Application

The suggested modifications in procedure and apparatus described have been successfully applied for several years in our laboratory. They have proved satisfactory in the analyses of all types of detergents, anionic, cationic, nonionic, and in all types of mixtures and blends. Determining CO_2 accurately in many of these substances was practically impossible before the above modifications were introduced.

Summary

The suggested modifications make it possible to adapt the original method of Hitchcock-Divine to alkyl benzene sulfonates and similar types of synthetics which cannot be hydrolyzed. Alcohol instead of water solutions of the sample are used to eliminate foaming. An electric mantle, a CO_2-free stream of steam, or both can be used to prevent the solutions from "bumping" while boiling under vacuum.

[Received March 21, 1950]

ABSTRACTS . . . . Don Whyte, Editor

• Oils and Fats

R. A. Reiners, Abstractor

Studies on Indian edible oils. Groundnut oil. K. Ramamurti and B. N. Banerjee (Indian Inst. Sci., Bangalore). *Indian Jour. Med. Res.* 36 (4), 371-386(1948). Studies on market samples of groundnut (peanut) oil showed that a majority had a high F.F.A. content due to non-grading of the seeds before crushing. No direct relationship exists between color and F.F.A. although samples of high F.F.A. also show darker color. Free fatty acidity lowers the induction period, hydrolysis by pancreatic lipase, and the stability of carotene and vitamin A in peanut oil. Refining does not improve the induction period of high acid oil. Peanut oil of more than 1% F.F.A. is not well suited for storage or digestion. (*Biol. Abs.* Sect. G 24 [4], 23)

Production of oil from plum seeds. L. Hasko. *Mezogazdasag es Ipar* 2 (11), 27-8(1948). Seeds of *Prunus domestica* were disintegrated, the hard shell particles removed by flotation in a 20% solution of NaCl and the soft kernel processed as usual in sunflower-seed-oil mills. The oil had the following contents: acid no. 1.0, saponification no. 190.1, iodine no. 110.2, unsaponifiable 0.4%, solidification temperature of fatty acid, 6.4°. No toxic effects of the oil were observed in cooking. (*Chem. Abs.* **44**, 5121)

The composition and properties of the oil from the seeds of red currant (*Ribes rubrum* L.). J. Koblic. *Chem. Obzor* **24**, 118-21, 129-32(1949). The oil is clear, golden yellow, has a slightly varnish-like odor and a slightly fishy flavor, m. 9.3°, acid value 0.55%, saponification no. 192.3, iodine no. (Hanus) 154.0, unsaponifiable matter 1%. The fat acids have iodine no. 145.1, m. 19.5°, solidify 9.5°, neutralization no. 200.9, hexabromide no. as linolenic acid 2.58%. (*Chem. Abs.* **44**, 5120)

Hydrogenated whale oil. Its industrial uses. P. Merat. *Oleagineux* 4 (4), 203-212(1949). A review of the literature on the production of hydrogenated whale oil and its uses in the soap, margarine, and stearine industries. (*Biol. Abs.* Sect. G. 24 [4], 22)

Chemical examination of the fixed oil of *Artemisia scoparia*. D. B. Parihar and S. Dutt (Delhi Univ., Delhi). *Indian Soap J.* **15**, 161-5(1950). The scoparin and essential oil were removed from the air-dried flowering heads of the plant, and the residues were extracted with ethyl ether. A highly viscous, greenish fatty oil was obtained in 4.45% yield. The refined oil had the following characteristics: m.p. 49-51°, saponification value 192.4, iodine value 30.3, acetyl value 4.28. The oil contained the following fatty acids: myristic 5.1, palmitic 23.5, stearic 24.4, arachidic 18.0, linoleic 11.2, and oleic 10.1%. The unsaponifiable matter (2.1%) was composed of sitosterol 19.8% and hydrocarbon ($C_{34}H_{70}$) 80.2. (*Chem. Abs.* **44**, 5121)

Vegetable oils and their dependence on climate and soil. I. Oil of *Camellia japonica*. R. Dios and Maria G. Vieitez. *Anales Edafol. Y Fisiol. Vegetal (Madrid)* **8**, 791-810(1949). The oil content of seeds grown in Galicia was approximately that found by Japanese investigators in the tropics but was less than values from seeds grown in Germany. The iodine no. and m.p. approximated the minimum values for the oil shown by other investigators under different ecological conditions. The values for unsaponifiable fraction were approximately double those found elsewhere. (*Chem. Abs.* **44**, 5119)

Unusual plant oils for food purposes. O. A. F. Gnadt. *Pharm. Ztg.* **86**, 51(1950). The use of tobacco-seed oil and cold-pressed oil from *Datura stramonium* is discussed. The latter contains no alkaloids and has the following constants: acid no. 8.1, saponification no. 191.3, and iodine no. 106.4. (*Chem. Abs.* **44**, 4268)

Oil content of grape seed of the principal cultivated varieties and optimum conditions for obtaining oil. S. Gogalniceanu and E. Negreanu. *Analele Inst. Cercetari Agron. Romaniei* 15, 121-38(1943). The seed of Romanian grapes averaged 14.2% oil. Seed of red varieties were lower in oil content than the white. Petroleum ether was found to be a satisfactory extraction solvent. (*Chem. Abs.* **44**, 5120)

Gossypol content of cottonseeds of Belgian Congo and of their by-products. G. Neirinckx. *Bull. Agr. Congo Belge* 39, 819-40(1948). Average gossypol content is in seeds 0.92, in kernels 1.48, and in cake 0.84%. (*Chem. Abs.* **44**, 5121)

Hydrogenation of oils. R. C. Galan. *Ion* **9**, 580-90(1949). Industrial hydrogenation of oils are described. (*Chem. Abs.* **44**, 4267)

New improved method of extracting fat from cheese, fresh curd, and milk for fat acidity determination. J. F. Bowen, E. G. Hood, and C. A. Gibson (Central Expt. Farm, Ottawa, Canada). *Sci. Agric. (Ottawa)* 29 (11), 551-552(1949). For the determination of fat acidity as an indication of the development of bacterial rancidity during making and curing of experimental Cheddar cheese, clear dry milk fat may be obtained by the methods described. For cheese milk a sample of the milk is churned and the fat, obtained as butter granules, melted and clarified by decanting and filtration. For raw curd, a sample is ground with boiling water in the Waring blendor, allowed to stand several hours at 0°F., the fat layer skimmed off, transferred to an Erlenmeyer flask, and churned by shaking. The fat is clarified by melting, decanting, and filtration. For maturing cheese, the sample is ground dry in the Waring blendor, allowed to oil off in beakers set in the boiling water bath, and the fat clarified by filtration. Bacterial changes in the milk fat between sampling and analysis are considered to be reduced to a minimum by these methods. (*Biol. Abs.* Sect. G. 24 [3], 31)

Micro-determination of erucic acid in fats and oils. G. Gorbach and H. Malissa. *Mikrochem. ver. Mikrochim. Acta* **33** (4), 365-367(1948). Erucic acid was determined in 20 mg. of oil or fat by using Gorbach's micro-instruments in the macro-method of Kaufman and Fiedler. (*Biol. Abs.* Sect. G. 24 [4], 22)

A new distilled red oil. Anon. *Rayon and Synthetic Textiles* 31 (6), 77(1950). A highly purified distilled red oil is now being produced commercially with a maximum color of 10Y-1R (Lovibond).

