treated with petroleum ether to separate petroleum ether-insoluble bromides (II). The fatty acids of debrominated I were examined by fractional distillation of methyl esters, fractionation of bromides by hot and cold benzene, and fractional precipitation of Na salts in acetone. From I were separated the following acids: hiragoic acid (6, 10, 14-hexadecatrienoic acid) and a hexadecatetraenoic acid; an octadecatrienoic acid and moroctic acid (4,8,12,15-octadecatetraenoic acid). The existence of octadecapentaenoic acid was not confirmed, but could not be denied. As the highly unsaturated acids from II, hiragoic acid and an octadecatrienoic acid were separated. By the Hazura method hiragoic acid was oxidized to hexahydroxypalmitic acid, and the octadecatrienoic acid was oxidized to hexahydroxystearic acid. The octabromides from hexadecatetraenoic acid and moroctic acid were found to be somewhat soluble in hot benzene.

XVI. The structure of hexadecatetraenoic and octadecatrienoic acids. Yoshiyuki Toyama and Tsutomu Yamamoto. *J. Oil Chemists' Soc. Japan* **2**, 147-9(1953). The $KMnO_4$ oxidation of the K salt of hexadecatetraenoic acid (I) in aq. solution and of butyl ester of I in acetone solution produced succinic acid and possibly acetic and malonic acids and no formic acid. It is very probable that I is 4,8,11,14-hexadecatetraenoic acid. The $KMnO_4$ oxidation of the ethyl ester of octadecatrienoic acid (II) in acetone solution produced adipic, succinic, and butyric acids. Thus it is concluded that II is 6,10,14-octadecatrienoic acid.

XVII. Re-examination of the structure of eicosatetraenoic acid. Yoshiyuki Toyama and Tsutomu Yamamoto. *J. Oil Chemists' Soc. Japan* **2**, 193-4(1953). Eicosatetraenoic acid was prepared from the highest boiling distillate of methyl esters of highly unsaturated acid concentrate from dewaxed sardine oil. The $KMnO_4$ oxidation of the ethyl ester of this acid gave rise to butyric acid, succinic acid, and monoethyl succinate. Thus it was reaffirmed to be 4,8,12,16-eicosatetraenoic acid as reporetd earlier (1935).

XVIII. Ultraviolet absorption measurements of alkali-isomerized highly unsaturated acids. Yoshiyuki Toyama and Tsutomu Yamamoto. *J. Oil Chemists' Soc. Japan* **2**, 195-8(1953). Before isomerization the specific extinction coeffs. for wave lengths of 233, 268, 316, and 346 mμ were respectively for hiragoic acid, 3.32, 0.90, ..., ...; moroctic acid, 3.55, 1.01, 0.16, ...; eicosatetraenoic acid, 5.28, 2.95, 0.53, ...; eicosapentaenoic acid, 7.08, 3.53, 0.48, 0.15; and clupanodonic acid, 6.53, 4.07, 0.48, 0.10. These acids were all prepared from sardine oil. When isomerized with KOH-glycerol or KOH-glycol, conjugation occurred more as the concentration of KOH increased. The conditions of isomerization proposed by Herb *et al.* (*J. Am. Oil Chemists' Soc.* **28**, 505 [1951]; **29**, 456 [1952]), 21% KOH-glycol, 180°, 15 min., were suitable also for highly unsaturated acids. In the fatty acids with equal no. of ethylenic bonds the isomerization under the same conditions tended to give more conjugation in the fatty acids with smaller no. of C. There seemed to exist differences in ease of conjugation according to the relative position of nonconjugated ethylenic bonds.

The odor of cuttle-fish liver oil. I. Identification of volatile acids and bases. Yatarô Obata and Kagenori Matano. *J. Oil Chemists' Soc. Japan* **2**, 112-14(1953). Liver oil of *Ommastrephes sloani pacificus* was put to steam distillation and the odorous distillate was separated by further distillation *in vacuo* and extraction with ether. The ether-soluble fraction with specific odor of cuttle-fish liver oil contained formic, acetic, propionic, butyric, valeric, caproic, pelargonic, palmitic, and phenylacetic acids as revealed by paper chromatography. The ether-insoluble fraction with ammoniacal and fish odors contained 12 free amines (isolated as picrolonates), among which ammonia, methylamine, dimethylamine, trimethylamine, ethylamine, and piperidine were detected.

Apparatus for preventing the rice oil from the increase in acid number during storage. Yoshio Tsujino and Kenji Kitaichi. *J. Oil Chemists' Soc. Japan* **2**, 139-43(1953). The increase in acid no. of rice oil during storage of rice bran could be prevented by heating rice bran at 120° for 5-10 min. A suitable apparatus was devised and is illustrated.

Cuttle-fish and mackerel oils. Minoru Yamada, Hideko Takai, Masateru Mizuta, and Yoshiyuki Toyama. *J. Oil Chemists' Soc. Japan* **2**, 149-52(1953). The liver oil of cuttle-fish *(Ommastrephes sloani pacificus)* (26 samples) had (av. values) d^{20} 0.9261, n^{20} 1.4823, acid no. 12.4, sapon. no. 184.8, I no. 189.1, unsapon. 4.03%, ether-insoluble bromides-forming fatty acids 73.93%, saturated acids in mixed acids 25-27%, trisaturated glycerides 1-2%, and $E^{1\%}_{1cm.}$ 328 mμ 0.418-0.585. The mackerel *(Scomber japonicus)* oil (16 samples) had d^{20} 0.9213, n^{20} 1.4778, acid no. 8.79, sapon. no. 191.8, I no. 152.3, unsapon. 1.23%, ether-insoluble bromides-forming fatty acids 47.92%, saturated acids in mixed acids 22-25%, trisaturated glycerides 1-3%, and $E^{1\%}_{1cm.}$ 328 mμ 0.144-0.328.

The oils extracted with ether from the cuttle-fish liver of low oil content and from the residue of cuttle-fish oil rendering. Yoshiyuki Toyama, Hideko Takai, and Minoru Yamada. *J. Oil Chemists' Soc. Japan* **2**, 152-4(1953). The oil extracted with ether from the cuttle-fish of low oil content had d 0.8826-

0.8969, sapon. no. 130.3-155.4, I no. 155.5-206.4, unsapon. 9.64-48.30%, and ether-insoluble bromides-forming fatty acids 72.74-85.67%. Thus the unsaponifiable matter content was much higher than the ordinary cuttle-fish liver oil prepared commercially by boiling. This was interpreted partly due to the incomplete solubilizing of unsapon. matter by boiling. Oil by boiling contained 3.30-4.48% unsapon., while the oil extracted with ether from the residue of cuttle-fish oil by boiling contained 8.84-10.59%.

PATENTS

Process for preparing hard butter from hydrogenated coconut oil and similar oils. John E. Blum (The Glidden Co.). *U. S. 2,657,995.* Hard butter is prepared from the product obtained by vacuum distillation and hydrogenation of coconut oil until it is practically free from unsaturated fatty acid glycerides and has a saponification equivalent between 229 and 241.

Refining fatty oils. George H. Palmer (The M. W. Kellogg Co.). *U. S. 2,658,907.* Process for fractionation of fatty oils by countercurrent extraction with a low boiling solvent having a critical temperature not substantially higher than 450°F.

Treatment of resin acid - fatty acid mixtures. Owen S. Eckhardt, Don F. Cook, and Ismond E. Knapp (Leach Brothers, Inc.). *U. S. 2,659,718.* Crystallization of resin acids in mixtures of resin acids and higher molecular weight fatty acids derived from tall oil is inhibited by reacting the mixture with a low molecular weight aliphatic alcohol to etserify a major portion of the fatty acids and then reacting the resultant mixture with 4-12% formaldehyde (based on the weight of resin acids).

