proposed by Woolley for lipositol (10). In soybean inositides by contrast sugar appeared only to be "carried along" rather than to be a component of the molecule.

The percentages of phosphorus, nitrogen, and inositol are greater in the fractions comprising the large peaks at each edge of the curve than in the center. For example, tube 0 contains 3.6% phosphorus, 1.2% nitrogen, and 8% inositol, and tube 24 contains 2.7% phosphorus, 1.5% nitrogen, and 9% inositol. In tube 15, which constitutes a small peak at the center of the weight curve, there is only 2.1% phosphorus, 0.27% nitrogen, and 5% inositol. In considering the inositol contents, it should be pointed out that the inositol was estimated by a microbiological assay. This procedure is highly specific for inositol, but the results are considered to be accurate to only about 10%.

In the work with soybean phosphatides it appeared that the phosphoinositides contained two moles of phosphorus for each mole of nitrogen and inositol. However the phosphorus to nitrogen and phosphorus to inositol ratios of the corn inositide fractions vary widely and somewhat irregularly. Since in most cases the ratios do not approximate whole numbers, it seems unlikely that any fraction contains a single pure compound. However it is observed that in the left hand portion of the curve phosphorus to nitrogen ratios are greater than one while in the right hand portion of the curve the ratio is one or slightly less than one. As can be seen from the curves in Figures 2 and 3, tubes 23 and 24 appear to contain a large amount of material with one mole of phosphorus for each mole of nitrogen and sugar.

Summary

Corn phosphatides have been separated into alcohol-soluble and alcohol-insoluble fractions employing the same procedure previously used with soybean phosphatides. Alcohol-soluble and alcohol-insoluble portions have been fractionated by countercurrent distribution. The alcohol-soluble portion was found to contain lecithin and a small amount of cephalin. In addition to the phosphatides a nitrogen containing compound was concentrated in the 95% methanol-soluble fractions along with a small amount of sugar. As with the corresponding alcohol-insoluble fraction from soybean phosphatides, two major types of phosphoinositides are found to be present, those more soluble in hexane and those more soluble in 95% methanol. In contrast to soybean phosphatides most of the sugar is concentrated in the hexane-soluble fractions. The phosphorus to nitrogen and phosphorus to inositol ratios vary widely and do not approximate two as was the case in the soybean inositides. However the more hexane-soluble fractions seem to be made up largely of material with one mole of phosphorus for each mole of nitrogen and sugar.

Acknowledgment

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ABSTRACTS . . . . Don Whyte, Editor

• Oils and Fats

R. A. Reiners, Abstractor

RAPID FAT DETERMINATION IN PLANT CONTROL OF CACAO PRODUCTS. F. X. Kobe (Rockwood and Co.). *Anal. Chem.* 22, 700 (1950). Finely ground samples are extracted with petroleum ether at room temperature and the solids separated from the miscella in a centrifuge. Results are comparable to those obtained by the A.O.A.C. method.

MICRODETERMINATION OF UNSATURATED FATTY ACIDS BY ALKALI ISOMERIZATION. L. C. Berk, N. Kretchmer, R. T. Holman, and G. O. Burr (Univ. of Minnesota). *Anal. Chem.* 22, 718 (1950). The ethylene glycol-potassium hydroxide reagent normally used for alkali isomerization is unsuitable for isomerization of small (100 microgram) samples of fat due to high background absorption. This difficulty is avoided by isomerization in aqueous potassium hydroxide at high temperatures (180°).

DETECTION OF SOLVENT RESIDUES IN EXTRACTED GROATS. W. Wodsak (Hyg. Inst. Hansestadt, Hamburg, Ger.). *Z. Lebensm.-Untersuch. U. -Forsch.* 90, 265-72(1950). Detection of residual solvent in commercial solvent extraction residues was possible by determining the fluorescence of the steam distillate of the isobutyl alcohol-treated sample or by determining the vapor pressure of the materials volatile under high vacuum. A 100-g. sample under vacuum was heated to 160°, and volatile material was condensed with liquid air. The vapor pressure of the condensate at 0° was determined. (*Chem. Abs.* 44, 6044)

DETERMINATION OF NEUTRAL FAT IN THE HIGHLY ACID FATS. F. Provvedi (Lab. Chim. Provinciale, Bergamo, Italy). *Olii Minerali, Grassi E Saponi, Colori E Vernici* 26, 69-72(1949). Dissolve 5 g. of the fat in 50 cc. of 95% ethanol, saponify, add H_2O to obtain a 50% alcohol solution, decompose the soap with H_2SO_4, dissolve the fatty acids in petroleum ether, evaporate the solvent, and weigh the residue. Determine the acid no. of the fatty acids (I_a) and that of the original fat (I_f), and calculate the % of the fatty acids by the formula: $X = 100\, I_f/I_a$. The neutral fat is: 100 − X. (*Chem. Abs.* 44, 5119)

THE ESTIMATION OF HORSE-FAT IN ADMIXTURE WITH OTHER FATS. R. A. Dalley. *Analyst* 75, 336(1950). The method depends on the presence in horse-fat of ½% of linoleic acid and its relative scarcity in other animal fats. Satisfactory results were obtained on mixtures containing as little as 5-10% horse-fat admixed with pig, mutton, and beef fat.

QUALITATIVE REACTION FOR SESAME OIL IN OTHER FOOD OILS. N. E. Bührer (Inst. Biol., Curitiba, Brazil). *Arquiv. Biol. E. Tecnol., Inst. Biol. E Pasquisas Tecnol., Curitiba, Brazil* 3, 57-9(1948). Tests with pure and mixed almond and sunflower oils showed that the Villavecchia-Fabris test (0.1 ml. of a 2% solution of furfural in the presence of HCl) is reliable. (*Chem. Abs.* 44, 5492)

CHROMATOGRAPHIC DETERMINATION OF VOLATILE FATTY ACIDS IN SILAGE. E. Brouwer and H. J. Nijkamp (Landb. Hogeschool, Wageningen, Netherlands). *Chem. Weekblad* 46, 37-9(1950). Chromatographic examination of 10 samples of grass silage showed that formic acid, propionic acid, and some higher volatile fatty acid may be present besides acetic and butyric acids. In silages with low pH the contents of formic and propionic acids are negligible. In the higher pH silages the distillation method of Duclaux-Boekhout-Wiegner does not give correct figures for the acetic and butyric acids, which is in contrast to the good results with the low pH silages. (*Chem. Abs.* **44**, 5495)

THE DETERMINATION OF SQUALENE IN THE UNSAPONIFIABLE MATTER OF FATS. I. S. Anselmi and R. Monacelli (Ist. Super. Sanita, Rome). *Ren. Ist. Super. Sanita (Rome)* **12**, 358-71 (1949). A sample of olive oil was tested for squalene by the method of Filetson as given in A.O.A.C. Methods of Analysis, 6th edition, 1945, and the results showed that the method should be studied to improve its precision and accuracy. (*Chem. Abs.* **44**, 5617)