Shortening for frying and baking. S. W. Arenson (Doughnut Corp. of America). *Food Industries* 22 (6), 65(1950). The shortening characteristics required for best results in frying doughnuts, potato chips, and nuts are discussed. Recommendations are made regarding the best types of shortening for bread and cake.

Preservation of lard. E. Sandell and Birgitta Spross (Farmacevtiska Inst., Stockholm). *Svensk Farm. Tid.* **54**, 61-73(1950). Pure lard with a low initial peroxide number was protected against oxidative rancidity for one year by use of 0.003% hydroquinone or nordihydroguaiaretic acid or 0.006% propyl gallate. The stabilizing effect was proportional to the amount of antioxidant added in the range of 0.003-0.03%. Benzoin and gum guaiac protected lard in a concentration of 0.3%. Diphenylamine, hydrogenated peanut oil, and α-tocopherol showed only feeble antioxidant activity in the accelerated tests and α-tocopherol increased the oxidation in the storage tests. A synergistic effect with 0.75% citric acid was observed with N.D.G.A. and hydrogenated peanut oil and with α-tocopherol only in the accelerated tests. (*Chem. Abs.* **44**, 4599)

THE PRESENT WORLD PROBLEM OF FATS. M. Cepede. *Bull. Soc. Sci. Hyg. Aliment.* **36** (7/8/9), 211-224(1948). A review covering both food and industrial fats. (*Biol. Abs.* Sect. G. **24** [3], 25)

THE BITTER SUBSTANCE OF RAPESEED. P. Schwarze. *Naturwissenschaften* **36**, 88-9(1949). The bitter material in rapeseed cake, fluorescing blue in acid, green in alkaline solution, was identified as sinapine. The sinapine content of the seeds varies from 0.78 to 1.33%. (*Chem. Abs.* **44**, 4268)

THE MECHANISM OF ELECTRICAL POLYMERIZATION AND THE CONSTITUTION OF ELECTRICALLY POLYMERIZED GLYCERIDES. L. Yzu and A. Vian. *Combustibles (Zaragoza)* **8**, 201-9(1948). Linseed, olive, and palm oils were subjected to the action of a silent electrical discharge in an inert atmosphere for periods up to 50 hrs., at energy consumption up to 3.5 kw.-hrs./1. Untreated linseed oil contained 0.52 dienes, 0.1 trienes, and 0.11% tetraenes; after consumption of 3.25 kw.-hrs./1, 7.22 dienes and 0.35% trienes. Olive and palm oils after electric treatment contained 3.3 and 0.64% dienes, respectively. The electrically induced polymerization is considered to take place as a result of the formation of radicals and conjugated double bonds. (*Chem. Abs.* **44**, 4696)

THE RAMAN ANALYSIS OF UNBRANCHED AND BRANCHED HYDROCARBON CHAINS AND ITS USE IN INVESTIGATING FATTY ACIDS. H. Luther and H. Berge (Tech. Hochschule, Braunschweig, Ger.). *Brennstoff-Chem.* **31**, 42-7(1950). A method has been developed for the determination of the isomer configuration and of the percentage of straight-chain hydrocarbons in simple mixtures of straight-chain hydrocarbons with those with 2- or 3-methyl side chains, but of the same chain length up to C_{18}, by means of the Raman effect. For less well-defined mixtures, semi-quantitative results are secured. Use is made of the specific branching number, or the equivalent number of side chains of a molecule averaging 10 C atoms. Fractions of synthetic fatty acids up to C_{12} were investigated qualitatively and quantitatively by Raman spectrographic methods. In mixtures of fatty acids up to C_9 predictions can be made as to the structure of all of the iso acids present; for higher molecular weight acids (up to about C_{12}) only group predictions can be made since the analyses must be made in a solvent, preferably benzene. (*Chem. Abs.* **44**, 4416)

PHYSICAL STRUCTURE OF BUTTER. N. King and W. Fritz. *Milchwissenschaft* **3** (2), 36-41(1948). A technique is detailed for observing, counting, and measuring the fat globules in butter under polarized light after thinning with butter oil at 14-16°. (*Biol. Abs.* Sect. G. **24** (3), 31)

MEASUREMENT OF THE VISCOSITY OF GLYCEROL AT HIGH TEMPERATURES. V. Vand. *Research (London)* **1**, 44-5(1947). The viscosity of glycerol was determined at 80-167° and an empirical formula derived from the results correlating viscosity with water content and temperature. (*Chem. Abs.* **44**, 4742)

THE CANADIAN OIL CRUSHING INDUSTRY. S. R. Steinback. *Can. Chem. & Proc. Ind.* **34**, 501(1950). An excellent market for oil exists in Canada but only a limited and declining market for feed. Industry concentrates heavily on flax and soybean processing and consequently is too dependent economically on feed prices. Mills should be set up to handle a variety of oil bearing materials particularly those of high oil content.

COMPONENT FATTY ACIDS OF ELEPHANT SEAL OIL. G. Winter and W. Nunn (Defence Research Labs., Maribyrnong, Victoria, Australia). *J. Sci. Food Agr.* **1**, 18-21(1950). Analyses of the blubber fat of the elephant seal, *Mirounga leonina*, were carried out. (*Chem. Abs.* **44**, 4695)

CASE OF DETERIORATION OF FAT DURING PROLONGED STORAGE. V. Petrovskii. *Myasnaya Ind.* **20** (6), 36-9(1949). Deterioration by hydrolysis and oxidation is discussed. (*Chem. Abs.* **44**, 5119)

NOTES ON THE PREPARATION OF MONOGLYCERIDES AND MONOESTERS OF POLYHYDRIC ALCOHOL. P. Savary. *Oleagineux* **4** (3), 155-159(1949). A method is given for calculating the composition of the reaction products formed by reaction of fatty acids with poly-alcohols in which all of the hydroxyl groups are not esterified. (*Biol. Abs.* Sect. G. **24** [4], 23)

INCREASE SHELF LIFE OF CRACKERS MADE WITH LARD. Anon. *Food Processing* **11** (7), 20(1950). Crackers made with lard inhibited with t-butyl hydroxyanisole are shown to have improved shelf life.