Fractionation of fatty materials. John T. Dickinson (The M. W. Kellogg Co.). *U. S. 2,660,590.* The process involves extraction of fatty material with a solvent having a critical temperature not substantially higher than 450°F. The fatty material is contacted with solvent-oil mixture at a temperature near the critical temperature and under liquefying pressure. The extract phase is withdrawn and the ratio of pressure to temperature is reduced without substantial vaporization of the solvent until there is separation of a solvent-rich liquid phase and an oil-rich liquid phase containing the desired extract. The solvent-rich phase is recycled.

Separation of fatty acids from hydrocarbon solutions. Norman L. Dickinson (The M. W. Kellogg Co.). *U. S. 2,660,601.* Fatty acids are synthesized from hydrocarbon waxes having molecular carbon contents in the range of 16-30 by contacting the molten wax countercurrently with an oxidizing gas in the presence of a catalyst. Fatty acids are separated from the effluent by countercurrent extraction under pressure with a solvent having a critical temperature not above about 450°F.

Buttermaking. A. I. Zheltakov. *U. S. S. R. 77,182,* Dec. 31, 1949. Rich cream with a fat content of not less than 70% is kept at 15°. To it is added the required amount of butterfat at 35°. The mixture is heated to 26° and passed through a centrifuge. (*C. A.* **47,** 10150)

Determination of the air content in margarine, shortening, etc. S. S. Deryabin. *U. S. S. R. 77,780,* Dec. 31, 1949. The sample to be tested is placed in a vacuum vessel, covered with a vegetable oil, and heated for 2-3 min. to a temperature, 5-10° higher than the melting point of the sample. (*C. A.* **47,** 10150)

• Biology and Nutrition

F. A. Kummerow, Abstractor

Chemical and pharmacological investigations of seeds of Daucus carota. S. L. Agarwal, P. C. Dandiya, and V. N. Sharma (Med. Coll. Jaipur). *Indian Pharmacist* **8,** 291-6(1953). Carrot seeds were extracted with Et_2O to yield a dark brown oil and a residue from which was obtained an extract that depressed respiration and relaxed smooth muscles in anesthetized dogs. (Cf. *C. A.* **47,** 10178)

Fat metabolism in the liver as influenced by ethyl and methyl alcohol in animal experiments. W. Eger and O. Zündorf (Univ. Göttingen, Germany). *Med. Monatsschr.* **7,** 420-6(1953). The livers of rats 8 hrs. after administration of EtOH show an accumulation of fat. The fat decreases after MeOH. Both processes are reflected by a typical histological change. Guinea pigs 8 hrs. after EtOH feeding show no increase in liver fat, but the increase is marked after MeOH. The fat in the rat liver becomes visible at a content of 10 to 12% in the dry material. After alcohol feeding this threshold is increased to 16%. Guinea pigs show no increase in this threshold. The fat equilibrium of the liver expressed by this threshold is an expression of a constant liver function; it is influenced by starvation and, as shown, by alcohols. (*C. A.* **47,** 10120)

A comparative study of the lipide composition of the brain in various vertebrate classes. R. Bieth and P. Mandel (Univ. Strasbourg, France). *Experientia* **9,** 185-6(1953) (in French). Analyses of total lipides, phosphatidic fatty acids, and sphingomyelin of the brains of carp, turtle, duck, domestic fowl, rat, guinea pig, cat, dog, and man show an increase in the ratio of these to the species' characteristic quantities of deoxyribonucleic acid of the diploid chromosome group; this increase is regarded as parallel to phylogenetic position. (*C. A.* **47,** 10081)

Distribution of vitamin A in the livers of sheep. Enrique Pierangeli and Juan Carlos Radice. *Rev. asoc. argentina dietol.* **9,** 161-5(1952). Normal sheep liver and liver rejected because of pathological nodules contained the same amounts of fat and of vitamin A. Congestive liver contained small amounts and pigmented liver contained very small amounts of fat and vitamin A in isolated drops.

Nutritional deficiencies in mice caused by stress agents. David K. Bosshardt and Jesse W. Huff (Sharpe & Dohme, Inc., West Point, Pa.). *J. Nutrition* **50,** 117-27(1953). The addition to a complete low-fat diet of such metabolic stresses as are brought about by the intestinal bacteriostatic agents, succinylsulfathiazole, streptomycin, or atebrin, or such materials as thyroid or triacetin, causes a retardation of growth in mice. This growth retardation can be prevented if fat, fatty acids, or such low-fat materials as a partially defatted cottonseed meal or an H_2O-extracted liver residue are added to the stress-containing basal diet. (*C. A.* **47,** 10074)

Histochemistry of lipides. II. The structure of lipochromes. C. Ciaccio (Univ. Messina, Italy). *Boll. soc. ital. biol. sper.* **27,** 27, 874-6(1951). Many tissues were examined by special staining methods. Reactions with $AgNO_3$-NH_3 solution (a) and periodic acid (b) are indicative of 1,2-glycols, keto-enolic compounds and an amino alcohols. Autoxidation of unsaturated lipides seems to involve peroxide formation, transposition, and polymerization, due to CHOHCO groups. The autoxidation products of unsaturated lipides give the same reactions as cellular lipochromes. (*C. A.* **47,** 10018)

Action of saturated and unsaturated fatty acids on deoxyribopolynucleotidase (DRP). C. Lenti and S Di Bella. *Boll. soc. ital. biol. sper.* **27,** 357-9(1951). Saturated fatty acids from C_1 to C_6 in concentrations of 0.005M have no inhibiting action on DRP. Lauric and myristic acids produce complete inhibition and palmitic, stearic, oleic, and ricinoleic acids progressively effect a gradually diminishing inhibition which is discernible even at a concentration of 0.001M. (*C. A.* **47,** 10017)

Food and the future. (4b) Synthetic potentialities: synthetic fats. P. N. Williams (Research Dept., Unilever, Ltd., Port Sunlight, Cheshire, Eng.). Synthetic fats for edible use were made in Witten, Germany, during World War II, by oxidation of hydrocarbons (320-450° cut from Fischer-Tropsch process), separation of the fatty acids and esterification of the latter with glycerol. These fats possessed the following properties: sapon. value 227; % FFA 0; I no. 15.5; m.p. 34.3; unsaponifiable 4.0%; hydroxyl value 15.9%; flavor, unpleasant. These fats contain approx. equal amounts (8-12%) of each acid (including odd-numbered ones) from C_{11} to C_{20}. The suitability of these fats for human consumption has been questioned because of the presence of acids having odd numbers of carbons, branched chain acids and materials which, when consumed, lead to excretion of dibasic acids in the urine.