THE CRITICAL POINTS OF FATS WITH ANILINE APPLIED TO THE CONTROL OF PURITY OF CACAO FAT. F. Th. van Voorst (Keuringsdienst voor Waren, Alkmaar, Netherlands). *Chem. Weekblad* **46**, 150-1(1950). A method for the determination of the critical points of fats with aniline is given, by which the critical point can be determined within 0.1°. The critical point of cacao fat was found to be 42.9. The effect of the presence of butterfat on the critical point was studied, and it was found that in the presence of up to 20% butterfat there is a decrease of 0.2° of the critical point per percentage of butterfat. (*Chem. Abs.* **44**, 5616)

ANALYSIS OF DEHYDRATED CASTOR OIL. D. O. Bartl. *Chem. Listy* **37**, 90-102, 109-12(1943). Four hundred % excess IBr is required to obtain correct values for the I no. (Hanus method). As dehydration of castor oil proceeds, the I no. increases to a constant final value of 148 after 6-8 hours. The hydroxyl no. decreases gradually. Discrepancies between the 2 numbers are explained by condensation reactions. (*Chem. Abs.* **44**, 5617)

THE INFLUENCE OF ENVIRONMENT UPON THE COMPOSITION OF SUNFLOWER SEED OILS. I. INDIVIDUAL VARIETIES OF SUNFLOWERS GROWN IN DIFFERENT PARTS OF AFRICA. C. Barker and T. P. Hilditch (Univ. of Liverpool). *J. Sci. Food Agr.* **1**, 118(1950). Sunflowers grown from named varieties of seed in Southern Rhodesia, Kenya, and Tanganyika gave seed oil of somewhat varying composition, but the seed oil from all varieties grown in any one location were practically identical in composition. Seed harvested only two months after planting gave oils of extremely low unsaturation.

II. COMPOSITION OF THE SEED OILS OF SUNFLOWERS GROWN IN ENGLISH GARDENS FROM FIVE SPECIMENS OF DIFFERENT AFRICAN SUNFLOWER SEED. *Ibid.* 140. Five specimens of sunflower seeds from Africa, the oils in which varied widely in composition (44-72% linoleic acid), were grown in England, and the composition of the resulting English-grown seeds was about the same in all cases. Most of the oils contained, on an average, 68-70% linoleic acid. Varietal factors play little part in determining the composition of sunflower seed oils. The high linoleic content is conditioned by slow development and ripening of the seed.

CHANGES IN COMPOSITION OF COTTONSEED DURING DEVELOPMENT AND RIPENING. D. N. Grindley (Sudan Medical Service, Khartoum). *J. Sci. Food Agr.* **1**, 147(1950). Analyses of cottonseed *(Gossypium hirsutum)* grown in Khartoum, made at different stages of maturity after flowering, indicate no appreciable amount of oil is in the seed until about 35 days after flowering, after which it increases rapidly. The oil first formed is highly acidic and contains much unsaponifiable matter although the composition of the fatty acids remains practically constant over this period.

THE COMPONENT FATTY ACIDS OF VARIOUS SUDAN VEGETABLE OILS. *Ibid.* 152. The composition is given of the fatty acids present in the fats extracted from the following materials: *Hyptis spicigera, Luffa cylindrica, Lagenaria vulgaris, Citrullus vulgaris, Courbonia virgata* (husks and kernels), *Capparis tomentosa* (kernels), and *Parinarium curatellifolia.*

EDIBLE OILS. W. H. Shearon Jr., H. E. Seestrom, and J. P. Hughes. *Ind. & Eng. Chem.* **42**, 1266 (1950). Modern methods of processing vegetable oils are reviewed.

RED-BERRIED ELDER AND ITS OILS. K. Voituret. *Seifen-Ole-Fette-Wachse* **76**, 115(1950). Both the seed and pulp of the berry of *Sambucus racemosa* (red-berried elder) yield a turbid dark oil; the oil from the seed is of disagreeable taste and contains a weakly poisonous irritant. The oil can be refined for alimentary purposes by an absorption process or by treatment with caustic. (*Chem. Abs.* **44**, 6169)

EDIBLE SOYBEAN OIL. R. L. Terrill (Soybean Research Council). *Soybean Digest* **10** (9), 14(1950). The importance of soybean oil in the present fat and oil picture is discussed.

Ammi visnaga: COMPOSITION OF THE FATTY ACIDS PRESENT IN THE SEED FAT. D. N. Grindley (Sudan Med. Service, Khartoum). *J. Sci. Food Agr.* **1**, 53-6(1950). Analysis of the fatty acids derived from the fat extracted from the seeds of *Ammi visnaga* showed saturated acids 5, solid isomer octadecenoic acid 50, liquid isomer octadecenoic acid 32, and octadecadienoic acid 13%. The identities of linoleic, oleic, petroselenic, and palmitic acids were established. (*Chem. Abs.* **44**, 5617)

COMPONENT ACIDS AND GLYCERIDES OF DIKA FAT. M. L. Meara and C. B. Patel (Univ. of Liverpool, Eng.). *J. Sci. Food Agr.* **1**, 48-51(1950). Dika fats are obtained from the seeds of various species of the genus *Irvingia.* The component fat acids were capric 2.0, lauric 46.6, myristic 44.1, palmitic 5.2, oleic 1.9, and linoleic 0.2 (mole %). The chief component glycerides were trilaurin 7.1, myristodilaurin 32.5, caprolauromyristin 5.2, lauromyristopalmitin 12.1, laurodimyristin 28.7, trimyristin 5.1, and oleolauromyristin 5.1 (mole %) (*Chem. Abs.* **44**, 5617)

CULTIVATION OF SAFFLOWER IN THE GIRONDE REGION (A PRELIMINARY NOTE). G. Sag (Societe Vitex, Bordeaux, France). *Rev. Intern. Botan. Appl. et. Agr. Trop.* **30**, 216-22(1950). Safflower varieties from Europe and Morocco were cultivated on soils poor in N and deficient in K. A decrease in the oil content of seeds from 24 to 20% was noted. The oils of European varieties had saponification value 201 and I value 133, while the Moroccan seeds gave oils with saponification value 194 and I value 122. (*Chem. Abs.* **44**, 5617)

RECENT ADVANCES IN THE STUDY OF COMPONENT ACIDS AND COMPONENT GLYCERIDES OF NATURAL FATS. T. P. Hilditch (Univ. of Liverpool, Eng.). *Forchr. Chem. Org. Naturstoffe (Springer Verlag, Vienna, Austria)* **5**, 74-100(1948). Review with many references. (*Chem. Abs.* **44**, 5617)

CONSTITUENT OF SEED OIL OF *Cycus revoluta.* S. Ueno, S. Matsuda, and T. Kimura. *J. Nippon Oil Technol. Soc.* **2**, No. 5, 10-15(1949). Constants of oil prepared by ether extraction are: yield of oil 20.4%, acid no. 182.2, saponification no. 199.7, I no. 59.8, unsaponifiable substance 4.60%, melting point 44°. The fat acids consist of palmitic, stearic, oleic, and a small amount of behenic. (*Chem. Abs.* **44**, 5618)