STUDIES ON THE EMULSIFICATION OF VEGETABLE OILS BY ULTRASONIC WAVES. A. Audouin and G. Levavasseur. *Oleagineux* **4** (2), 95-100(1949). Different factors influencing the formation and breaking of water in oil or oil in water dispersions, such as ultrasonic energy, frequency, emulsifiers, etc., are reviewed. (*Biol. Abs.* Sect. G. **24** [4], 22)

EXAMINATION OF OILS FOR THE NORWEGIAN CANNING INDUSTRY IN THE YEAR 1949. O. A. Ronold and T. Taarland (Norwegian Can. Ind., Stavanger). *Tids, Hermetikind.* **36**, 138-40 (1950). Analyses of 110 oils are given. (*Chem. Abs.* **44**, 4269)

THE IRON AND COPPER CONTENTS OF SAMPLES OF BELGIAN BUTTER. P. Jamotte (Station laitiere etat Gembloux, Belg.). *Proc. 12th Intern. Dairy Congr. (Stockholm)* **2**, 183-90(1949). Samples from 65 dairies had an Fe content of 350-5000 γ/kg., and Cu content of 55 to 950 γ/kg. The quality standard was highest in those samples with the lowest Fe and Cu contents. The Cu content was higher in winter than in summer. (*Chem. Abs.* **44**, 4597)

THE CHEMICAL CONSTITUTION OF COPRA MEALS. I. THE CARBOHYDRATES. I. Umeda and M. Hatano (Noda Shoyu Co. Lts.). *J. Agr. Chem. Soc. Japan* **23**, 85-6(1949). Copra meal contained moisture 8.7, crude protein 26.4, pure protein 15.9, crude fat 13.3, ash 3.8, crude fiber 9.5, N-free extract 38.17, galactan 0.46, total soluble carbohydrates 21.08, pentosan 4.97, and reducing sugars 1.35%. (*Chem. Abs.* **44**, 5035)

FACTORS AFFECTING THE OXIDATION OF THE FAT OF DEHYDRATED HERRINGS. A. Banks (Torry Research Sta., Aberdeen, Scot.). *J. Sci. Food Agr.* **1**, 28-34(1950). Changes in the peroxide and iodine values of petroleum ether extracted fat of herring dehydrated by various procedures were followed during storage at 10° in air. Preliminary holding of the fresh fish on ice for several days before cooking and dehydrating led to high peroxide values. The more severe the initial conditions of cooking, the more stable was the dehydrated product. Rapid drying at 80-90° resulted in a more stable product than when drying was carried out at lower temperatures. This was attributed to the increased production of antioxygenic material in the flesh at the higher temperatures. Wood smoke, mixed with air during dehydration, had an excellent antioxygenic effect lasting at least through 280 days' storage at 10°. The heavier the smoking, the greater was the antioxygenic effect. When smoking was combined with low temperature drying (50°), a marked retardation of fat deterioration was achieved. (*Chem. Abs.* **44**, 4599)

PROBLEMS IN FAT ANALYSIS. J. Holmberg (LKB Research Lab., Appelviken, Sweden). *Svensk Kem. Tid.* **62**, 5-35(1950). Review of analytical methods employed in modern fat chemistry. (*Chem. Abs.* **44**, 4695)

RAPID METHOD FOR DETERMINATION OF FAT IN TUNAFISH LIVER. S. Chiavarelli (U. Rome). *Ann. Chim. Appl. (Rome)* **37**, 274-276(1947). Liver (10 g.) is triturated with 36 g. anhydrous Na_2SO_4 and extracted at room temperature with occasional shaking during 2-3 hours with 200 ml. ether. The extract is weighed for total fat and analyzed colorimetrically for vitamin A. (*Biol. Abs.* Sect. G. **24** [3], 4)

A TECHNIQUE TO DETERMINE FATTY ACIDS. P. Dubouloz, Y. Suzanne, and J. Villiers (Fac. Med., Marseille). *Bull. Soc. Chim. Biol.* **30** (9/10), 538-542(1948). After saponification of fatty acids by alcoholic KOH, aqueous $BaCl_2$ is added which precipitates the Ba soaps and $BaCO_3$. The excess base is then titrated with 0.02 *N* HCl. It is maintained that the procedure is simpler and more accurate than other methods, particularly gravimetric methods. (*Biol. Abs.* Sect. G. **24** [3], 4)

UNIFICATION OF THE METHOD OF FAT DETERMINATION IN MILK PRODUCTS. N. Pichugina, Yu. Slavyanov, A. Korsakova, and B. Feigina (1st Leningrad Milk Plant). *Molochnaya Prom.* **11** (2), 31-3(1950). The current Russian methods for fat determination are discussed. (*Chem. Abs.* **44**, 4593)

GOVERNOR AT OPENING OF NEW SOYBEAN SOLVENT EXTRACTION PLANT. Anon. *Am. Miller & Processor* **78** (6), 30(1950). Description of new plant at Bloomington, Ill.

PATENTS

RECOVERY OF THE UNSAPONIFIABLE FRACTIONS OF FATTY MATERIALS. L. O. Buxton (Nopco Chemical Co.). *U. S. 2,508,220.* The unsaponifiable material in a fat is recovered by extracting the saponified fat with a hydrocarbon or chlorinated hydrocarbon solvent at about 40°. The water content of the soap is adjusted so that it is slightly soluble in the warm solvent.

SHORTENING. E. B. Jaeger. *U. S. 2,508,393.* A shortening is claimed which consists of from 12-30% of a monoester of a higher fatty acid and glycerol or propylene glycol, an emulsifying agent other than the monoester, from 27 to 68% water and a fat.

Soybean oil. J. L. Jakobsen (General Mills inc.). *U. S. 2,508,919.* Soybean oil refined by degumming the oil, subjecting the oil to vacuum distillation treatment, and passing a substantially oxygen-free inert gas through the oil, whereby substantially all of the free fatty acids and tocopherols in the degummed oil are volatilized and removed. The residual oil is deodorized at a temperature not in excess of 190°, including treatment of the oil with an oxygen-free inert gas.

Method of producing mono- and diglycerides of fatty acids. G. Barsky (E. F. Drew & Co. inc.). *U. S. 2,509,413.* Mono- and diglycerides of fatty acids are produced by heating triglycerides in the presence of boric acid at a temperature not less than 250° for at least one hour and removing the lower fatty acids by distillation.

Shortening agent. G. Barsky (E. F. Drew & Co. inc.). *U. S. 2,509,414.* A shortening agent is claimed which consists of a glyceride oil and the reaction products of mono- and diglycerides of higher fatty acids with a water soluble hydroxy acid. The hydroxy groups in the glycerine radical are fully esterified.

Method of treating castor oil bean cake. Elaine le Breton and P. Gregory ("Societe Organico," Paris, France). *U. S. 2,509,511.* An edible product is made from this cake by treating it with a 5% HCL solution for about two hours at 110 to 115°.

Method of separating higher fatty acids. N. V. Feldpush (Wilson & Co. inc.). *U. S. 2,510,015.* Prechilled solidified particles of a mixture of normally liquid and normally solid fatty acids of from 10-300 mesh are contacted with a solvent at 0 to —10°. The normally liquid fatty acids are found in the solution.

Preparation of break-free glyceride oils. R. M. Christenson (Pitts. Plate Glass Co.). *U. S. 2,510,379.* To overcome the tendency of oil to produce break, it is treated with alkali, then with a strong acid in amount equivalent to the total alkali and the resultant salt removed.

Apparatus and method for solvent extraction. G. N. Harcourt (Blaw-Knox Co.). *U. S. 2,510,221.* A method for the continuous solvent extraction of oil bearing materials is discussed.

