diffraction pattern offers a simple explanation for this. Mixtures of even-even or odd-odd acids form a one-phase system; mixtures of odd-even form a two-phase system and give diffraction patterns in which those of the pure components are superimposed.

Similar results are obtained in the melting points of the dihydroxystearic acids. Binary mixtures (50:50) of the dihydroxystearic acids from odd-odd or even-even octadecenoic acids have melting ranges from 2-5° whereas those from odd-even acids have melting ranges from 6-18°.

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

• Oils and Fats

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Component Fatty Acids of Indian Snake Oils. Y. D. Karkhanis and N. G. Magar (Dept. Biochemistry, Institute of Science, Bombay 1, India). *Biochem. J.* **60**, 565–8 (1955). The component fatty acids of the oils of two Indian snakes, *Python molurus* and *P. stinotis*, were studied. The following fatty acid percentages were found, with the first value that of *Python molurus* and the second value that of *P. stinotis*: myristic, ..., 1.6; palmitic, 16.1, 15.7; stearic, 10.1, 13.3; arachidic, 2.3, 1.0; tetradecenoic, ..., 0.2; hexadecenoic, 4.8, 5.2; octadecenoic, 41.3, 36.8; octadecadienoic, 7.6, 9.4; octadecatrienoic, 3.0, 3.2; eicosenoic, 11.9, 12.8; eicosatetraenoic, ..., 0.8; and docosenoic, 3.0, ...

Extraction technique in cottonseed oil processing. M. Pilette. *Oleagineux* **10**, 303–308, 399–407, 495–500 (1955). Commercial methods and equipment for preparing the seeds, recovering the oil by pressing and purifying the crude cottonseed are reviewed. The nutritive value of the press cakes and the influence of the various extraction processes on the quality of the products also are considered.

Viscosimetry of vegetable oils. II. Kinematic viscosity of mixtures of olive oil with n-butanol, isoamyl alcohol, and cyclohexanol at different concentrations and temperatauures. P. Klantachnigg *Olearia* **9**, 105–113 (1955). Kinematic viscosity studies were made on mixtures of olive oil in *n*-butanol, isoamyl alcohol and cyclohexanol at temperatures of 10–80°. The mixing of olive oil with *n*-butanol or isoamyl alcohol gave no appreciable variation in volume over that of the added oil. With cyclohexanol there was a volume increase greater than that of the added oil. The addition of small quantities of oil to *n*-butanol and isoamyl alcohol gave much smaller changes in viscosity than the addition of small quantities of the alcohols to the oil. Such variations in viscosity diminished noticeably as the temperature was increased. Mixtures of oil with cyclohexanol showed the phenomenon of negative viscosity which decreases as the temperature is raised until it disappears above 60°. The Walther equation for viscosity-temperature relationships was found to be applicable to mixtures of the oil with the three solvents when a constant, calculated additively from that of the oil and that of solvent, was introduced.

The oil from the seeds of Hippophae Rhamnoides L. I. Study of the fatty acids. H. P. Kaufmann and A. Vazquez Roncero. *Grasas y Aceites* **6**, 81–87 (1955). Finely pulverized seeds of *Hippophae Rhamnoides L.* were Soxhlet extracted with hexane to give 6.4% of an intensely red oil. The oil contained 2.1% of unsaponifiables (petroleum ether method) and had an acid number of 5.97, a saponification number of 186.8, an iodine value of 152.3, a thiocyanogen value of 100.2, a hydroxyl value of 11.9, and contained 93.8% of total fatty acids. Chemical constants also were determined for the total acids recovered from the saponification of the oil. From these values it was calculated that the total fatty acids contained 11.6% of saturated acids, 26.6% oleic acid, 34.7% linoleic acid, 27.0% linolenic acid and no tetra-unsatruated acids. Spectrophotometric studies gave results of about the same order except that 1.74% of a tetra-unsaturated acid was detected. Qualitative paper chromatography studies indicated that the saturated acids consisted of palmitic and stearic acids only.

II. Study of the unsaponifiables. *Ibid.*, 129–134 (1955). The unsaponifiables were recovered in the usual way from the oil by saponification and ether extraction with all operations being carried out under an inert atmosphere. The carotinoids were separated by chromatography on alumina and the various fractions were studied by absortion spectra. Zeaxanthin, cryptoxanthin, β-carotene, γ-carotene and probably lycopene were detected. Quantitative studies showed the presence of 58.1 mg. of zeaxanthin, 64.8 mg. of cryptoxanthin, and 8.7–9.8 mg. of β-carotene per 1,000 grams of oil. The sterols were isolated from the unsaponifiables as the digitonides and by 0° crystallization of a methanolic solution of the unsaponifiables. The sterols were characterized as sitosterols by formation of the bromides and acetates.