Effect of diet and temperature on the distribution of fats in the rat. Louise Marie Babineau and Édouard Pagé (Laval Univ., Quebec, Can.). *Ann. ACFAS* **17,** 102-7(1951). Rats were fed identical diets except that one contained 35% fat and the other 5%. Some of the animals were kept at 0-3°. Growth under both conditions was greater with the high-fat diet. The high-fat diet favored accumulation of lipides in rats at ordinary temperatures but not at low temperatures. At normal temperatures the high-fat diet resulted in increased visceral lipides, decreased carcass lipides, and unchanged subcutaneous lipides relative to the low-fat diet, which effects were insignificant in animals at low temperatures. Animals grown at low temperatures increased the reserves of fat but not to the same extent as animals at ordinary temperatures. (*C. A.* **47,** 11401)

Relation of choline oxidase activity to dietary fatty livers. Fred L. Humoller and H. J. Zimmerman (Veterans Hosp., Omaha, Neb.). *Am. J. Physiol.* **174,** 199-202(1953). The liver choline esterase activity of rats fed a diet high in fat but low in choline content is greatly decreased. This decrease in activity is quite precipitous during the first week of this diet but seems to approach a relatively constant value if the animals are kept on this diet for longer periods of time. The liver fat content of these animals rose rapidly and continued to rise for the duration of the experiment (3 weeks). Fatty acids in sufficiently high concentration greatly inhibit choline oxidase of normal liver homogenate but they also inhibit to the same degree homogenates prepared from dietary fatty livers. Injection of choline and betaine 2 hours before killing the animals with dietary fatty livers has no effect on the choline oxidase activity of homogenates prepared from these livers, nor does it increase the endogenous O uptake of the homogenates. (*C. A.* **47**, 11400)

Effect of dietary fat and cholesterol on the blood cholesterol level in rats. Leon Swell and D. F. Flick (Veterans Admin. Center, Martinsburg, West Va.). *Am. J. Physiol.* **174**, 51-3 (1953). Rats were fed diets with and without cholesterol containing 25% lard, oleic acid, or stearic acid. The blood cholesterol rose sharply in both groups on the lard diets. The change occurred predominantly in the ester fraction. When oleic acid was added to the diets, the total and ester cholesterol of both groups declined slightly. On the stearic acid diets the total and ester cholesterol of both groups declined, but more sharply in the cholesterol group. Incomplete absorption of cholesterol may take place when a high percentage of saturated fatty acids is present in the diet. (*C. A.* **47**, 11400)

Lipolytic activity of liver tissue of rats on a diet deficient in essential fatty acids. Osman Saka and Ümran Sipahioglu (Univ. Istanbul, Turkey). *Am. J. Physiol.* **174**, 49-50 (1953). The lipolytic activity of the liver tissue of rats on a diet deficient in unsaturated fatty acids was studied. The lipolytic activity of the liver depends on the content of unsaturated fatty acids was studied. The lipolytic activity of the liver depends on the content of unsaturated fatty acids in the diet. The action of arachidonic acid is more effective than the other unsaturated fatty acids, such as linoleic and linolenic acids in reëestablishing the hepatic lipase. (*C. A.* **47**, 11400)

Response to lipotropic agents. II. Serum phospholipide-cholesterol ratios in coronary atherosclerosis. Lester M. Morrison, M. Stevens, E. Wolfson, and P. Gonzales (Coll. of Med. Evangelists, Los Angeles, Calif.). *Angiology* **4**, 130-3 (1953). A series of 28 patients with coronary thrombosis and infarction were tested by a 23-g. low-fat low-cholesterol daily dietary together with combinations of lipotropic agents for 6 months. The lipotropic combination consisted of 3 g. choline, 2 g. of inositol, 4 g. of methionine, and natural B complex obtained from 12 g. of liver, administered orally every day for 6 months. Serum phospholipide/cholesterol ratios were determined before and after treatment with diet and lipotropic agents. By reducing the exogenous dietary fat and cholesterol intake, serum cholesterol levels were reduced. By increasing the exogenous source of phospholipides through the ingestion of adequate amounts of lipotropic substances, serum phospholipides were elevated. In this series of 28 patients with coronary atherosclerosis, subnormal serum phospholipide/cholesterol ratios below 1.0 were restored to normal levels above 1.0 by the method of treatment described. (*C. A.* **47**, 11399)

The intravenous administration of a combined fat emulsion into surgical patients. B. G. P. Shafiroff (New York Univ., New York, N. Y.). *Surg. Gynecol. Obstet.* **89**, 398-404 (1949). Additional data are given on the intravenous nutrition of 22 patients with an emulsion containing 10% fat, 5% glucose, and 5% protein hydrolyzate. Toxic reactions were slight. (*C. A.* **47**, 11398)

Influence of some dietary factors on the mortality of mice due to x-rays. R. Pris and J. Vavasseur (Fac. pharm., Paris). *Thérapie* **8**, 57-61 (1953). The basal diet of mice (20 g.) consisted of wheat flour 90, yeast 2.5, cod-liver oil 1.0, NaCl 1.5, and Ca lactate 5 g., with some milk and carrots. Average survival after irradiation with 600 r. was 212 hours. Vitamins A, D, E, B_1, B_6, and niacin were without effect. High doses of cod-liver oil and wheat-germ oil shortened the survival. (*C. A.* **47**, 11390)

Factors influencing the formation of ceroid in the livers of choline-deficient rats. I. Dietary fats. W. G. Bruce Casselman (Univ. Toronto, Can.). *Biochem. et Biophys. Acta* **11**, 445-6 (1953). The effect of the degree of unsaturation of the dietary fat on the amount of ceroid formed in the livers of choline-deficient rats was determined. Rats fed choline-deficient diets containing, as fat source, methyl linoleate, hydrogenated cottonseed oils (I no. 12 or 36), cocoa butter (I no. 36), beef tallow (I no. 40), cottonseed oil (I no. 111), or a mixture of 4 parts cod-liver oil (I no. 151) and 6 parts corn oil (I no. 125). The amount of hepatic ceroic formed was greater in those rats fed cottonseed oil or the cod-liver oil-corn oil mixture than in the other rats.

II. Dietary antioxidants. *Ibid.* 446-7. The addition of methylene blue or α-tocopherol to a choline-, vitamin E-deficient diet inhibited the formation of ceroid in the livers of the rats on the diet. (*C. A.* **47**, 11389)

Effects of a transient vitamin A deficiency on survival following x-irradiation. B. H. Ershoff and S. M. Greenberg (Emory W. Thurston Labs., Los Angeles, Calif.). *Exptl. Med. Surg.* **11**, 46-8 (1953). A transient deficiency of vitamin A, apparently corrected by the administration of relatively high doses of vitamin A natural esters from soupfin shark-liver oil, significantly reduced the survival time of rats after a single lethal dose of total body x-irradiation. (*C. A.* **47**, 11389)

The action of phospholipides and oxypolymerized vegetable oil on the nutritive value of sunflower oil. N. C. Bukhman and K. M. Levkovich (Sci. Research Sanita.-Hyg. Inst., Leningrad). *Voposy Pitaniya* **123**, 49-54 (1953). The nutritive value of raw sunflower oil (containing 0.7% phosphatides as lecithin), of pure, refined sunflower oil, and of refined oil containing 0.7% oxypolymerized oil was studied in 3 groups of rats fed for 3 months each. The group fed raw sunflower oil grew better and in case of hunger they made more economical use of their fat deposits, utilized their protein, and lived longer. The presence of phosphatides is of enormous value. Phosphatides help in the proportional depositing of the lipides in the fat depots and the absorption and oxidation of the fats. In refining, oil loses the phosphatides. (*C. A.* **47**, 11381)

Dietary modifications of plasma cholesterol and phospholipide levels in diabetic patients. The effect of mixed diets high in vegetable fat. Gilbert C. Cochrane, George D. Michaelis, and Lawrence W. Kinsell. *J. Clin. Nutrition* **1**, 295-8 (1953). The substitution of vegetable fat for animal fat in diabetic diets high in protein and fat resulted in a major fall in levels of plasma cholesterol and phospholipides in diabetic patients. (*C. A.* **47**, 11380)