Stabilized oleaginous materials. L. O. Buxton and C. E. Dryden (Nopco Chem. Co.). *U. S. 2,511,427.* A stabilized fatty material is produced by heating the fat with a small quantity of phosphatides in the presence of ammonia. The excess ammonia and water are removed by distillation under reduced pressure and the heating is continued until the ammonium soaps of the fatty acids are decomposed.

Antioxidants. L. O. Buxton and C. E. Dryden (Nopco Chem. Co.). *U. S. 2,511,428.* An improved antioxidant is produced by reacting ammonia with a phosphatide in the presence of a volatile organic solvent. The reaction mixture is heated under vacuum to remove volatile components and to decompose the ammonium soaps.

Synergistic antioxidant. L. A. Hall (Griffith Labs. inc.). *U. S. 2,511,802.* An antioxidant composition is claimed which consists of a mixture of an acid of the class consisting of benzoic, fumaric, tartaric, and citric, and an ester such as the low molecular weight alkyl esters of gallic or ascorbic acid. From 3 to 50% of the total composition consists of the acid.

Antioxidant flakes. L. A. Hall (Griffith Labs. inc.). *U. S. 2,511,803.* A composition of matter is claimed which consists of a flaked hydrogenated fat in which there is dissolved from 0.015 to 0.70% of an acid of the class consisting of benzoic, fumaric, tartaric, phosphoric, ascorbic, and citric acids and from 0.15 to 0.75% of an alkyl gallate.

Separating mixed fatty acids. Emery Industries inc. *British 632,583.* Stearic acid, palmitic acid, and oleic acid are separated from animal fatty acid stocks by fractional precipitation of the two saturated acids from cold 90% aqueous methanol. (*Chem. Abs.* **44**, 4270)

Stabilizing fats, fatty acids, and fatty acid esters. S. T. Zavody and N. Podnik. *British 633,084.* A process for retarding the oxidative deterioration of these substances by addition of less than 1% of sinapic acid methyl ester, ferulic acid methyl ester, hydroferulic acid, o-coumaric acid methyl ester, sinapic acid, and similar compounds is described. (*Chem. Abs.* **44**, 4697)

Separation of sterols. N. V. Veenendaalsche Sajet- en Vijfschachtfabriek voorheen Wed. D. S. van Schuppen en Zoon. *Dutch 65,260.* Sterol-containing material is treated with 2-8 moles $ZnCl_2$ per mole of sterol and the non-sterol compounds extracted with isoöctane. The insoluble addition product is decomposed with water to give sterols in high yield (90%) and of high purity (95%). (*Chem. Abs.* **44**, 4520)

• Biology and Nutrition

R. A. Reiners, Abstractor

The influence of phosphate fertilization on the carotene and riboflavin content of the soybean plant. W. J. Peterson, F. W. Sherwood, and G. Matrone. *Amer. Fertilizer* **109** (3), 24(1948). Although the mean weight of individual plants receiving P was 2.5 times that of plants without P, the proportions of leaves, stems, and pods were not influenced by fertilizers. P fertilizers increased the carotene content of the leaves from 186.4 to 222.6 mg./g. on an air-dry basis, and riboflavin from 22.03 to 25.69 mg./g. (*Biol. Abs.* Sect. G. **24** [3], 36)

Evaluating soybean oil meal protein for chick growth by enzymatic release of amino acids. G. R. Ingram, W. H. Riesen, W. W. Cravens, and C. A. Elvehjem (Univ. Wisconsin). *Poultry Sci.* **28** (6), 898-902(1949). Nine samples of soybean oil meal were subjected to enzymatic hydrolysis and the release of certain amino acids determined microbiologically. These values were correlated with chick growth supported by the same samples. The data presented show that there is a close correlation between the growth of chicks fed the soybean oil meal samples and the liberation of certain amino acids by the *in vitro* technique used. (*Biol. Abs.* Sect. G 24 [4], 34)

The oxidation of fatty acids in the animal organism. F. L. Breusch. (Univ. Istanbul, Turkey). *Angew. Chem.* **62**, 66-72(1950). A comprehensive treatise covering the various possible mechanisms of fatty acid degradation. (*Chem. Abs.* **44**, 4985)

Biochemical and physiological study of palm-oil cake. M. C. Malakar and P. Rombauts (Lab. biochem. Nutrition, C.N.R.S., Bellevue, France). Oleagineux 5 No. 1, Suppl. 12 pp. (1950). Palm-oil cake contains less protein than most oil cakes and more glucosides. The P/Ca ratio is unusually favorable, especially more so than that of peanut-oil cake. The proportions of the amino acids are fairly good; the lysine content is high. The vitamin content and the digestibility of the proteins are little affected by heating. When used as the sole article of diet for white rats, positive balances were obtained for protein, P, Ca, and Mn. It is a good constituent of the ration for dairy cows, especially if some of the fat is left in it. (*Chem Abs.* **44**, 4978)

The acute and chronic toxicity of nordihydroguaiaretic acid. Elizabeth M. Cranston, Mary J. Jensen, Adelaide Moren, Theresa Brey, E. T. Bell, and R. N. Bieter (Univ. of Minnesota). Federation Proc. **6**, 318-19(1947). The acute toxicity of nordihydroguaiaretic acid was less than that of phenol and catechol on oral administration to mice, rats, and guinea pigs, and intraperitoneally in mice. Orally in mice and rats, both NDGA and gum guaiac were relatively nontoxic. Chronic toxicity experiments over a period of two years showed that NDGA had little or no effect on growth or food intake except in the highest concentration (1%) in rats. Histologic study of the liver, spleen, and kidneys showed no significant pathology. (*Chem. Abs.* **44**, 5010)

Changes in world soybean production in 1949. Merna I. Fletcher. *Soybean Digest* **10** (8), 20(1950). World soybean production in 1949 fell 10% below the 1948 figure. Fifty-three % of the world supply was grown in Asia; North America accounted for 44%. The soybean belt is moving both north and south in the western hemisphere.

The action of microorganisms on fats. I. Oxygen uptake by bacteria in the presence of lipid substrates. J. J. Jezeski, H. O. Halvorson, and H. Macy (University of Minnesota) *J. Bact.* **59**, 645(1950). Four bacterial cultures of differing morphological and physiological characteristics were selected for this study from 30 cultures which were shown to oxidize fat. Coconut oil was oxidized by the four cultures at a greater rate than either corn oil or butterfat. Good evidence was obtained that oxygen consumption in the presence of fats may be due to the utilization of glycerol resulting from the action of lipase. Data indicate that at least two enzymes are involved in the oxidation of compounds of the fatty acid series by the individual culture; one is specific for short-chain and one for long-chain fatty acids.

NEW TRENDS IN ANIMAL NUTRITION. H. J. Prebluda (U. S. Industrial Chemicals inc.). *Chemurgic Digest* **9** (6), 19(1950). Vitamin supplementation of animal feeds is discussed.