ON THE VALUE AND EVALUATION OF SOME HUNGARIAN NUTS. Jeno Becker and P. Maliga. *Bull. Faculty Hort. Viticult., Univ. Agr. Sci (Budapest)* **10**, 86-93(1944) (Pub. 1945). Walnuts contained an average of: 4.1% water, 61.2% oil, 19.0% raw protein, and 0.09 mg. % vitamin B_1. The oil and protein contents seemed independent of the size of the walnuts but were related to each other; generally a lower content on protein was found with more oil. (*Chem. Abs.* **44**, 5494)

CATALYTIC OXIDATION OF MONOETHENOID FATTY ACIDS; THE CATALYTIC INFLUENCE OF CATIONS OF METALS OF THE TYPICAL AND TRANSITIONAL SERIES IN AUTOXIDATION PROCESSES. J. H. Skellon (Acton Tech. College, Eng.). *J. Soc. Chem. Ind.* **69**, 116(1950). The oxidation of oleic acid was studied at 120° in the presence of various metal catalysts. The catalytic activity of the metal ions is correlated with their atomic structure and is shown to be a periodic function.

AUTOXIDATION OF SATURATED FATTY ACIDS. C. Paquot and F. de Goursac. *Bull. Soc. Chim. France* **1950**, 172-3. Long-chain saturated fatty acids and their esters are oxidized by molecular oxygen at 100° and by catalytic use of 1% Ni phthalocyanine or 20% Na and K soaps of the acids used. The principal oxidation products are lower fatty acids containing even numbers of C atoms. Lower acids oxidize with more difficulty than acids of high molecular weight. The results indicate that the autoxidation of saturated fatty acids is effected through β-oxidation; the isolation of small amounts of lactones in the oxidation product indicates some γ- and δ-oxidation. (*Chem. Abs.* **44**, 5311)

OLEIC ACID FROM RICE OIL FOR TEXTILES. S. Naito and T. Tsuchiya. *J. Nippon Oil Technol. Soc.* **2**, No. 6, 13-19(1949). Oleic acid prepared from rice oil had I no. 117.3; it cannot be used for textiles without antioxidants. Addition of 0.5% α-naphthol showed, in the MacKey test, the rise in temperature to 96° after 173 minutes. (*Chem. Abs.* **44**, 5618)

UTILIZATION OF RICE OIL. J. Kawai and S. Kinoshita. *J. Nippon Oil Technol. Soc.* **2**, No. 6, 33-7(1949). Rice oil having an acid no. 120 is esterified with ethanol and hydrogenation of the product containing 80% ester gave a product m. 33.2-3.6° with acid no. 2.7 and I no. 6.1. It is suitable as a substitute for cacao fat. (*Chem. Abs.* **44**, 5617)

DECOLORIZATION OF RICE OIL BY HYDROGEN PEROXIDE. II. J. Kawai. *J. Nippon Oil Technol Soc.* **2**, No. 5, 16-19(1949). Use of 2% H_2O_2 (29.5%) on oils having high acid no. and subsequent treatment with 4% acid clay or acid clay-activated C gave good results. (*Chem. Abs.* **44**, 5618)

EFFECT OF ADDITION OF WATER ON THE RATE OF HYDROLYSIS OF PALM OIL IN AUTOCLAVE WITHOUT CATALYST. C. Yanase. *J. Nippon Oil Technol. Soc.* **2**, No. 6, 7-12(1949). In hydrolyses of oil at 200° and 284 psi for 15-180 minutes with the ratio of oil and water at 1:0.7 or 1:2.0, the rates of hydrolysis of oil were 1 and 1.14. (*Chem. Abs.* **44**, 5617)

EFFECT OF CATALYSTS ON HYDROLYSIS OF FATS AND OILS IN THE AUTOCLAVE. I. THE EFFECT OF LIME. C. Yanase. *J. Nippon Oil Technol. Soc.* 2, (5), 23-32(1949). The coefficient of hydrolysis (percentage of hydrolysis with 1% CaO/percentage of hydrolysis without CaO) at 160° and 31 atm. was 27; at 180° and 42 atm. was 2.5; at 200° and 49 atm. was 1.7; and at 250° and 73 atm. was 1.0.

II, EFFECT OF MAGNESIA. *Ibid.* 32-40. In hydrolysis at 180° with initial pressure at 284 psi, ZnO gave better results than Zn powder or MgO. Addition of 1% emulsifying agent, e.g., triethanolamine or lecithin, resulted in no particular benefit. (*Chem. Abs.* **44**, 5615)

SODIUM CHLORITE IN THE FAT INDUSTRY. J. Mouton and R. Borezee. *Oleagineux* **4**, 271-280(1949). The use of $NaClO_2$ either alone or in the presence of acids, such as H_3PO_4, to bleach animal or vegetable fats is discussed. (*Biol. Abs.* Sect. J. **24** [5], 6)

SOLVENT EXTRACTION OF VEGETABLE OILS. C. C. McInnes (Am. Mineral Spirits Co., Chicago). *Am. Paint J.* **34**, No. 30, 86-88, 90, 92(1950). Tables list commercial extraction solvents, distillation figures on hexane, and properties of commercial-grade isopentane, normal pentane, isohexane, cyclohexane, isoheptane, and isoöctane. (*Chem. Abs.* **44**, 5617)

THE PRACTICAL PREPARATION OF FATTY ACIDS OF A HIGH DEGREE OF PURITY. I. LAURIC ACID. P. Ragon and Jean Bolle (Lab. Central Services Chim. Etat, Paris). *Mem. Services Chim. Etat (Paris)* **34**, 337-41(1948). Lauric acid, m.p. 43.6-0.7° and solidification point 43.4°, was prepared from the ethyl esters of palm oil fatty acids by distillation first in a 30-cm. column, then distilling the laurate fraction in a 50-cm. spiral column to give a fraction, b_{12} 143-6°, m.p. 40-1°. This was further purified by dissolving 100 g. in 250 cc. alcohol at 95°, neutralizing with approximately 250 cc. of a hot, saturated aqueous LiOH solution, adding 250 cc. 50% alcohol, and crystallizing Li laurate by cooling to 15°. The precipitate was recrystallized repeatedly from 50% alcohol. The acid was obtained by acidification with HCl. Constants are given for various nitrogen derivatives (ammonia, ethylene diamine, hexamethylene diamine, and piperazine). (*Chem. Abs.* **44**, 6168)

PURIFYING CRUDE GLYCERINE BY ION EXCHANGE. F. H. Kahler (Illinois Water Treatment Co.). *Chem. Eng.* **57**, 109(1950). The steps in the ion exchange purification of glycerine are outlined. Ion exchange is claimed to be cheaper than distillation for crudes with less than 10% ionized solids and for sweetwaters with less than 2% ionized materials.