The metabolism of sorbitan monostearate. Arne N. Wick and Lionel Joseph (Scripps Metabolic Clinic, La Jolla, Calif.). *Food Research* **18**, 79-84 (1953). Radioactive sorbitan monostearate was fed to rats and the fate of the C^{14} determined. The distribution of C^{14} shows that at least 90% of the polyol-labeled emulsifier, when fed in oil solution, was hydrolyzed to stearic acid and the anhydrides of sorbitol. When fed as an aqueous emulsion about 50% of the ester was hydrolyzed. The anhydrides of sorbitol which were liberated by the hydrolysis were largely excreted into the urine before they could be completely oxidized to CO_2. The amount of C^{14} found in the tissues 48 hours after feeding of polyol-labeled sorbitan monostearate in oil was 5 to 7% of the administered C^{14}. Fractionation of the crude fat extract of the tissues (excluding the intestinal tract) showed that less than 0.1% of the fed C^{14} may represent sorbitans derived from fed sorbitan monostearate or sorbitan esters synthesized from circulating sorbitan. (*C. A.* **47**, 11379)

The use of ferrous sulfate to inactivate gossypol in diets of laying hens. J. L. Fletcher, B. F. Barrentine, L. J. Dreesen, J. E. Hill, and C. B. Sjawver (College Station, Mississippi). *Poultry Sci.* **32**, 740-2 (1953). Eggs produced by hens on cottonseed-meal diets containing 0.03% free gossypol with and without 0.5% $FeSO_4$ indicated that this level of $FeSO_4$ largely prevented discoloration in storage. Although $FeSO_4$ appeared to inactivate free gossypol in laying diets, a possible adverse effect on production occurred. (*C. A.* **47**, 11376-7)

Palatability of turkeys fed experimental diets containing aureomycin and fish products. May T. Swickard, Alice M. Harkin, and Stanley J. Marsden (Bur. of Human Nutrition & Home Economics, Washington 25, D. C.). *Poultry Sci.* **32**, 726-9 (1953). The addition of 10 mg. aureomycin-HCl per kg. of standard turkey starting diet containing 5% menhaden fish meal and 0.25% A and D feeding oil did not significantly change the eating quality of roasted turkeys, 14, 16, and 26 weeks old. Some fishy flavors were noted in both control and treated turkeys. (*C. A.* **47**, 11376)

Unidentified growth factors for the chick in vegetable oils and fatty acid concentrates. Donald S. Carver and Elton L. Johnson (Iowa State Coll., Ames). *Poultry Sci.* **32**, 701-5 (1953). Factors present in corn oil, refined corn oil, soybean oil, wheat-germ oil, an oleic acid concentrate, and linoleic acid concentrate did not affect livability but were necessary for maximum growth of chicks on a diet containing all known vitamins.

Wheat-germ oil and oleic acid concentrate contained relatively large quantities of the factors. (*C. A.* **47**, 11376)

Use of equivalent levels of antibiotics and vitamin B_{12} supplements with cottonseed and soybean meals in chick diets. R. W. Lewis and P. E. Sanford (Kansas State Coll., Manhattan). *Poultry Sci.* **32**, 268-75(1953). Greater growth response was obtained by adding antibiotic (aurofac and bacitracin) and vitamin B_{12} supplements to soybean-meal diets than to cottonseed-meal all vegetable-protein diet. Supplementing a diet containing 15% screw-pressed cottonseed meal with animal protein, soybean meal, antibiotics, and vitamin B_{12} resulted in a satisfactory ration for chicks. (*C. A.* **47**, 11371)

The influence of vitamin A liver storage and strain differences on survival in adult bobwhite quail. T. A. Harper, R. V. Boucher, and E. W. Callenbach (State Coll., Pa.). *Poultry Sci.* **32**, 166-75(1953). No relationship of any kind was found to exist between the vitamin A content of liver of normal birds and the time of survival under conditions of starvation. (*C. A.* **47**, 11371)

Evaluation of vitamin-requirement data. H. J. Almquist (Grange Co., Modesto, Calif.). *Poultry Sci.* **32**, 122-8(1953). A review indicating that the minimum vitamin A requirement for the growth of the chick is approximately 1,000 I.U. per lb. of diet while that of the poult is approximately 2,300 I.U. per lb. of diet. (*C. A.* **47**, 11371)

The healing of soft tissue wounds: the effects of nutrition, anemia, and age. Stanley M. Levenson, F. Ross Birkhill, and Donald F. Waterman (U. S. Army Med. Nutrition Lab., Chicago). *Surgery* **28**, 905-35(1950). Along with numerous other factors, the high-fat diet is studied in regard to its effect on the healing of wounds.

The effects of age and bed rest on plasma fat particles as measured by a fat-tolerance test. Sidney G. White, Walter C. Ralston, and H. O. Carne (Long Beach Veterans Admin. Hosp., Long Beach, Calif.). *Gastroenterology* **18**, 355-60(1951). The effects of the age and activity of individuals on the plasma chylomicron level after a standard fat meal were studied. Activity caused a significant decrease in the maximum levels, but these levels showed relatively little change with the age of the patient, provided the activity was constant. (*C. A.* **47**, 11369)

Cholesterologenic property of certain lipides and vitamins. L. Arrigo and T. Montini. *Boll. soc. ital. biol. sper.* **27**, 268-71 (1951). Previous authors have recorded an increased content of cholesterol in the liver, spleen, and blood of experimental animals fed on diets rich in fat with addition of, e.g., biotin, glycine, or ribonucleic acid. The present authors have injected male rats with linseed, olive, or coconut oil, linoleic acid, and 2 vitamin preparations (α-tocopherol and 2-methylnaphthaquinone (MNQ). With linseed oil, a slight increase in tissue cholesterol was observed, but with MNQ an increase of more than 100% was produced in the liver. It is suggested that MNQ exerts a catalytic effect on the synthesis of cholesterol, indicated by the amount of the latter formed being far in excess of the MNQ injected. (*C. A.* **47**, 11368)

Determination of vitamin A in food and animal feed. H. Moor (F. Hoffmann-La Roche, Basel, Switzerland). *Mitt. Gebiete Lebensm. u. Hyg.* **44**, 257-64(1953). A special method is described which reduces the loss of vitamin A to 7% during the analysis. The ether extracts of the food or feed to be analyzed are stabilized before saponification by adding hydroquinone, chromatographically purified over Al_2O_3, and the vitamin A is then determined colorimetrically with $SbCl_3$ by the Carr-Price reaction. (*C. A.* **47**, 11302)

Cholesterol. II. Metabolism as studied with isotopes. Francois Chevallier (Inst. natl. hyg., Paris). *Ann. Nutrition et aliment.* **7**, 305-38(1963). A review with 137 references. (*C. A.* **47**, 11269-70)

Fat in diet protects from radiation damage. *Science News Letter* **63**, 245(1953). Salad oil, margarin, mayonnaise, and lard contain essential fatty acids which kept alive laboratory rats exposed to heavy doses of x-rays comparable to those given off by an atomic blast. Exposure to x-rays in heavier doses proved fatal in spite of the ingestion of fats.

Nine chemicals to digest fat. *Science News Letter* **63**, 200 (1953). Nine semi-living substances known as enzymes must work in unison for fat digestion. The enzymes necessary for utilization of food chemeicals are found in microscopic rod-shaped structures around the nucleus of cells in the body. From these structures the nine essential enzymes have been separated. Six of the nine had never been isolated before. Fatty acid digestion is in some ways similar to the previously known, but less complicated, breakdown of sugar in the body.