THE RELATIONSHIPS AMONG CRACKED SOYBEANS FED, BARN TEMPERATURE, AND THE DEGREE OF UNSATURATION OF MILK FAT. J. B. Frye Jr., C. Y. Cannon, and E. W. Bird (Iowa State College) *J. Dairy Sci.* **33**, 257(1950). As the barn temperature increased the iodine value of the milk fat increased. The maximum effect of changing feed on milk fat composition appeared to be reached about 20 days after the first change of feed.

STUDIES ON VITAMIN A IN SOLUTION. I. STABILITY. U. P. Basu and S. Bhattacharya (Bengal Immunity Research Inst., Calcutta). *J. Indian Chem. Soc.* **26**, 419-24(1949). Vitamin A dissolved in vegetable oil can be destroyed when the oil becomes rancid, owing to the formation of peroxides. Unsaturation in the solvent is not the sole cause of Vitamin A deterioration. Propyl gallate and methylhydroquinone decreased the rate of decomposition about 50%. (*Chem. Abs.* **44**, 4098)

SYNTHETIC FATTY ACIDS AS FOODS. H. H. Meyer-Doring (Hyg. Inst. Hansestadt, Hamburg, Ger.). *Klin. Wochschr.* **27**, 113-16(1949). The following considerations argue against the use of synthetic fats for food: a) there is no published procedure for the determination of iso-fatty acids, certain of which are definitely toxic; b) there is no specific method for determining dibasic acids in fats; c) the many animal experiments which have been cited do not prove the harmlessness of the fats since unsuitable experimental animals were used, the experiments were too short, and improper methods were used for studying liver or kidney damage; d) there is an increase in excretion of dibasic acids and the possibility of kidney damage in human subjects; e) in human experiments with synthetic fats their harmlessness was not shown since the experiments were too short; f) the metabolism of the odd-numbered fatty acids is still not clear. (*Chem. Abs.* **44**, 4161)

AN ELECTROPHORETIC ANALYSIS OF SOYBEAN PROTEIN. D. L. Briggs and R. L. Mann (Univ. of Minnesota). *Cereal Chem.* **27**, 243(1950). Electrophoresis patterns for water extracts of defatted (petroleum ether) soybean meal, containing 95% of the total nitrogen, disclosed the presence of at least seven electrophoretically distinct proteins. "Glycinin," the globulin commonly considered to be the principal protein of soybeans, was found to be a mixture of components which constituted about 75% of the total soybean protein.

COMPARATIVE STUDIES ON CALCIUM UTILIZATION AND GROWTH-PROMOTING VALUE WITH BUTTER FAT AND CRUDE AND REFINED COCOANUT OIL. H. N. De and J. N. Karkun (Dacca U., India). *Indian Jour. Dairy Sci.* **2**, (3), 114-121(1949). Balance experiments with human subjects showed that it was not possible to maintain a positive Ca balance when cocoanut oil was added to a diet containing adequate amount of Ca. The effect was further aggravated when refined or deodorized oil was used. Experiments with rats showed that butter fat at 2.8% level in the diet produced better growth than cocoanut oil added at 10% level. Refined cocoanut oil was inferior to original oil in its growth-promoting property. This difference was attributed to the removal of flavoring materials. (*Biol. Abs.* Sect. G. **24** (4), 16)

METABOLIC STUDY OF THE METHYL GROUPS OF BUTTER YELLOW. R. A. Boissonnas, R. A. Turner, and V. du Vigneaud (Cornell U. Med. Coll., N. Y. C.). *J. Biol. Chem.* **180** (3), 1053-1058 (1949). p-N,N-Dimethylaminoazobenzene (butter yellow, DAB) containing C^{14} in the methyl groups was synthesized and fed to a rat on a relatively normal casein diet for 10 days. The expiratory CO_2 contained the major fraction of the ingested radioactivity. (*Biol. Abs.* Sect. G. **24** (3), 5)

THE VITAMIN E CONTENT OF HUMAN AND BOVINE MILK. R. Abderhalden (Martin-Luther-U., Halle Ger.). *Biochem. Zeitschr.* **318** (1), 48-53(1947). A number of samples of human and bovine milk was examined for their vitamin E content by a new method devised by Kofler which is described in detail. The milk of the normal lactating woman during the 4th to the 10th week after parturition contained on the average 0.943 mg. % vitamin E whereas the average vitamin E content of the milk from nine cows in good nutritional status was 0.061 mg. %. It is suggested from this that the human infant and the lactating woman must have a high vitamin E requirement. (*Biol. Abs.* Sect. G. **24** (3), 11)

SENSITIVITY TO EDIBLE VEGETABLE OILS. K. D. Figley. *Jour. Allergy* **20** (3), 198-206(1949). Allergic sensitivity to the water-soluble proteins of a seed does not indicate allergic sensitivity to the refined oils expressed from that seed. (*Biol. Abs.* Sect. C. **24**, 962)

THE ENZYMIC DEHYDROGENATION OF FATTY ACIDS. P. Fantl and G. J. Lincoln (Alfred Hosp., Melbourne). *Australian J. Exptl. Biol. Med. Sci.* **27**, 403-7(1949). Rat-liver dehydrogenase (*in vitro* at a pH of 8.0 with adenylic acid as a co-enzyme) separately converted margaric, palmitic, and myristic acids to 8-heptadecenoic, palmitoleic, and 5-myristoleic acids, respectively, in yields of approximately 10%. A technique is described for separating and identifying fatty acids on a semi-micro scale based on their distribution between immiscible solvents. (*Chem. Abs.* **44**, 4530)

FLAVOR DETERIORATION ASSOCIATED WITH THE LIPID PHASE OF WHOLE MILK POWDER. A. J. Musset, S. Patton, and C. D. Dahle (Pa. Agri. Expt. Station, State College). *J. Dairy Sci.* **33**, 299(1950). Dry butterfat undergoes certain initial changes in flavor prior to the onset of oxidative rancidity. Such changes are accelerated by heat and the presence of oxygen.

DETERMINATION OF BOUND FAT IN FOODS WITH THE AID OF ZEPHIROL. F. Kiermeier and A. Patschky (Inst. Lebensmitteltechnol., Munich, Ger.). *Z Lebensm. Untersuch. u. -Forsch.* **90**, 98-100(1950). The sample is treated for one hour with a 1:5 Zephirol solution (a mixture of homologous alkyldimethylbenzyl ammonium chlorides) then repeatedly extracted with ether. The method is suitable for flours, corn meal, oat flakes, and baked goods. (*Chem. Abs.* **44**, 4160)

DETECTING FOREIGN FATS IN ICE CREAM. W. H. Martin, W. D. Rutz, and C. H. Whitnah (Kansas State Coll., Manhattan). *Ice Cream Trade J.* **45** (11), 48-9, 85-8(1949). The Reichert-Meissl value was found to be satisfactory for determining adulteration of butterfat in ice cream by vegetable oils. (*Chem. Abs.* **44**, 4599)

BUTTER AND CLARIFIED BUTTER FAT FROM NIGERIA. F. Major and G. Smith. *Bull. Imp. Inst. (Gt. Brit.)* **46** (2/4), 209-212 (1948). The results of the examination of the two samples of butter and three samples of clarified butter fat show them to be of normal composition. The flavors were poor. (*Biol. Abs.* Sect. G. **24** (3), 31)