INHIBITION OF BUTTERFAT AUTOXIDATION. H. Willstaedt and A. Reinart. *Arkiv. Kemi* **1**, 319-24(1949). Lactaroviolin, a pigment which is an unsaturated aldehyde of the azulene series, is highly effective as an antioxidant for butterfat. It is indicated that unsaturated diketones have the opposite effect. A review is given of the major classes of antioxidants. (*Chem. Abs.* **44**, 5491)

THE PROPERTIES OF NEW ZEALAND BUTTERS AND BUTTERFATS. II. THE RELATION OF HARDNESS OF NEW ZEALAND COMMERCIAL BUTTER TO COMPOSITION OF THE BUTTERFAT. R. M. Dolby (Dairy Research Inst., Palmerston North, New Zealand). *J. Dairy Research* **16**, 336-47(1949). Hardness determinations were made on monthly samples of butter from 9 factories in New Zealand over the course of 3 years. The iodine value and softening point of the fat was correlated with the hardness of the butter. The increase in iodine value was accompanied by a compensatory change in the proportions of the lower saturated acids so that the average m.p. of the fat remained the same. The softening point is dependent on the glyceride structure rather than the proportions of the individual fatty acids. (*Chem. Abs.* **44**, 5491)

POSSIBILITY OF COLOURING VANASPATI WITH RATANJOT TO PREVENT ITS USE AS AN ADULTERANT IN GHEE. Kothavall (Indian Dairy Res. Inst., Bangalore). *Indian Jour. Vet. Sci. and Animal Husbandry* **17** (3), 171-176(1947). It is suggested that the red dye obtained from the roots of ratanjot (*Onosma echiodes*—Boraginaceae) be used to color hydrogenated vegetable oils to prevent their use for the adulteration of ghee. (*Biol. Abs.* Sect. G., **24**, 32)

EFFECT OF HEAT ON THE CHEMICAL COMPOSITION OF GHEE. J. N. Trivedy, G. K. Murthy, S. M. Kukade, and N. N. Dastur (Indian Dairy Res. Inst., Bangalore). *Indian Jour. Dairy Sci.* 1 (3), 69-77(1948). The chemical constants of cow and buffalo ghee (clarified butter fat) heated up to 250° for 5 to 45 minutes are given. Samples heated over 125° give burnt and tallowy flavor. The peroxide value of samples increased rapidly at 175°. Nearly 79% of color in cow ghee was destroyed at 175°. (*Biol. Abs.* Sect. G., **24**, 33)

FACTORS INFLUENCING THE KEEPING QUALITY OF GHEE. D. P. Persai and C. R. Barnicoat (Massey Agr. Coll., Palmerston North, New Zealand). *J. Dairy Research* **16**, 356-62(1949). Of the four main factors commonly regarded as influencing keeping properties of ghee (moisture content, acidity, heat-treatment, and type of bacterial culture used in souring) the heat-treatment was the most important. The higher the final temperature (110° and higher) attained during evaporation, the better were the keeping qualities of the product, provided the butter had been heated in contact with the curd, boiled as rapidly as possible, and given a minimum amount of stirring. The improved keeping properties conferred on ghee heated to 110-150° were due to antioxidants (apparently phospholipids) extracted from the curd during cooking. Initial acidity and moisture contents had no effect on storage life of ghee at 38°. Souring milk to 2.5 to 3.0% lactic acid did not detract from the keeping quality of the ghee made from it. Storage life of ghee at 38° could be predicted with fair accuracy from its rate of oxidation at 100° (*Chem. Abs.* **44**, 5491)

PRESERVATION OF RAW TALLOW. M. T. Francois and A. Sergent (Lab. Chevreul, Paris). *Bull. Mens. Iterg.* **4**, 151-3 (1950). Low quality tallow was washed with water thoroughly and then stored under a sodium acetate-acetic acid buffer (pH 3.15) for 15 days at 30°. Substantially no hydrolysis of the fat occurred during this period. (*Chem. Abs.* **44**, 6171)

STORAGE OF GHEE IN DIFFERENT TYPES OF CONTAINERS. T. M. Paul, V. R. Bhalerao, and C. P. Anantakrishnan (Indian Dairy Res. Inst., Bangalore). *Indian Jour. Dairy Sci.* 2 (1), 7-11(1949). Cow and buffalo butter fats were stored in various containers for 6 months. Butter fats stored in mud, brass, and bronze containers quickly became rancid. Samples kept well in glass, porcelain, aluminum, and tinned-iron. (*Biol. Abs.* Sect. G., **24**, 32)

PATENTS

EXTRACTION PROCESS AND APPARATUS. B. B. Beeson (French Oil Mill Mach. Co.). *U. S. 2,512,710.* A process is disclosed for the solvent extraction of fats from fat bearing materials in which the drainage of the solvent through the material is increased by vibrating the material.

PROCESS FOR STABILIZING EDIBLE FATTY OIL. F. A. Lindsey Jr. and W. T. Maxwell (Southern Cotton Oil Co.). *U. S. 2,513,948.* A fatty oil is stabilized by adding citric acid and heating the mixture to 120-190° until a substantial part of the citric acid is converted to aconitic acid or aconitic anhydride acid. The treatment is stopped before any appreciable amount of itaconic anhydride is formed.

PROCESS OF PREVENTING RANCIDITY OF COOKING FATS. E. B. Doolin. *U. S. 2,514,479.* The formation of peroxides and the development of rancidity are inhibited during the storage of used cooking fats by pouring the hot fat (at least 330°F.) into a container until the container is full and then sealing the container so that it is air-tight.

METHOD OF SEPARATING GLYCERIDES. V. J. Muckerheide (Emery Industries Inc.). *U. S. 2,514,608.* Triglycerides are dissolved in isopropyl acetate, ethyl acetate, or methyl isobutyl ketone, the solution rapidly chilled to precipitate the more solid triglycerides, and the solids removed from solution.

DESTEROLATION. K. C. D. Hickman (Eastman Kodak Co.). *U. S. 2,515,041.* Oil concentrates are dissolved in methanol or ethylene glycol (1-10% solution) and the precipitated sterols collected.

Biology and Nutrition

R. A. Reiners, Abstractor

DISTRIBUTION OF TRACER CARBON AMONG THE LIPIDS OF THE ALGA *Scenedesmus* DURING BRIEF PHOTOSYNTHETIC EXPOSURES. K. A. Clendenning (Univ. of Chicago). *Arch. Biochem.* **27**, 75 (1950). The tracer carbon found in the benzene-soluble fraction of *Scenedesmus obliquus* after 40-second exposures to $C^{14}O_2$ is incorporated in nonvolatile water-insoluble compounds. After saponification the tracer carbon was found to be quite uniformly distributed between unsaponifiables, fatty acid, and water soluble saponification products. Approximately equal amounts of tracer were recovered in the saturated and unsaturated fatty acid fractions.