Fat emulsions for oral nutrition. IV. Metabolic studies on human subjects. T. B. Van Itallie, W. B. Logan, R. L. Smythe, R. P. Geyer, and F. J. Stare. *Metabolism, Clin. and Exp.* **1**, 80-8(1952). *Excerpta Med.* **6**, no. 350(1953). When large amounts of fat are added to the diet the food is not accepted in the majority of cases, probably owing to its taste or to epigastric distress produced by the inhibition of gastric peristalsis caused by the presence of fat in the upper intestinal tract. In an attempt to avoid such objections, a new high caloric preparation (fat emulsion) for oral use, containing 40% fat and 10% glucose providing as much as 4 cal./g. is described.

Some factors affecting the growth and development of rats fed rancid fat. S. M. Greenberg and A. C. Frazer, with B. Roberts, technical assistant. *J. Nutrition* **50**, 421(1953). This was a study of the effects of rancid fat on the growth and development of the rat other than the induction of gross vitamin deficiencies. When 10% rancid soybean oil and 30% protein was fed in an adequate diet rat growth was essentially normal. Any differences in growth between rats fed fresh oil and rancid oil can be explained almost entirely by the lowered consumption of rancid fat diets at the beginning of the experimental period. Only the intestinal tract weight suffered from the rancid fat diet. Whole desiccated liver affected organ weight as well as the growth response due to its protein content. Cortisone and several drugs modifying the intestinal flora had no beneficial effect on growth of rats fed rancid fat.

The influence of protein and certain amino acids, particularly threonine, on the deposition of fat in the liver of the rat. A. E. Harper, W. J. Monson, D. A. Benton, and C. A. Elvehjem. *J. Nutrition* **50**, 383(1953). The influence of protein (gelatin and additional casein) threonine, glycine, serine, serine glycocyamine, choline and betaine on the deposition of fat in the livers of rats fed 9% casein-sucrose rations containing adequate choline, methionine, inositol and vitamin B_{12} has been studied. Six percent gelatin, 2% casein or 0.18% DL threonine were each effective in reducing the accumulation of liver fat observed in animals receiving the basal ration. The other compounds listed reduced the accumulation of liver fat to a lesser extent under these conditions. The possibility that enzymes concerned with fat metabolism might have been the limiting factor in animals receiving the basal ration has been discussed, as has also the suggestion that some of these substances may participate more directly in fat metabolism. No satisfactory explanation of the results can be proposed as yet.

The preparation of sodium ribonucleate with the use of sodium dodecyl sulfate. E. R. M. Kay and A. L. Dounce (University of Rochester). *J. Am. Chem. Soc.* **75**, 4041(1953). This paper described a method of preparing sodium ribonucleate from a variety of tissues with the use of sodium dodecyl sulfate. The product from normal adult tissues is protein free, as shown by the negative biuret and Sakaguchi reactions, and also by the absence of detectable amino acids in a hydrolysate of the material. The molecular weight of the isolated product was relatively high as estimated on the basis of viscosity and sedimentation behavior. The ultraviolet absorption curve, with values of $E^{1\%}_{1\,\text{cm.}}$ between 190 and 195, also indicates that the product is relatively undergraded. The yield of the purified material is about 50% as based on the preparation from rat liver.

Enzymatic esterification of α-glycerophosphate by long chain fatty acids. A. Kornberg and W. E. Pricer, Jr. (National Institute of Health). *J. Biol. Chem.* **204**, 345(1953). Esterification of L-α-glycerophosphate (α-GP) by 2 moles of a higher fatty acid, with a concomitant conversion of 2 moles of ATP to inorganic pyrophosphate and adenosine-5′-phosphate, was observed in the presence of a liver enzyme preparation and catalytic quantities of coenzyme A. Palmityl Co A, synthesized chemically or enzymatically, was utilized for a rapid enzymatic esterification of α-GP in the absence of ATP, Co A or fatty acid. The esterified product was purified by precipitation of the sodium salt from alcohol and subsequent chromatography on a Dowex anion exchange resin. The product, which contained two fatty acids and two ester bonds per mole of phosphate, is considered to be a diacyl (palmityl) phosphatidic acid. Straight chain fatty acids with 16, 17, or 18 carbon atoms were far more effective than shorter or longer chain acids in the esterification of α-GP.

Studies on obesity. II. Food intake and oxygen consumption. J. B. Lyon, Jr., M. T. Dowling, and P. F. Fenton (Brown University). *J. Nutrition* **51**, 65(1953). From a study of the caloric intake of highly inbred mice on various fat diets it was concluded that mice of the C_{57} and C_3H strain consumed more calories when fed a 50% fat diet than when fed a 5% fat ration. Mice of the C$_{57}$ strain consumed more oxygen at the 50% level than at the 5% level; thus the extra caloric intake on the high fat diet was oxidized, at least in part. In C$_3$H strain mice oxygen uptake was not increased in response to the greater caloric intake on the high fat diet. The extra calories consumed were deposited as carcass fat.

Metabolism of dietary cholesterol in patients with hypercholesterolemia. *Nutrition Reviews* 11, 231(1953). The conclusion was drawn that a mechanism accounting for a higher specific activity of serum cholesterol ester in hypercholesterolemia was related in some manner to the metabolic defect producing or associated with the abnormal lipoprotein pattern. Furthermore, it was stated that manifestations of the defect in lipid metabolism may be totally independent of concentration of cholesterol in blood serum.

• Drying Oils

Raymond Paschke, Abstractor

A bibliography of publications on industrial protective coatings. Anon. *Org. Finishing* 14, No. 10, 11-25(1953). A listing, according to subject, of books and pamphlets published since 1940 and currently in print.

Directory of suppliers of industrial coatings, equipment and suppliers. Anon. *Org. Finishing* 14, No. 10, 41-66(1953). Included is an alphabetical list of trade names.

Fifty years of paint testing—Committee D-1 (1953), A.S.T.M. Special Technical Publication No. 147.

Review of world's rapeseed. Anon. *Paint Oil Colour J.* 124, 1018(1953). A statistical review 1935 to 1953.

Tung oil—das Holzöl. Anon. *Paint Manuf.* 23, 339(1953). A Critical review of a recent book on the history, production, trade, properties, etc., by E. Fonrobert. 552 pp. with exhaustive bibliography including patents; published in German by Berliner Union Stuttgart.

History of paints and varnishes in Great Britain—Part 2. F. Armitage (L. Berger Ltd., Great Britain). *Paint Manuf.* 23, 319(1953). This article discusses the progress of the medieval period and outlines the economic and working conditions of industry, giving examples of typical costs and prices.

Boiled drying oils. Giorgio Balbi. *Olearia* 6, 144-53(1952). A review.

Oils for printing. Giorgio Balbi. *Olearia* 6, 224-33(1952). A review with 34 references.

The protectometer and the evaluation of anti-corrosive primers. M. A. Danforth, K. H. E. Larson, and W. Bosch (North Dak. Agr. College). *Paint Oil Chem. Rev.* 116, No. 23, 48(1953). The protectometer of Bacon, Smith, and Rugg (*Ind. Eng. Chem.* 40, 161-7) has been adapted to the evaluation of metal primers subjected to salt spray breakdown. Also studied was the effect of varying pigment volume concentration, film thickness, and type of vehicle upon the protection afforded by a primer on iron.

The production and commercial possibilities of diphenic acid. R. E. Dean, E. N. White, and D. McNeil (Coal Tar Research Assn., Gomersal, Eng.). *J. Appl. Chem.* 3, 469(1953). Diphenic acid has been obtained by the direct oxidation of phenanthrene. The alkyl esters are potential plasticizers. Alkyd resins are similar to the phthalic alkyds. 20 references.