COMPONENT FATTY ACIDS OF BUTTERFAT, HYDROGENATED GROUNDNUT OIL, AND MUSTARD OIL. V. R. Bhalerao, D. Venkatappiah, and C. P. Anantakrishnan (Indian Dairy Res. Inst., Bangalore). *Indian Jour. Vet. Sci. and Animal Husbandry* **17** (3), 177-183(1947). Component fatty acids of composite samples of buffalo, cow, goat, and sheep butter fats and mustard oil were isolated by fractionation. Cow butter fat contained the largest amount of C_4 acid (11.3 molar %). Buffalo butter fat was similar in composition to cow butter fat. Goat and sheep butter fats differed from the others in containing larger amounts of C_8 to C_{10} acids. The presence of C_{10} to C_{16} unsaturated acids was confirmed in all the four butter fats examined. The main components of mustard oil were oleic (29.8 molar %), linoleic (18.2 molar %), and erucic (46.4 molar %) acids. (*Biol. Abs.* Sect. G. **24** (3) 31)

THE HYDROGENATION OF BUTTER. J. Ferrer. *Proc. 12th Intern. Dairy Congr. (Stockholm)* **2**, 139-46(1949). The best results as regards flavor and color were obtained at 174° and 3 atm. with a nickel on kieselguhr catalyst. The hydrogenated fat when reemulsified and churned gave a product similar to butter and strongly resistant to oxidation. (*Chem. Abs.* **44**, 4596)

FISH OILS AND VITAMINS A AND D. W. Roever (Fa. H. Mack Nachf., Illertissen, Ger.). *Pharmazie* **4**, 504-10(1949). This is a review with 22 references. (*Chem. Abs.* **44**, 4204)

VITAMIN A AND D POTENCIES OF THE LIVER OIL OF PACIFIC COD (*Gadus macrocerphalus*). F. B. Sanford and H. W. Nilson, Commercial Fish. Rev. **11** (5), 13-15(1949). As the season advanced from May to August, the oil content of the cod livers increased while the vitamin A potency of the liver oil decreased. During the early part of the season the increase in oil content was faster than the increase in vitamin A content. During July and early August the change in vitamin A potency of the oil was not great. The average for the entire catch was 1.29 million units of vitamin A per pound of liver. The vitamin D potency of the composite liver oil was 200 U.S.P. units per g. of oil. (*Biol. Abs.* Sect. G. **24**, (4), 11)

PATENTS

REFINED PHOSPHATIDES AND PROCESS FOR MAKING SAME. P. A. Singer and H. J. Deobald (Allied Mills inc.). *U. S. 2,508,624.* Refined phosphatides are recovered from oil foots by emulsifying the foots with water, heating the emulsion until a dough-like consistency is reached, cooling the resulting mass whereby the refined phosphatides separate as the lower layer.

CONCENTRATION OF VITAMIN E. A. W. Hixon and R. Miller (The Chemical Foundation inc.). *U. S. 2,508,387.* The extraction of tocopherol-containing oils with a normally gaseous paraffinic hydrocarbon is claimed to give an oil fraction of increased tocopherol content.

• Waxes

E. H. McMullen, Abstractor

THE RELATION OF THE CHARACTERISTICS AND YIELD OF WAX TO PLANT AGE. E. B. Kurtz Jr. (Calif. Inst. of Tech.). *Plant Physiol.* **25**, no. 2, 269-78 (1950). Thirteen species of plants indigenous to southern Arizona and representative of wide ranges of environmental conditions were collected for study as to the relationships of wax to plant age. After extraction with petroleum ether the lipid extract was separated into wax and non-wax fractions. The yields and physical and chemical characteristics were determined. The yields of the wax and non-wax fractions by age varied differently with each species. The wax melting point did not change markedly with age. Any increase in melting point was correlated with a decrease in unsaturation. The amount of wax acids decreases rapidly in young plants and then slowly increases. This is apparently related to wax ester synthesis. The amount of wax esters and acids increased with age. No relationship was found between carbohydrate and lipid content.

SYNTHETIC AND MODIFIED WAXES. G. W. Wood. Mfg. *Chemist* **20**, 424-9 (1949). A review of the following: fatty derivatives (Lanette waxes, solid fatty acids, glycol esters, Pentawaxes); hydrogenated oils (Opal wax, Boco wax 179); N derivatives (Acrawaxes, solid amines and amides); British synthetics (Abril waxes, Estax waxes); mineral derivatives (Chlorax, Cereclors, Halowax, Sekay wax, Nibren, Clophen, Aroclors); polethylene glycols (Carbowax); solid hydrocarbons (Santowaxes); the German synthetic waxes made by the oxidation of montan wax (I.G. waxes); and the microcrystalline waxes derived from petroleum (Cerese waxes). The manufacturing, properties, and uses of I.G. waxes are presented in some detail. (*Chem Abs.* **44**, 5122b)

COMPARISON OF MELTING POINT METHODS FOR WAX. A. W. Marshall (Petrolite Corp., Kilgore, Tex.). *Anal. Chem.* **22**, 842 (1950). Melting points of 11 different waxes, comprised of crystalline paraffin, plastic microcrystalline, oxidized petroleum, and hard, high melting microcrystalline waxes, were determined by each of the nine different methods which are most generally encountered in the trade. Three critical points near the transition point from solid to liquid wax are postulated. Each of these points is evaluated by one of the methods. High melting, hard microcrystalline waxes are subject to viscosity hysteresis at the melting point.

SOLUBILITIES OF WAXES IN ALCOHOLS AND OTHER SOLVENTS. T. T. Collins Jr. *Paper Ind.* **32**, 58-9, 62-3 (1950). Ten commercial waxes were studied and solubility data are given. The lower the melting point of a paraffin wax, the greater the solubility in an alcohol at an given temperature. The greater the chain length of the alcohol, the higher its solvent power for a paraffin wax. In the presence of rosin or rosin derivative the solubility of a paraffin wax in a solvent at elevated temperatures is increased. Paraffin waxes appear to be sufficiently soluble in alcohol to make possible the preparation of moisture-vapor proof lacquers (based on alcohol as the solvent). 10 references. (*Chem. Abs.* **44**, 5122d)

PATENTS

A NEUTRAL DETERGENT. Societe des produits chimiques de l'Ariege a Lavelanet (Francia). *Ital. 439,173.* This new product which is like a soap is neutral, nontoxic, and nonirritant to the skin. It consists of an emulsion (solid at ordinary temperature) of an active detergent derived from petroleum, such as a neutralized cyclic sulfonate product, and a supporting medium composed of two waxy products; one a polymer of ethylene oxide soluble in water and the other insoluble, such as paraffin. An indicative composition of the mixture is 25% by weight of an active petroleum derivative, 55% waxy product soluble in water, and 20% waxy insoluble product. (*Chem. Abs.* **44**, 5125, 5126)

• Drying Oils

Robert E. Beal, Abstractor

FILM FORMATION IN THE LINOLEUM INDUSTRY. F. T. Walker (M. Nairn & Co. Ltd., Kirkcaldy, England). *J. Oil & Colour Chemists' Assoc.* **33**, No. 356, 83-95 (1950). c.f. *J. Am. Oil Chemists' Soc.* **27**, 152. The Scrim process is described and the ideal proportions of linoxyn (45-50%), partially oxidized oil (28-33%), and unoxidized oil (17-22%) in the "skins" for satisfactory fluxing with rosin is given. A higher content of linoxyn is unsuitable. Factors which affect the character of the product and the theories of oxidation are discussed.