SUMMARY OF BIOLOGICAL FAT SYNTHESIS. M. Angermair. *Seifen-Ole-Fette-Wachse* **76**, 24-5, 45-6, 68-9(1950). Review on fat synthesis in animals and plants including microorganisms is given. The technology, composition, and possible uses of the fats are discussed. (*Chem. Abs.* **44**, 6167)

Partition hypothesis for intestinal absorption of fat. I. B. Berry and A. C. Ivy (Univ. of Illinois). *Am. Jour. Physiology* **162**, 80(1950). Samples of emulsified mineral oil ranging in particle size from 200 to 0.2 μ were introduced into the alimentary tract of dogs. No evidence was found that even the most finely dispersed oil was absorbed in significant amounts; there was no chemically detectable loss of mineral oil from the lumen of the intestine, and there was no increase in non-saponifiable material in the thoracic duct lymph.

The unsaturation of fats in foods. P. Desnuelle. *Inds. Agr. et Aliment. (Paris)* **66**, 365-71(1949). A review. In the growing rat, deficiencies of linoleic and arachidonic acids cause skin troubles and stop growth. Vaccenic acid may have biological properties. (*Chem. Abs.* **44**, 5974)

The influence of the intake of coconut oil on calcium balance. V. Sadasivan (Indian Research Fund Assoc., Coonoor). *Current Sci. (India)* **19**, 28(1950). Adult rats showed a positive Ca balance with coconut oil as diet fat. The rat's assimilation of N, Ca, and P was similar whether clarified butter or coconut oil was the diet fat. (*Chem. Abs.* **44**, 5446)

The concentration of tocopherols from natural sources by molecular distillation. J. Green and P. R. Watt (Vitamins Lts. Labs.). *J. Sci. Food Agr.* **1**, 157(1950). Tocopherol concentrates were prepared directly from various seed oils by the use of a laboratory model cyclic falling-film molecular still. From 80-94% of the tocopherols in soybean and cottonseed oils were recovered in the distillate, which had a potency from 14 to 30 mg. tocopherol per g.

Influence of tocopherol on deposition of vitamin A. P. Dubouloz, P. Pistone, and R. Marville (Univ. Marseille, France). *Bull. Soc. Chim. Biol.* **31**, 1273-8(1949). In adult rats the quantity of vitamin A deposited in the liver after ingestion of a single massive dose averaged 22% of the quantity disappearing from the digestive tract when the vitamin was accompanied by natural antioxidants or added tocopherol. It fell to approximately 14% when the vitamin was given in oil free of all antioxidants. (*Chem. Abs.* **44**, 5971)

The estimation of vitamin A in butter. A critical study of methods. A. K. R. McDowell (Dairy Research Inst., Palmerston North, New Zealand). *J. Dairy Research* **16**, 348-55 (1949). The Lovibond Tintometer was found more reliable than either the Pulfrich photometer or the Spekker absorptiometer for the assessment of the blue color from the Carr-Price test on butterfat. By use of a Beckman spectrophotometer vitamin A in butterfat was also estimated by absorption at 324 mμ. From spectrophotometric readings at this wave length and at 450 mμ the absorption due to carotenoids and noncarotenoids can be calculated. Comparison of the butterfat samples by the Carr-Price test and by the direct spectrophotometric method shows a reasonably good agreement. (*Chem. Abs.* **44**, 5490)

Estimation of vitamin A in the presence of interfering materials. W. A. McGillivray (Univ. N. Zealand, Palmerston North). *Anal. Chem.* **22**, 494(1950). Extinction coefficients are determined spectrophotometrically at 325 (maximum absorption), 310, and 340 mμ. An equation is developed which permits calculation of the extinction coefficient for vitamin A alone, provided the points on the curve corresponding to the interfering substances alone lie in a straight line. This proviso generally applies over the narrow wave band considered. The wave length at which readings are taken and their interpretation will depend on the solvent and on whether the vitamin A is esterified or not. (*Chem. Abs.* **44**, 5423)

Microdetermination of vitamin A by means of trichloroacetic acid reagent. G. Nogrady. *Magyar Orvosi Arch.* **45**, 135-46(1944). The micro method described is based on the Carr-Price reaction. Trichloroacetic acid is used in place of $SbCl_3$. This reaction is more specific and less sensitive to water, and its blue color shows only a slow decrease of intensity. (*Chem. Abs.* **44**, 5415)

Determination of polyunsaturated fatty acids in blood. P. W. O'Connell and B. F. Daubert (Univ. of Pittsburgh, Pittsburgh, Pa.). *Arch. Biochem.* **25**, 444-6(1950). Linoleate in beef plasma was determined by extracting the total lipid of the plasma, saponifying it, subjecting it to alkali isomerization, and reading absorption at 233 mμ in absolute methanol. Corrections for other lipids must be made. (*Chem. Abs.* **44**, 5945)

Nature of end lactation milk fat. T. M. Paul and C. P. Anantakrishnan (Indian Dairy Res. Inst., Bangalore). *Indian Jour. Dairy Sci.* **2** (2), 58-64 (1949). Samples of butterfat were collected from animals in an advanced stage of pregnancy and classified as "dry." The fat % of milk samples varied from 2.3 to 16. A gradual decrease in the Reichert and saponification values and an increase in the iodine value occurred with the advance in pregnancy. No consistent changes were noted in the Polenske values. (*Biol. Abs.* Sect. G., **24**, 32)

The Adriatic elasmobranchia liver oils. IV. Biochemical study of oils from the liver and eggs of Centrina salviani. S. Cmelik (Inst. Oceanograf. I Ribarstvo U Splitu, Jugoslavije). *Acta Adriat.* **4**, 3-23(1949). Liver oils from this species were compared as to physical and chemical properties, as were oils from fertilized and unfertilized eggs. Chemical properties of fat acids from all these sources were quite similar. Chromatographic absorption on Al_2O_3 was partially successful in separating components of the unsaponifiable material, cholesterol, selachyl, batyl, and chimyl alcohols being identified. The unsaponified portion of egg oil contains much more cholesterol than does the liver oil. The oil from fertilized eggs shows a great decrease in percentage of unsaponifiables, free fat acids, total fat acids, saponification no., and I no. from that of unfertilized eggs. (*Chem. Abs.* **44**, 5619)

• Waxes

E. H. McMullen, Abstractor

Physical and technical properties of hydrocarbon waxes, their classification, and nomenclature. Karl H. Grodde (Deut. Erdöl A.-G., Chem. Abt. Mariendorf, Berlin). *Erdöl u. Kohle* **3**, 61-72(1950). Formulas are given for the calculation of the molecular weight of paraffins as a function of solidification point, density, refractive index, viscosity (Walther's expression), boiling point, and for the calculation of vapor pressures. By substituting "asymmetry" and "ring" values, the above formulas can be applied to iso- and ring paraffins (ceresin). The application of these formulas to waxes of dissimilar composition is discussed with particular reference to behavior of the solidification point. A practical measure of composition is found to be the mean slope of the distribution curve versus solidification point. Dichloroethane is used for fractionation, and data show the influence of dilution on separation. For high-melting waxes a "turbidity point" is used as criterion for determining composition. The oxidizability in air of paraffins and isoparaffins is the same; however ceresins are much more resistant towards oxidation. A classification and nomenclature for waxes are presented and the analytical procedures for the classification described (*Chem. Abs.* **44**, 5573)