A comparison of alkyd flat, latex, and other interior wall paints. John Emmerling *et al.* (Baltimore Club). *Paint Oil Chem. Rev.* 116, No. 23, 66(1953). A continuation of an earlier paper.

Deterioration of alkyd resin films. Emerson B. FitzGerald (E. I. du Pont de Nemours & Co., Philadelphia, Pa.). *Ind. Eng. Chem.* 45, 2545(1953). The study sought a correlation between the light-induced chemical processes and the physical effects occurring particularly at the film surface. The results show that proper spectral distribution is necessary in any accelerated test equipment.

Aqueous industrial enamels. Herbert Hoenel (Riechold Chemicals, Inc., Graz, Austria). *Paint Varnish Production* 43, No. 11, 34(1953). A short history of the development of baking vehicles plus the authors own work with H_2O soluble formulations. 29 references.

Substituted silyl derivatives of starch. R. W. Kear and K. C. Hobbs (Corn Products Refining Co., Argo, Ill.). *Ind. Eng. Chem.* 45, 2542(1953). Thermoplastic and thermosetting silicon derivatives of starch were prepared. They are soluble in hexane but form insoluble films when cured by heating.

Floor coverings in the course of time. P. Kranzlein, *Kunststoffe* 43, 305-8(1953). The most important groups of floor covering are those having as base (1) linseed oil (linoleum), (2) rubber materials, (3) nitrocellulose, (4) felt, (5) polyesters, (6) thermoplastics (polyvinyl chloride), (7) mixts. of 1 and 6, (8) resins and asphaltum-like binders. Manuf. and application are described. 21 references. (*C. A.* 47, 11757)

The reaction between styrene and unsaturated fatty acids. Part I. S. Kut. *Paint Varnish Production* 43, No. 11, 28 (1953). When sorbic acid is reacted with styrene in refluxing xylene soln., a free radical copolymerization occurs simultaneously with the formation of a cyclic, low molecular weight product. The latter is 3-methyl-1,2,3,6-tetrahydro diphenyl-6-carboxylic acid formed by Diels-Alder addition. It is suggested that copolymerization of these two monomers proceeds through a 1,4 addition of the styrene to the conjugated diene system of the sorbic acid. To account for the formation of only one of the two possible Diels-Alder adducts, polar attraction between the reactants is suggested. 45 references. (From Ph.D. Thesis, 1951, U. of London, England.)

The relations between physical constants and drying properties of partially conjugated linseed oils. J. D. v. Mikusch and K. Mebes (F. Thorls Vereinigte Harburger Olfabriken A. G., Hamburg-Harburg, Ger.). *Forbe u. Lacke* 59, 223-8, 271-5 (1953). Isomerized linseed oil paints have outstanding weather resistance. Film brittleness in tung oil is not the result of conjugation. For details see *C. A.* 47, 10868.

Air drying polysulfide rubber paint films. J. R. Panek, J. S. Jorczak, and H. Colon (Thiokol Corp. Trenton, N. J.). *Paint Oil Chem. Rev.* 116, No. 24, 30(1953). Films up to 40 mils in thickness will cure at room temperature in several days. They have excellent oxygen aging and solvent resistance, are flexible down to —65°F., elongate up to 450%, and have the unique property of decreasing up to 100 times in electrical resistance with elongations of only 20%.

Curing agents for epoxy resins. J. Rouse, E. Fleischer, D. Glaser, A. Olson, and H. Wittcoff (Northwestern Club). *Paint Oil Chem. Rev.* 116, No. 23, 72(1953). A study to evaluate cured air-dried and baked coatings based on epoxy resins.

The flax industry looks to the future. E. H. Russell (Minn. Linseed Oil Co.). *Am. Paint J.* 38, No. 10, 34(1954). A discussion emphasizing conservation. The productivity of our soil is deteriorating so fast as to offset all advances in agronomy and breeding. The yield per acre was 11.8 bushels in 1915 and 8.9 busheds in 1953.

Fundamentals of paint, varnish and lacquer technology. Chapter VII. Pigments. Elias Singer (N. Y. Univ.). *Am. Paint J.* 38, No. 7, 65-73(1953). A review.

Recent developments in raw materials. Chapter VIII. Oils (Part 1). *Am. Paint J.* 38, No. 7, 38, No. 10, 64-78(1953). A review.

Electrostatic paint spraying. R. Tilney (H. W. Peabody Ltd., London). Paint Manuf. 23, 335(1953).

PATENTS

Copolymers containing hydrogen bonded directly to silicon. J. B. Rust (Montclair Research Corp. and Ellis-Foster Co.). *U. S. 2,637,718.* Used for varnishes, lacquers, protective coatings, molding compns., and lubricating oils. May be blended with resins and oils. For details see *C. A.* 47, 11804.

Synthetic drying oils. A. E. Hoffman (Universal Oil Products Co.). *U. S. 2,645,649.* The air-drying properties of liquid copolymers of aliphatic monoisoölefin hydrocarbons and conjugated diolefin hydrocarbons are improved by heating to 50-250° with a polyhydric alcohol. For details see *C. A.* 47, 10869.

Hydrocarbon-resin lacquer. H. S. Bloch (Universal Oil Products Co.). *U. S. 2,648,640.* A compn. contg. a polyolefinic resin, an oxidation inhibitor, and a mutual solvent. For details see *C. A.* 47, 11758.

Air-impervious protective coating material. B. G. Brand (Battelle Development Corp.). *U. S. 2,649,424.* For electrical components subjected to high temperatures prepared by heating a cyclic hydrocarbon resin and a drying oil. For details see *C. A.* 47, 11760.

Interpolymer of vinylaromatic compound and conjugated oil fatty acid. E. W. Kanning and E. G. Hart (ARCO Co., Cleveland, Ohio). *U. S. 2,655,488.* A non-gelled resinous interpolymer produced by heating a monovinyl aromatic compound with 30 to 70% by weight of a conjugated fatty acid.

• Waxes

R. L. Broadhead, Abstractor

Methods for obtaining lanolin from wool wash water. Nelly Haidee Greco de Beroqui. *Rev. fac. cienc. quim.* (Univ. nacl. LaPlata) **23**, 125-31(1948). Acceptable lanolin was obtained by acidifying wool wash water with H_2SO_4 to cause flocculation of the grease or by centrifugation with an ultracentrifuge. Wool grease recovery was 70-3%. It was refined best by treating with a mixt. of NH_3 and H_2O_2 followed by steaming. (*C. A.* **47**, 10871)

A new suppository mass based on a solid fusible emulsion. Hans Ubrig (Ottostr. 8, Starnberg a. See Ger.). *Pharmazie* **8**, 219-20(1953). An effective suppository mass can be prepared by mixing 50% hydrogenated peanut oil, 35% polyethylene oxide, 8% eucerin, 2.8% olive oil, 2% Lanette Wax, 2% hexadecyl alc., and 0.2% Nipagin-Nipasol, heating to 75°, and triturating while cooling. (*C. A.* **47**, 10810)

Cheddar cheese demands a proper finish. Cliff Swett (Natl. Wax Co., Chicago). *Butter, Cheese, Milk Products J.* **44**, No. 7, 26-7, 52(1953). Cheese waxes and problems of waxing cheese are discussed. (*C. A.* **47**, 10146)

PATENTS

Metalworking lubricant. Wilbur C. Holmes (to Tap and Drill Corp.). *U. S. 2,645,614,* July 14, 1953. A non-inflammable lubricating paste consists, for example, of a mixt. of 2 parts of paraffin wax, 3 parts of beeswax, 1 part of lubricating oil, and 1 part of CCl_4, part of the latter being present as droplets. This lubricant is valuable for use in the lubrication of drills, taps, cutting tools, or grinding wheels. (*C. A.* **47**, 10836)