STYRENE COPOLYMERS IN ALKYD RESINS. N. R. Bhow and H. F. Payne. (Polytechnic Inst. of Brooklyn, N. Y.). *Ind. Eng. Chem.* **42**, 700-3 (1950). The mass polymerization reaction of styrene with tung, oiticica, and dehydrated castor oils was slowest with tung and fastest with castor. The ketonic group of oiticica is believed to accelerate the reaction and the faster rate with castor is probably due to the disappearance of styrene in forming polystyrene. Alkyd resins from styrenated castor were faster air-drying and baking than medium or short oil alkyds; their films have better chemical resistance.

THE DEHYDRATION OF CASTOR OIL. A. J. van Duuren (Scheikundig Onderzoek, Buitenzorg, Java). *Landbouw* **21**, 115-32 (1949). Natural and activated montmorillonite earths (4%) are catalysts for the dehydration of castor oil at 180-250° under CO_2 or N. Natural earths are not effective when the reaction is carried out under vacuum but give higher I value products that activated earths otherwise. The addition of 1% Ca carbonate after the reaction lowers the acidity of the high acid number (23-30) product. Increasing the catalyst concentration gave no improvement and increasing the reaction time produced an increase in diene and acid values and polymerization. Tests on bodied oils and varnishes from the product are described. (*Chem Abs.* **44**, 3725)

CHEMICAL EXAMINATION OF THE DRYING OIL FROM THE SEEDS OF *Trichosanthes anguina.* P. Sori and J. S. Aggarwal (Council Sci. and Ind. Research, Delhi). *J. Sci. Ind. Research* (India) **8B**, No. 9, 150-3 (1949). The seeds of the snake gourd contain about 32% oil (I value Wijs 146.4, saponification value 186.0, acetyl value nil, thiocyanogen value 62.5) having the fatty acid composition: trichosaric 40.2, linoleic 15.4, oleic 25.9, palmitic 2.8, and stearic 9.5 (balance glycerol and unsaponifiable). The oil polymerized to a plastic mass when heated with diethyl ether without change in saponification value. With Co linoleate it dried to a nontacky film in one hour on glass. (*Chem. Abs.* **44**, 4265)

THE CHEMISTRY OF THE AUTOXIDATION OF DRYING OILS. W. O. Lundberg (Univ. of Minnesota, Austin). *Official Digest Federation Paint & Varnish Production Clubs* No. **302**, 199-211 (1950). This is a review with 43 references.

KUSUM (SAFFLOWER) OIL. Anon. *Soap, India* **2**, 8-10 (1949). The cold-pressed oil (yield = 20%) from the seeds of *Carthamus tinctorius* and *Carthamus oxycantha* has acid value 1.4, sap. value 190.7, I value (Wijs) 139.5, Acetyl value 15.67, and unsap. matter 0.02%. It can be substituted for linseed oil in the manufacture of boiled oil, paints, varnishes, and linoleum.

STYRENATION OF ALLYLSUCROSE IMPROVES ITS PROPERTIES AS A COATING MATERIAL. A. N. Wrigley and M. Zief (Eastern Regional Research Lab., Philadelphia, Pa.). *Official Digest Federation Paint & Varnish Production Clubs* **303**, 302-8 (1950). Allylsucrose blown to a peroxide value of 50-60 may be mass polymerized with 50% of a mixture of styrene and α-methyl styrene, and 0.5-0.65% tertiary butyl or cumene hydroperoxides at 125°. At higher or lower peroxide values gelation occurred with even lower amounts of styrene. Films of styrenated allylsucrose air-dried or baked at 150°C. have excellent resistance to boiling water but are less resistant than films baked at 100° to certain other test solutions (4% acetic acid, etc.).

INFLUENCE OF DIFFERENT COLORED LIGHT ON THE RATE OF DRYING OF LINSEED OIL. E. Stock. *Seifensieder-Ztg.* **73**, 233-8 (1947). The change in weight at ordinary temperatures of linseed oil films containing various combinations of Pb, Mn, and Co driers when exposed to light filtered through colored glasses is given. The short wave lengths markedly promote drying when Pb, Mn, Co, Pb-Mn, or Co-Mn driers are used. The effect decreases as the wave length increases in going from violet to brown and red decelerates drying. The effect of wave length was less if sunlight was substituted for diffuse light as the light source. With Pb-Mn-Co drier the wave length of the incident light had no effect. (*Chem. Abs.* **44**, 4692)

REACTIONS OF RESINS WITH DRYING OILS. P. O. Powers (Battelle Memorial Institute, Columbus, O.). *Ind. Eng. Chem.* **42**, 146-50 (1950). During the cooking of varnishes, acid, alcohol, or ester interchange or double bond reactions may occur. When rosin and linseed oil were heated at 275° nearly half of the rosin acids replaced fatty acids in the glyceride after two hours. Cloud print determinations of mixtures of mineral oil with the reaction product of linseed oil with a rosin phenolic condensate indicate that equilibrium of acid interchange is also reached in about two hours. When five parts linseed oil to one part resin were used only about 16% of resin remained uncombined at equilibrium. Alcohol interchange is familiar in the preparation of alkyd resins. Ester interchange reactions occur when an ester resin is heated with a drying oil, but no method of measuring the extent of reaction is available. Double bond polymerization occurs to some extent between non-conjugated fatty acids and phenolic resins and to an appreciable extent when conjugated acids are used.

PATENTS

Certain oxyalkylated blown oils and method of making same. M. DeGroote and B. Keiser (Petrolite Corp. Ltd.). *U. S. 2,510,335.* A condensate with distinctly hydrophilic properties is obtained by simultaneously oxidizing with an O-containing gas, oxyalkylating with ethylene oxide, propylene oxide, butylene oxide, glycide or methyl glycide, and condensing a mixture of oiticica and castor oils at 250-280° in the presence of an acid sulfate activating agent. The proportions of the two oils is between one and five parts castor oil to two parts oiticica oil.

• Detergents

Lenore Petchaft, Abstractor

Pressure saponification. R. Fiala. *Seifen-Ole-Fette-Wachse.* **74**, 78-9(1948). A short account is given of a German process for saponifying fats under pressure with Na_2CO_3. The saponification is complete in approximately 90 minutes and gives good quality soap. The aqueous layer contains 10-12% of glycerol. (*Chem. Abs.* **44**, 5619)

Utilization of soap scrap. Lester Farrelly. *Soap, Perfumery & Cosmetics* **23**, 597-9, 616(1950). Soap scrap should be reduced to a minimum, the scrap that is produced should be kept as clean as possible and utilized promptly. Methods of reworking include remelting and framing, remelting and incorporating with freshly crutched soap, reboiling, returning to the amalgamator or mill, or reusing in miscellaneous soap specialty products.