Synthetic waxes. III. E. E. Halls. *Food* **19**, 108-10(1950). Groups of synthetic waxes of interest to the food industry are described, and their physical and chemical properties are tabulated. (*Chem. Abs.* **44**, 5485)

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Extraction of unsaponifiables from wool grease. Archie B. Porter (NOPCO Chemical Co.). *U. S. 2,499,877.* Wool grease (solvent-extracted or acid-cracked grade) is saponified with a 4-200% excess of alcoholic alkali, the saponified mass is partially neutralized with mineral acid to a pH of 8.5-11.0, and the mixture is extracted with a halogenated hydrocarbon solvent, preferably dichloroethane. Sterols and other unsaponifiables are recovered quantitatively. (*Chem. Abs.* **44**, 6176)

Emulsions of thermoplastic resins, waxes, and oils. James K. Dixon and Russell L. Morgan (American Cyanamid Co.). *U. S. 2,500,122.* Emulsions of resins, waxes, and fatty oils are prepared in aqueous organic solvent mixtures by use of a cationic amido compound as emulsifying agent. Examples of resins are alkyds, butylated melamine-formaldehyde condensates, butylated urea-formaldehyde, and rosin-fumaric acid adduct. Examples of waxes are carnauba wax and paraffin. Examples of emulsifying agents are (3-stearoylaminopropyl)-, (3-lauroylaminopropyl)-, and (3-oleoylaminopropyl(dimethyl-(2-hydroxy-ethyl)ammonium chloride, (3-stearoylaminopropyl) dimethyl(2,3-dihydroxypropyl)ammonium chloride, and the reaction product of (3-stearoylaminopropyl)dimethyl-ammonium chloride with 20 molecules of ethylene oxide. (*Chem. Abs.* **44**, 6176)

Polyethylene wax compositions. Frederick H. MacLaren and John A. Anderson (Standard Oil Co. of Indiana). *U. S. 2,504,270.* Increased tensile strength is given to petroleum wax by the addition of very small amounts of high-molecular ethylene polymers. (*Chem. Abs.* **44**, 6114)

Polyethylene waxes. Michael Erchak Jr. (Allied Chemical and Dye Corp). *U. S. 2,504,400.* Synthetic hard, high-melting wax of the formula $Me(C_2H_4)_nC(OH)Me_2$ is prepared by polymerizing ethylene of at least 90% purity containing less than 0.01% by weight oxygen at 140-200° and 6,500 lb./sq. in. pressure in the presence of 0.1-2.0% hydrogen peroxide and an amount of isopropanol corresponding to 5-10% of the volume of the reaction zone. The wax produced has penetration of 1 to 3 at 22°C. under a load of 200 grams; the melting point ranges from 105° to 115° depending on the reaction conditions. Temperatures above 165° and high hydrogen peroxide concentration favor production of softer wax while the wax obtained at lower temperatures and hydrogen peroxide concentration and high isopropanol concentration is hard. (*Chem. Abs.* **44**, 5622)

Aqueous wax emulsion. A. F. Buckman Jr., and Margaret M. Rendall (S. C. Johnson and Son Inc.). *U. S. 2,504,920.* An aqueous wax emulsion suitable for making asbestos-cement building boards water-repellent is prepared by heating to 190°F. a mixture of stearic acid 24.1, yellow carnauba wax 2.8, polybutene (molecular weight 940) 10, morpholine 3.5, 26° Bé., ammonium hydroxide 4 parts, and enough water to bring the water content to 94 parts. For treatment of the boards, 1 part aqueous emulsion is mixed with titanium dioxide 0.25, and water 24 parts. Polybutene of higher and lower molecular weight can also be used. (Chem. Abs. **44**, 5622).

• Drying Oils

Robert E. Beal, Abstractor

Formation of bodied linseed oil. M. Kronstein, M. M. Ward, S. S. Morris, and D. Mishkind (New York Univ., New York, N. Y.). *New York Univ. Coll. Eng., Symposium on Varnish and Paint Chem.* **1948**, 77-88. Diffraction x-ray spectra and ultraviolet spectrographic tests will reveal approaching gelation. The latter shows a rapid shifting between wave lengths of 310-265 millimicrons as the raw oil is bodied. (*Chem. Abs.* **44**, 5609)

Maleate oils—modifications of drying oils with maleic acid derivatives. C. P. A. Kappelmeier, J. H. van der Neut, and W. R. Van Goor. *Kunststoffe* **40**, 81-7(1950). In the reaction of maleic acid with simple olefins a "substituent addition" takes place at the α-methylene group which leads to the formation of alkenyl-succinic acid anhydrides. If several double bonds exist in the molecule, conjugation tends to occur. Maleate oils body fast at high temperatures, and their films through-dry well and are water- and weather-resistant. (*Chem. Abs.* **44**, 5609)

Isomerization of drying oils. M. C. deWilde. *Ind. Chim. belge* **15**, 72-9(1950). A review with 40 references.

Improving drying properties of soft oils. H. L. Rice. *Paint Varnish Production* **30**, No. 2, 13, 15-17(1950). Copolymerization of domestic oils with heat-reactive "Carbic" anhydride resins gives products which are fast-bodying, dry rapidly, through-dry well, improve the hardness of phthallic alkyds, and may replace China wood oil. The use of polyhydric alcohols of higher functionality than glycerol to improve domestic oils is reviewed. (*Chem. Abs.* **44**, 5116)

Modified oils. H. A. Boekenoogen. *Verfkroniek* **23**, 77-80 (1950). Improvement of natural drying oils by the removal of antioxidants, coloring matter, and other undesirable materials is reviewed. A new process of isomerization which gives 50% conjugation with linseed oil is described. The oil polymerizes in 6% of the time for ordinary linseed oil and gives films which show no after-tack. (*Chem. Abs.* **44**, 5609)

On the drying of linseed oil. R. Dooper. *Verfkroniek* **23**, 84(1950). The chemical and physical properties of samples of poor drying and samples of good drying linseed oil were determined, but no differences were detected other than in drying time.

Experiments in the drying of graphic colors. R. Beuerle and M. Hartmann. *Angew. Chem.* **62**, 143-4(1950). Light, especially ultraviolet, and O accelerate the drying of linseed oil, with and without the use of driers. Drying in the presence of carbon dioxide or moisture is slower. (*Chem. Abs.* **44**, 5608)

Some practical tests with isomerized oils. H. W. Talen. *Verfkroniek* **23**, 80-2(1950). The properties of linseed oil isomerized by a new process are compared with ordinary linseed oil and tung oil both bodied and unbodied. The isomerized oil has better water resistance and lies between linseed and tung oils in drying time, chalking, and in scorch tests. (*Chem. Abs.* **44**, 5610)

Application of infrared spectroscopy to the study of drying oils and certain plastics. M. Kronstein. *New York Univ. Coll. Eng., Symposium on Varnish and Paint Chemistry* **1948**, 13-40. With this method the most noticeable change when linseed oil was converted to an insoluble, infusible substance was in the region between 1000 and 1150 cm,$^{-1}$ and it shows that the insoluble product is still oil substance. Similar changes were noted with other oils. Although the spectra of monomeric styrene and linseed oil were completely different, those of solid polystyrene and of the polymer produced from liquefied gelled linseed oil and styrene at 50° showed that similar infrared shiftings had occurred. The insoluble form appears to have its own spectral, chemical, and physical properties. (*Chem. Abs.* **44**, 5608)