Moisture-setting printing ink. Delbert H. Praeg (to Sun Chemical Corp.). *U. S. 2,645,622,* July 14, 1953. A printing ink is described which gives a high gloss upon setting with water vapor or steam. A typical formula contains a condensation product of rosin and maleic acid 18.8, zein 4.23, N-methoxymethylpolyhexamethylene adipamide (softening point 135-140°) 0.47, dipropylene glycol 49.5, barium red lake C pigment 21.0, lithol rubine pigment 2.0, and wax (hydrocarbon or vegetable) 4.0 parts by wt. (*C. A.* **47**, 10243)

Hardened montan-wax derivatives. Frederick W. Breuer and David T. Zentmyer (to Armstrong Cork Co.). *U. S. 2,646,436,* July 21, 1953. Montan-wax derivs. of hardness comparable to carnauba wax are prepd. by esterification of bleached montan wax (I) with a dihydric alc., (II) distillable at $<250°$ and subsequent splitting off of the alc. at reduced pressure. I reacts with II at 100-200° in an inert atm. for 1-14 hrs. Then II is split off by heating to 180-250° at 5 mm. or less. A product of increased mol. wt. and hardness is obtained. It may be used as an emulsion floor wax. (*C. A.* **47**, 10254)

Increasing the capacity and life of the cadmium-iron electrode of an alkaline battery. I. P. Samokhvalov. *U. S. S. R. 78,070,* Dec. 31, 1949. Surface-active substances, such as rosin, turpentine, naphthalene, and wax, are added to the active mass of the electrode. (*C. A.* **47**, 9827)

◆

• Detergents

Lenore Petchaft, Abstractor

Identification of phosphates in laundering compositions. II. E. Heinerth (Fa. Henkel & Cie., Dusseldorf, Ger.). *Fette u. Seifen* **55**, 165-9(1953). Phosphates can be precipitated almost quantitatively from concentrated aqueous solutions of laundering compositions with MeOH. Reprecipitation yields pure phosphates which can then be used for identification. Qualitative tests are reviewed. (*C. A.* **47**, 9036)

Color of soaps. G. Reutenauer (Lab. Iterg, Paris). *Bull mens. inform. ITERG.* **7**, 285-9(1953). Different fats (I) were saponified with KOH, and the solutions of their soaps in BuOH and EtOH were examined in the Lovibond photometer. Colors so obtained correspond closer to color of finished soap therefrom than do colors of the original oils. A safer judgment is based on the laboratory preparation of Na soaps by the Lachampt technique and determination of the Lovibond numbers after repeated graining out. Results obtained with 6 different I before and after saponification are tabulated and discussed. (*C. A.* **47**, 9639)

The action of surface-active compounds in finishing processes. G. Rordorf. *Z. ges. Textil-Industrie* **55**, 428-37, 554-56 (1953). The role of the surface-active agent in various textile processes is examined. In each process considered, the nature of the textile material, the process to which it is subjected, the manner in which a surface-active agent can assist, and the most suitable type of agent are discussed. The processes dealt with include: sizing, felting, washing, carbonizing, kier-boiling and bleaching.

Textile detergents and their most important properties. I. and II. M. Rosch. *Melliand. Textilber.* **34**, 226-7, 351-2, 453-5, 576-9(1953). The principles and development of detergents, together with their properties, are discussed in detail from a chemical standpoint. The properties considered include lathering, wetting, emulsifying, inhibition of lime-soap formation, resistance to acids, alkalis and salts which cause water-hardness, cleansing power, and effect on handle. The usual combinations of fundamental detergent substances are described. A critical survey is made of the problems involved.

Detergents for radiological decontamination. Foster Dee Snell, Gonzalo Segura, Jr., Shepherd Stigman, and Cornelia T. Snell (Foster D. Snell, Inc., New York, N. Y.). *Soap Sanit. Chemicals* **29**, No. 10, 42-4(1953). Soaps and detergents vary in their efficiency in removing radioactive soil from a particular surface. With both, the effectiveness is significantly increased by combination with two parts of "Calgon" as sequestrant. Ease of removal varies greatly with the nature of the surface.

The Drema process—new method for the production of a 70-72% toilet soap. Heinz Zilski. *Seifen-Ole-Fette-Wachse.* **79**, 253-4(1953). The production of an unfilled soap of different crystal structure is described. (*C. A.* **47**, 10251).

Some properties of detergents. A. de Vleeschauwer, E. Wallex, H. Hendrickx, and M. Naudts (Rijkszuivelsta., Ghent, Belg.). *Mededel. Landbouwho-Geschool en Opzoekingsstas. Staat Gent.* **17**, 566-96(1952) (English summary). The number of ml. of N H_2SO_4 necessary to decrease the pH of 1 l. of 1% detergent solution 1 unit is recommended as a new characteristic for detergents and is called the "Index number." A "Washing Index" for detergents was based on the number of submersions in detergent solutions required to remove milk films from glass surfaces. The Rahn method is recommended for determining bacterial activity of detergents. (*C. A.* **47**, 9035)

The mechanical side of toilet soap making. Anon. *Perfumery, Essent. Oil Record* **44**, 324-31(1953). Toilet soap is produced normally by the boiled process, smaller amounts by the cold process and the transparent or alcohol process. The numerous stages in the production of a finished toilet soap from the boiled base in which mechanical means are used are reviewed. These include cooling and solidifying, slabbing, barring and chipping, drying, milling, plodding or compressing, rotary cutting, stamping in presses and molds and dies, and wrapping and cartoning.

Influence of the terminal group on the properties of surface-active compounds with the C_{12} chain. Jean Bolle, Pierre Ragon, and Louis Bourgeois. *Mem. services chim. etat (Paris)* **37**, No. 1, 75-83(1952). The chemical nature of the solubilizing terminal group in compounds containing the lauryl radical is altered by introducing an atom or an alkyd group between the chain and the terminal group. Such change affects the surface-activity, foaming, and wetting properties. Compounds prepared and studied were: Na 1-dodecane-sulfonate (I), dodecyl Na sulfate (II), Na 2-(dodecyloxy)-ethane-sulfonate (III), and dodecyl Na thiosulfate ($C_{12}H_{25}SSO_3Na$) (IV). Parallelism between surface-activity and foaming property was found. The more surface-active compound foamed better. Explanation is that the $-SO_3Na$ group has the smallest coordinative effect, thus smallest power for micelle formation. Introducing an O atom to form $-SO_3Na$ brings in secondary valences facilitating the formation of coordinate bonds, but this effect is tempered by the hydrophilic nature of O, which draws water between the polar molecules of the micelles. Same is true of $-OCH_2CH_2SO_3Na$ but here the hydrophilic nature of O is masked by the neighboring C atoms. However, in $-SSO_3Na$, S is hydrophobic and its coordinating properties are normal, thus IV has the lowest critical micelle concentration and the highest foaming property. Wetting is studied by spreading the drop on a paraffin-coated glass plate. Solutions are O.OO1M with pH 8.8. Surface/volume values are higher for II and III showing their better wetting properties as well as the hydrophilic character of O. (*C. A.* **47**, 10874)

A chemical measure of the effect of soaps and detergents on the skin. E. J. Van Scott and J. B. Lyon (Univ. of Pennsylvania, Philadelphia, Pa.). *J. Investigative dermatol.* 21, 199-203 (1953). To determine whether soaps and detergents, as commercially available, might alter the keratin molecule in such a way as to expose sulfhydryl groups, a number of products were tested for their sulfhydryl-exposing capacity on human keratin. Stratum corneum, nails and hair were incubated in solution of various soaps and detergents. By this treatment the measurable amounts of sulfhydryl groups were increased over those of control solutions. These findings indicate a certain denaturing effect of these substances on the keratin molecule. It is possible that the magnitude of such in vitro effects might be correlated with the relative incidence of dermatitis from these products.