The sorption of soap by textile fibers. A. S. Weatherburn, G. R. F. Rose, and C. H. Bayley (National Research Laboratories, Ottawa, Canada). *Can. J. Research* **28**, 51-61 (1950). The sorption of the sodium soaps of lauric, myristic, palmitic, stearic, and oleic acids from aqueous solutions by various textile fibers has been measured. The sorption of both the fatty acid and alkali components of the soaps by dull acetate rayon and dull nylon fibers was essentially the same as that shown by the corresponding bright (undelustered) fibers while dull viscose rayon sorbed considerably more fatty acid than the bright fiber. In general, the order of increasing sorption was: cotton, nylon, acetate, bright viscose, dull viscose, and wool. Of the saturated soaps, the maximum sorption of fatty acid by all fibers was obtained with sodium myristate while the alkali sorptions were approximately the same for myristate, palmitate, and stearate, all of which were higher than for laurate. The sorption from sodium oleate solutions corresponded approximately to that from the C_{14}-C_{16} saturated soaps. Preferential sorption of alkali by cotton and viscose rayon was observed for all soaps while acetate rayon, nylon, and wool showed preferential sorption of fatty acid with the lower molecular weight soaps and preferential sorption of alkali with the higher soaps. Suppression of hydrolysis by the addition of excess free alkali resulted in a reduction in fatty acid sorption in every case and shifted the maximum from the C_{14} to the C_{16} soap. It is concluded that the sorption of soap by textile fibers is a complex process involving the more or less independent sorption of neutral soap, hydrolytic fatty acid (or acid soap), and hydrolytic alkali.

Some physical-chemical aspects of cotton detergency—limitations of present laboratory testing methods. Joseph M. Lambert and Herbert L. Sanders (General Aniline & Film Corp., Easton, Pa.). *Ind. Eng. Chem.* **42**, 1388-94(1950). A review of the conventional testing methods has been made which showed that the present tests fail in many respects to simulate actual use conditions. It is pointed out that in practice cotton is soiled by complex mixtures rather than by large amounts of finely divided carbon black. Moreover the nonlinear relationship between the reflectance and the amount of soil on the fabric indicates that even trace quantities of ingrained soil can reduce the whiteness of textiles. Also cotton goods are normally soiled and laundered repeatedly throughout their lifetime in contrast to conventional laboratory wash tests which employ only a single cycle with unused cotton. Preliminary results are described which were obtained with several cotton detergents in multicycle wash tests in which roll towels were soiled in actual use, then washed in a home washing machine, and measured in the laboratory. Available field tests made with these detergents substantiated the results of this practical series of tests. Conventional carbon black-type swatches were included in the above washes, but in this case the results failed to correlate with the actual performance data.

Trend to bactericidal soaps. W. Schweisheimer. *Am. Perfumer Essent. Oil Rev.* **55**, 491, 493(1950). This is a review of types and growth of germicidal and medicated soaps. Medicated soaps contained such compounds as tar, mercury bichloride, sulfur, etc., and many were irritating to the skin. Newer products are based on use of hexachlorophene as the germicidal agent. Hexachlorophene does not lose its activity when incorporated in soap, is non-irritating to the skin, is effective in reducing bacterial flora of the skin, and has a cumulative action on the skin.

Bentonite, its properties and uses in soaps. S. N. Sethu Madhava Rao. *Soap* (Offic. Organ S. India Soap Makers' Asso.) **3**, No. 3, 3-13(1950). The chief characteristics of bentonite which are responsible for its extensive use in soaps are its absorption, adsorption, emulsifying capacities, and its colloidal nature. It also has detergent properties which makes it an excellent soap builder. A comparison of the properties of alkalies and bentonite as regards lathering, water-softening, and effect on fabrics show bentonite to be generally superior. Details are given for preparation of bentonite suspensions, their incorporation into soaps, and formulations of various soap products.

Hard water bar soaps. Milton A. Lesser. *Soap Sanit. Chemicals* **26**, No. 6, 42-5, 153, 155(1950). The various types of bar soaps which will work in hard or salt water are reviewed. These are soaps made entirely or chiefly from coconut or palm kernel oils with possibly some superfatting, bars made from combinations of soap and various alkaline builders or sequestering agents, and lastly the newer developments of mixtures of soap and synthetic detergents. Methods of manufacture, formulations and specifications of the above types are included. (43 references)

Comparative detergency of surface-active agents on woolen cloth. Kermit S. LaFleur (Farnsworth Mills, Lisbon, Maine). *Am. Dyestuff Reptr.* **39**, 385-8(1950). The comparative detergency of most of the distinct chemical types of surface-active products was determined for woolen cloth soiled with the oil used in its manufacture (a typical, economical, self-emulsifying mineral oil), using a Launder-Ometer. The comparisons were made on the basis of concentration and money-value, and include trials without a builder, with an alkaline builder (sodium carbonate), or with a neutral builder (NaCl). Neutral scouring with a polyoxyethylene thioether using sodium chloride as a builder was found to be very effective for removing the specific soil; the combination was superior to all others examined. Since the solubility of the polyoxyethylene thioether was considered inadequate for a standing solution, particularly one containing NaCl, a combination of this product with another efficient nonionic material of good solubility (an alkyl aryl polyoxyethylene condensate) was selected as optimum for effectiveness and stability. The optimum concentration of detergent and builder for the specific soil at the specific level (approximately 6%) was found to be 0.5% and 4% respectively on the cloth weight; the optimum pH for the system appears to be about 7.

Titanium dioxide in soaps. Anon. *Soap, Perfumery & Cosmetics* **23**, 589-90, 604(1950). It is used in soaps as a whitening agent and to improve the opacity of toilet soaps.

PATENTS

Combined soap and synthetic detergent bar. Donald E. Marshall (Colgate-Palmolive-Peet Co.). *U. S. 2,508,578.* A composite soap and detergent bar consisting of an exposed surface of a fatty acid soap for producing a cleansing lather in combination with an exposed layer of a synthetic detergent to lessen the soap irritation and promote rinsing of the insoluble soaps.

Caustic alkali detergent composition. Lawrence L. Little (E. F. Drew & Co. inc.). *U. S. 2,509,440.* Preparation of an alkali detergent composition consisting of an alkali metal hydroxide, a small amount of a polyphosphate to improve rinsing, and a water dispersible amine such as triethanolamine to improve adherence between hydroxide and polyphosphate and increase wetting properties of the mixture.

Germicidal detergent composition. Elwyn E. Mendenhall (Economics Laboratory inc.). *U. S. 2,510,510.* Combination of a water-soluble detergent (soap or synthetic) and a glassy phosphate having sufficient silver content to impart germicidal properties to the mixture.

Scouring agent and household soap. H. L. E. Lietar. *Belg. 482,363.* Urea is incorporated in soap pastes and scouring powders. (*Chem. Abs.* **44**, 5622)