Analysis of dehydrated castor oil. D. O. Bartl. *Chem. Listy* **37**, 98-102, 109-12(1943). Correct values for the I value (Hanus) require 400% excess IBr. As dehydration proceeds, the I value increases to a constant final value of 148 after 6-8 hours and the hydroxyl number decreases gradually. The discrepancy is explained by condensation reactions. (*Chem. Abs.* **44**, 5617)

Systematic fractionation of bodied linseed oil (standoil). J. Petit (French Paint and Varnish Research Lab., Paris). *New York Univ. Coll. Eng., Symposium on Varnish and Paint Chem.* **1948**, 71-6. Fractionation with alcohols of varying molecular weights gives evidence of the heterogeneity of bodied oils. (*Chem. Abs.* **44**, 5609)

Turkish tobacco-seed oil. S. L. Alpar and S. Esin (Univ. Istanbul). *Rev. faculte sci. univ. Istanbul* **14A**, 65-71(1949). The oil had I value of 140, saponification value of 187, unsaponifiable content of 2.1% solid fatty acids 8.0%, liquid fat acids 82%, and linoleic acid content of 68.5%. The oil films dried within 5-8 days in sunlight and in 1-2 days when mixed with red lead. (*Chem. Abs.* **44**, 5619)

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Treatment of hydrocarbon drying type drying oils to effect an improvement in their drying qualities. E. M. Geiser (Universal Oil Products Co.). *U. S. 2,513,558.* A hydrocarbon drying oil boiling below 250°, recovered from polymerization sludge, is contacted at reaction conditions which maintain the reactants in liquid phase, with BF_3 hydrate or with a BF_3 complex with an O-containing organic compound, and an improved drying oil is recovered from the sludge thus formed.

Coating compositions. D. S. Breslow (Hercules Powder Co.). *U. S. 2,515,290.* The composition comprises a pentaerythritol ester of a dehydroabietyl N-substituted carbamic acid and a drying oil.

Process for obtaining bodied drying and semidrying oils. B. C. Pratt (E. I. duPont deNemours and Co.). *U. S. 2,516,590.* A catalyst used in amounts of 0.1-2.0% for bodying drying oils at 250-350° consists of a resin which is the reaction product of sulfur dioxide and an organic compound containing a carbon to carbon double bond.

Method of treating tall oil. J. J. Smerechniak and G. W. Barlow (American Cyanamid Co.). *U. S. 2,515,739.* The color and odor of tall oil fatty acids are improved by heating them with 0.1-2.5% of metallic Zn at 150-275°.

Continuous process for the dehydroxylation of castor oil. S. B. Radlove (The Maytag Co.). *U. S. 2,515,797.* The oil is mixed with 0.1-1.0% of 70-90% sulfuric acid and allowed to flow by gravity in a thin film over a heated surface where it is heated to 240-400° and continuously subjected to a vacuum for the removal of volatile material.

• Detergents

Lenore Petchaft, Abstractor

Solubilization of protein-dye precipitates. J. C. Perrone (Inst. nacl. technol., Rio de Janeiro). *Rev. brasil. biol.* **9**, 425-6(1949) (in English). The precipitates formed upon addition of various cationic dyes to a slightly alkaline solution of egg albumin redissolve when a soap or an anionic alkyl sulfate detergent is added. Cationic and nonionic detergents have no such action. The soaps and anionic detergents form soluble nondialyzable complexes with the dyes. (*Chem. Abs.* **44**, 4525)

The aging of colloids. W. Kopaczerski. *Chimie & industrie* **63**, 27-33 (1950). The changes in the properties of colloidal systems with time are attributed to the degree of dispersion, which determines the stability. The stability of the system in turn depends on its sensitivity to light, its oxidation-reduction tendency, its catalytic character, its degree of transparency, and its chromogen properties. The theory is applied to the aging characteristics of glass, gelatin, gums, soaps, greases, and other industrial products. The possible importance of the electrical potential of the air, cosmic rays, and magnetic storms is indicated. (40 references.) (*Chem. Abs.* **44**, 4751)

Importance of anhydrous phosphates for the soap and detergent industry. Kurt Lindner (Berlin-Lichterfelde-Ost, Ger.). *Seifen-Ole-Fette-Wachse* **76**, 133-6(1950). Review on the chemistry of anhydrous phosphates, their influence on water hardness, their practical importance, and the influence of Na hexametaphosphate on surface activity. (*Chem. Abs.* **44**, 6171)

WATER-SOLUBLE CELLULOSE ETHERS AS EMULSIFYING AGENTS. R. I. Morrison and B. Campbell (Imperial Chem. Inds. Ltd., Stevenston, Aryshire, Scot.). *J. Soc. Chem. Ind. (London)* **68**, 333-6(1949). Methylethylcellulose (I) is a more effective emulsifier in a lower concentration than Na carboxymethylcellulose (II). A mixture of both is better than either alone. The presence of a high-viscosity II reduced the tendency of I to foam. I reduced the interfacial tension between H_2O and liquid paraffin much more than did II. In a concentration of 0.5%, I showed 25.3 and II 47.5 dynes/cm. I cannot be used over 40° since its solubility is much reduced with increase in temperature. However an emulsion first made was stable at 45°. Emulsions made with I were stable over the range of pH 2-10 whereas at an acid pH emulsions with II break down. (*Chem. Abs.* 44, 6662)

THE INFLUENCE OF SODIUM CARBOXYMETHYL CELLULOSE ON THE SUSPENDING POWER OF BUILT SOAP SOLUTIONS. C. H. Bayley and A. S. Weatherburn (National Research Labs., Ottawa, Canada). *Textile Research J.* **20**, 510-13(1950). The influence of sodium carboxymethyl cellulose (CMC) on the ability of soap solutions to prevent the deposition of carbon black on fabric during the detergent process has been studied. It was found that the presence of alkaline builders (sodium carbonate, modified soda, sodium metasilicate, and sodium orthosilicate) resulted in a decrease in the suspending power of soap solutions. The addition of CMC to such built soap solutions compensated to a considerable extent for this reduction in suspending power caused by the builder although in no case did the suspending power equal that of the unbuilt soap. The maximum improvement in suspending power was obtained with a CMC concentration of 0.005% e.g., 5% of the weight of soap used. In general, those builders which caused the greatest depression in the suspending power of the soap solution also showed the greatest improvement in suspending power on the addition of CMC.