Effect of $C_{12}H_{25}(OCH_2CH_2)_nOH$-type nonionic products on interfacial properties. Max Cohen. *Mem. services chim. etat (Paris)* 37, 85-9 (1952). Lauric acid reacts with ethylene oxide to give polymeric substances whose hydrophilic nature increases when n (no. of OCH_2CH_2 groups) increases. Interfacial properties like surface tension (s.t.) and solubilization are affected when the value of n changes. Critical micelle concentration of 0.0002 M is lower than are those of ionic type with C_{12}. S.t. is higher for compounds with large n values. This shows that the saturation pressure of the adsorbed layer diminishes when the hydrophilic nature of the molecule increases. When hexane, toluene, benzene, and heptyl alcohol are solubilized by the polymeric alcohol, it is seen that the value of n must be increased as the hydrophilic character of the solubilized organic compound increases. (*C. A.* 47, 10312)

The Sharples continuous soapmaking process. K. H. V. Day. *Perfumery, Essent. Oil Record* 44, 320-23 (1953). The four stages in the Sharples continuous soapmaking process are reviewed. The advantages and economies in steam consumption, glycerine concentration, labor and reworking of soap are discussed.

Prevention of soil redeposition in textile cleaning operations by proteins and other polymeric materials. W. Fong and H. P. Lundgren (Western Regional Research Laboratory, Albany, Calif.). *Textile Research J.* 23, 769-75 (1953). Certain proteins and other polymeric materials have been found highly effective in preventing the redeposition of carbon black, a test soil, on cotton fabric in aqueous cleaning systems containing an alkylarylsulfonate detergent and alkaline builders. The soil-redeposition-preventing properties of the various proteins tested were found to be correlated approximately with their proline content. The proline-rich proteins gave good to excellent whiteness-retention. Of several synthetic polymer materials investigated, the uncharged types were more effective than the charged types. For the uncharged polymers, polyvinyl pyrrolidone, polyvinyl alcohol, and polyethylene glycol, an optimum degree of polymerization was observed for maximum effectiveness. The pronounced effect of electrolytes in decreasing whiteness-retention activity of the effective whiteness-retention additives indicates the importance of electrokinetic effects. Similarly, decrease in whiteness-retention activity with a shift to lower pH levels suggests a relation to electrical potential of soil and/or fabric.

Spray-dried detergents. H. Mannek. *Seifen-Ole-Fette-Wachse.* 79, 297-9 (1953). A discussion of the spray-drying process for industrial cleaners, detergent powders with soap, and synthetic detergent powders. (*C. A.* 47, 10874)

Effect of chain length on tensio-active properties. C. Paquot. *Mem. services chim. etat (Paris)* 37, No. 1, 91-102 (1952). A rapid review of the literature on foaming and wetting properties of soaps and detergents shows that whenever the saturated lauric acid chain, C_{12}, or the oleic acid chain, C_{18}, is found in surface-active agents, either as sole component or as impurity, they show higher wetting and foaming properties than do those that do not contain these chains. If the active or solubilizing group (i.e. $-COONa$, $-SO_3Na$) is moved from the end to other positions on the chain, the tensio-active properties of the compound are altered. When the formula of such compounds is represented by $H(CH_2)_nCH(OSO_3Na)(CH_2)_{n'}H$, where $n + n'$ is constant, if $n = n'$, foaming and wetting properties are at a maximum. If $n' = 0$ (or $n = 0$), these are at a minimum, but detergent and emulsifying qualities are at a maximum. (*C. A.* 47, 10312)

Nonionic surface active agents. James L. Rainey and C. E. Denoon, Jr. (Rohm & Haas Co., Philadelphia, Pa.). *Chem. Eng. News* 31, 4521-3 (1953). The base materials for manufacturing nonionic surface-active agents are ethylene oxide, ethylene oxide derivatives such as polyethylene glycol and diethanolamine, glycerol, and sorbitol. The principal hydrophobe sources are alkylphenols, tall oil, long-chain fatty acids and fatty amides, straight and branched chain alcohols and amines, and branched chain mercaptans. The nonionics are stable and effective in acids, bases and hard water. They can be made and shipped in anhydrous, salt-free form. The hydrophil-hydrophobe ratio can be easily controlled so specific products for specific applications may be prepared. These applications may include use in the dairy field as detergent sanitizers, as therapeutic agents in treatment of tuberculosis, as petroleum demulsifiers, latex stabilizers, corrosion inhibitors, aids for wet processing of phosphate fertilizers. Production figures and trade name products available are included.

Sinitiro Kawamura, Abstractor

A review of recent studies on soaps. Masao Nonaka. *J. Oil Chemists' Soc., Japan* 2, 115-18 (1953). 81 references.

PATENTS

Improvements in detergent product. Procter & Gamble Co. *Brit. 697,248.* A detergent product having milled soap properties is prepared from a mixture of soap, water and a soap-compatible sodium salt by adjusting the salt content from 1 to 12%, and the water from 20 to 40% by weight, subjecting to a kneading, shearing and compacting treatment under pressure at a temperature below the solidification temperature and below that at which neat soap can exist so that a product is produced in which the soap is waxy, translucent and predominantly in the beta phase.

Improvements relating to abrasive cleansing compositions. Colgate-Palmolive-Peet Co. *Brit. 698,427.* The caking of an abrasive cleansing composition consisting essentially of a water-insoluble siliceous abrasive material is prevented by the addition of a powdered synthetic hydrated magnesium silicate which adheres to the sticky surfaces of the particles and prevents their clumping.

The production of soap from sperm or the like oils. Fritz Gottfried Laupichler. *Brit. 699,072.* Soap, fatty alcohols and hydrogen or just soap and hydrogen may be produced continuously from sperm oil by first substantially saponifying by means of alkali the esters in the oil and subjecting the mixture of soap and fatty alcohols to the action of further alkali under conditions which bring about complete alkali conversion of the fatty alcohols to soap with liberation of hydrogen.

Sulfated alcohol detergents from reaction product of primary monohydric alcohols with ethylene. Fred W. Banes, William P. Fitzgerald, and Joseph F. Nelson (Standard Oil Development Co.). *U. S. 2,655,525.* Alkyl sulfate detergents are produced by reacting monohydric alcohol containing from 10 to 18 carbon atoms per molecule with a sulfating agent and recovering the alkyl sulfate detergent product from the sulfation reaction mixture, said monohydric alcohol having been prepared by a process comprising reacting a primary monohydric alcohol of 1 to 4 carbon atoms with ethylene in the presence of a peroxide activator.

Process of cooling spray dried detergents. Lowell A. Ledgett, Charles W. Deane, and John J. Mahoney (Colgate-Palmolive-Peet Co.). *U. S. 2,657,797.* Spray dried organic detergent particles are cooled by introducing particles discharged from a spray tower and still at a temperature too high for packaging into a current of ambient air moving at a velocity of about 30 feet to 70 feet per second in an upward direction, separating the particles from the air after a few seconds' contact, passing the particles downwardly through a plurality of sloping classifying screens, passing streams of cooling air from opposite sides transversely into the stream of particles above the bottom screen and withdrawing the air upwardly through the upper screen.