SOME PHYSICAL-CHEMICAL ASPECTS OF COTTON DETERGENCY. CATIONIC ADSORPTION AND EXCHANGE AS SHOWN BY RADIOCALCIUM TRACER STUDIES. J. M. Lambert (General Aniline and Film Corp., Easton, Pa.). *Ind. Eng. Chem.* **42**, 1394-8(1950). Some of the physical-chemical properties of cotton responsible for the complex interactions in practical detergency have been reviewed. The accessibility and acidic characteristics of cotton appear to be of particular importance. The role of adsorption as an important factor in detergency is illustrated by experimental adsorption data of surface-active agents on cotton. Radioisotope tracer methods are described for measuring the adsorption and exchange of calcium on cotton as it occurs in laboratory wash tests simulating hard water laundering. Results are presented which were obtained with several cotton detergents in multicycle wash tests. Varying amounts of calcium are adsorbed depending on the detergent and on the condition of the cloth (new or used cotton). A tentative interpretation of these effects is offered as well as a discussion of possible extensions of the method.

METHODS OF EVALUATING DETERGENTS. Cornelia T. Snell (Foster D. Snell Inc., New York, N. Y.). *Am. Dyestuff Reptr.*, **39**, 485-7(1950). General review article covering types of detergents and the methods available for evaluating their efficiency. Methods include: surface tension measurement, interfacial tension measurement, measurement of dispersing power, measurement of wetting power, and washing tests.

COTTON AND LINEN FABRICS: EFFECTS OF LAUNDERING. Sigurd Kohler. *Tvatt-Tidningen.* **1949**, No. 9, 1-12. Investigations have been carried out on the influence of the quantity of alkali, the maximum temperature and the time during which the maximum temperature is maintained, on the strength, loss of weight, ash content, and whiteness of cotton and linen fabrics after 50 and 100 washings. Strips (cut in warp and weft directions) of bleached cotton and linen were used and washed in one series of experiments with high-titre soaps and in another series with low-titre soaps. In each series different quantities of sodium hydroxide or sodium carbonate were used, and the maximum temperature and the time of washing at that temperature were also varied. Data are presented graphically and in tables. The results are discussed and their application to the practical laundering of cotton and linen goods is indicated. (Textile Research J. Abstracts **20A**, 311)

HOW SODIUM SALTS WORK IN DETERGENTS. Wm. W. Niven Jr., and Howard Gadberry (Midwest Research Institute, Kansas City, Mo.). *Chem. Ind.* **67**, 61-4, 66, 68(1950). A review of the chemical properties of various sodium salts which are used as soap and detergent builders including hydrolysis, sequestering power, surface activity, foaming ability, and effect on the soap or detergent in question. Emphasis is placed on care of choosing proper builder for particular conditions so that detergency is enhanced and soil redeposition is prevented. Requirements and formulas are given for such products as household soaps, hand dishwashing compounds, automatic dishwashing compounds, floor cleaners, dairy detergents, bottle washing compounds, and metal cleaners.

STRUCTURE OF AQUEOUS SOLUTIONS OF SOAPLIKE SUBSTANCES. G. S. Hartly. *Ann. Repts. Progress Chem. (Chem. Soc., London)* **45**, 33-51(1948). Review with many references. (*Chem. Abs.* **44**, 5681)

FOAM STUDIES WITH SOAPS AND TEXTILE AUXILIARIES. Ernst Gotte. *Melliand Textilber.* **29**, 65-9, 105-8(1948). The physics of frothing and techniques for measuring foaming power are discussed. Measurements were made with a jacketed, graduated glass cylinder. Air was introduced through fine openings in the bottom of the cylinder, and a means for agitating the liquid was provided. A study was made of homologous series of the types RSO_4Na, RSO_3Na, and RCOONa. The minimum concentration for foam formation is independent of temperature but decreases as the chain length increases. The foaming rate increases with temperature. For each material there is an optimum concentration for foam formation which is dependent upon the chain length. The half-life of the foam increases with chain length to a maximum at C_{17}. The foaming power of the RSO_4Na series is superior to the other two types. (*Chem. Abs.* **44**, 6660)

APPLICATION OF NEW EXPERIMENTAL METHODS TO THE STUDY OF SURFACE-ACTIVE COMPOUNDS. Madeleine Raison and Raphael Matalon. *Mem. services chim. etat (Paris)* **34**, 353-71(1948). Some industrial chemicals were studied to determine their activity at the interfaces. Tension measurements were made with a wire loop and wettability was determined by studying drops on a surface. The measure of wettability is given in the coefficient of spreading S/V. This coefficient gets larger as the surface tension is lowered, increasing abruptly at the concentration that gives minimum surface tension. Foaming was studied with the laminometer and is produced at concentrations much lower than those that give minimum tension. The volume of foam increases sharply at minimum surface tension. The foaming power is related to the molecular constitution of the molecules of the detergents. (*Chem. Abs.* **44**, 5678)

THE PREPARATION OF LIME- AND ACID-RESISTANT WASHING, DISPERSING, AND WETTING AGENTS FOR THE TEXTILE INDUSTRY. Walter Riess. *Seifen-Ole-Fette-Wachse* **76**, 103-4(1950). Secondary alcohols are prepared from the ketones obtained by the distillation of low-molecular weight fatty acids (butyric, caproic, and caprylic acids) over catalysts. These alcohols are condensed with benzene, naphthalene or phenol, and oleum or $ClSO_3H$ at 30-40° to yield true sulfonic acids. (Chem. Abs. **44**, 6172)

SULPHATED PRIMARY FATTY ALCOHOLS. A. R. Keast. *Perfumery Essent. Oil Record* **41**, 223-6(1950). Review article covering methods of producing fatty alcohols, production of the sulphate useful as a detergent, summary of such properties as detergency, foaming power and emulsifying power, and a survey of the various uses of these fatty alcohol sulfates.

USES OF STARCH AS A SOAP FILLER. Paul I. Smith. *Am. Perfumer Essent. Oil Rev.* **56**, 51-2(1950). Up to 20% starch may be used as a soap filler. It does not affect detergency and produces a smooth bar and shiny lather. It is possible that the beneficial action of starch can be attributed to its colloidal and gel-forming character. Starch helps mask alkalinity and prevent rancidity but may tend to discolor white soap.

ANALYSIS OF SOAP STOCKS. J. P. Wolff. *Bull. mens. ITERG* **4**, 165-8(1950). A mixture of 67% dioxane and 33% of H_2O is an excellent solvent which prevents emulsions upon extraction of the neutral fat with petroleum ether and eliminates the danger of a possible hydrolysis if, previous to the determination of total fat, HCl, is used for the decomposition. Volumetric methods are discussed but recommended only for very pure soap stocks. (*Chem. Abs.* **44**, 6171)

DETERMINATION OF SILICATES IN LAUNDERING COMPOUNDS. W. Gottschaldt. *Fette u. Seifen* **51**, 432(1944). For a speedy gravimetric determination of SiO_2, a 2-g. sample is mixed with 1.5-2.0 g. NH_4Cl, 15 ml. concentrated HCl is added slowly, the mixture is heated 10 min. on the steam bath, diluted with 50 ml. boiling H_2O, filtered, and the precipitate ignited. In the absence of phosphates a colorimetric method using the color reaction with ammonium molybdate is suggested. (*Chem. Abs.* **44**, 6662)