Study on the oils from the hulls of Tunisian olives. M. R. Fuhrmann. *Revue Francaise des Corpus Gras* **2**, 237–256 (1955). Samples of the oil from the hulls of Tunisian olives were saponified, the unsaponifiables extracted with ethyl ether and the fatty acids recovered from the soap solution in the usual manner with all operations being conducted under an atmosphere of nitrogen. The total fatty acids made up 94% of the oil, while the unsaponifiables amounted 2.0–2.5%. The acids were separated into two fractions by crystallization from acetone at −28° with the precipitated fraction being recrystallized twice from the same solvent. Each of the acid fractions was converted separately into the methyl esters which were distilled under vacuum. The unsaponifiables were separated into a number of fractions by chromatography on alumina and crystallization. Characterization studies were conducted on all fractions. The fatty acid fractions were made up of the following acids: myristic (0.7%), palmitic (13.9%), stearic (1.9%), saturated acids containing more than 20 carbon atoms (0.9%), palmitoleic (1.6%), oleic (64.0%), linoleic (15.1%) and unsaturated acids containing more than 20 carbon atoms (2.1%). Chlorophyll decomposition products amounting to 0.03–0.04% of the whole oil also were recovered from the saponifiable fraction. Hydrocarbons isolated from the unsaponifiables made up 0.50 to 0.66% of the whole oil and contained straight chain paraffins of an average molecular weight of C_{29}–C_{31}, squalene (0.17–0.22% of the oil) and a mixture of at least 4 hydrocarbons, one of which showed an intense blue fluorescence. Sterols also were present in the unsaponifiables and made up 0.48–0.54% of the oil. These consisted of β-sitosterol, provitamin D and an uncharacterized dextrorotary sterolic fraction with a melting range of 164–167°. A mixture of at least three straight chain fatty alcohols (0.20–0.30% of the oil) in the range C_{24}–C_{28} was present in the unsaponifiables as well as an amorphous transparent dextroratory resinous fraction which amounted to 1% of the oil and contained hydroxyl groups which could be acetylated. The remainder of the unsaponifiables consisted of carotenoid pigments.

Tall oil comes of age. Anon. *Paint Oil Chem. Review* **118** (15). 10 (1955). Tall oil is defined, and the production and economics are discussed.

Preparation and evaluation of two new fat-soluble metal inactivators. A. Schwab and C. Evans (Northern Utilization Research Branch, Agr. Research Service, U. S. Dept. of Agriculture, Peoria, Ill.). *J. Agr. and Food Chem.* 3, 518–521 (1955). Two new fat-soluble metal inactivators have been prepared and evaluated for stabilization of vegetable oils. One of the compounds, a mono-octadecyl ester of (carboxymethylmercapto)-succinic acid, is of the tridentate type, having two carboxy groups in either α or β positions to the coordinating sulfur atom. The other, a mono-octadecyl ester of thiodisuccinic acid, belongs to the tetradentate class. Both compounds have the essential structure for effective chelation of metals. The tetradentate compound was not superior to the tridentate compound in stabilizing soybean oil against oxidative deterioration. The mono-octadecyl ester of (carboxymethylmercapto)-succinic acid represents a new type of ester of this acid. It did not impart an objectionable flavor to soybean oil and good solubility in oil was attained. The heat instability of the ester will limit its addition to the cooling phase of the deodorization. Good oxidative stabilities were also obtained for the mono-octadecyl ester of thiodisuccinic acid in the usual concentration range employed for inhibitors. A significant improvement in the organoleptic flavor scores of the treated samples over that of the control was noted in both initial and aged samples. Again the disadvantage of heat instability limited the addition of the ester to the cooling phase of the deodorization.

Processing cottonseed with screw presses. A. C. Wamble (Texas Eng. Exp. Station, College Station). *Oil Mill Gaz.* **60** (20), 16–17 (1955). A review.

Increased profits with direct solvent extraction. A. V. Graci and G. E. Bailie (Wuster & Sanger, Inc.). *Oil Mill Gaz.* **60** (1), 9–18 (1955). The filtration-extraction process for the direct extraction of oil-bearing materials is described. Economic balances show that the solvent extractor is more profitable than hydraulic or screw press operations.

Extraction of cottonseed by pre-pressing and extracting prepressed cake. R. P. Hutchins (French Oil Mill Machinery Co., Piqua, Ohio). *Oil Mill Gaz.* **60** (20), 28–29 (1955). A review.

Direct extraction of cottonseed—the recovery of phosphatides and the reincorporating back into the meal. W. C. Whittecar (Plains Cooperative Oil Mill, Lubbock, Texas). *Oil Mill Gaz.* **60** (20), 22–25 (1955). Gums are precipitated from crude cottonseed oil and added to the meal in the desolventizer. The meal sells at a premium.

Low angle X-ray diffraction study of the polymorphic forms of synthetic α:β and α:α′-kephalins and α:β-lecithins. J. B. Finean and P. F. Millington (Dept. Pharmacology, Univ. Birmingham). *Trans. Faraday Soc.* **51**, 1008–15 (1955). Low angle X-ray diffraction properties are reported for polymorphic forms of α:α′- and α:β-diacyl phosphatidyl ethanolamines (dilauryl, dimyristyl, dipalmityl and distearyl cephalins) and a corresponding series of α:β-diacyl phosphatidyl cholines (lecithins). The layer spacings of these compounds decreased, usually in well defined steps, with rise in temperature and thus showed polymorphic transitions. Difficulties were experienced in obtaining consistent results with the lecithin samples at room temperature. Results are discussed in terms of a tilting of the long chain molecules within the layers as a result of modifications of the balances between intermolecular van der Waals' and ionic forces.

Kamala seed oil. J. S. Aggarwal (Natl. Chem. Lab. of India, Poona, India). *J. Sci. Food Agr.* 6, 364–8 (1955). The composition and properties of kamala oil, the characteristics and probable structure of α- and β-kamlolenic acids, and the potential industrial uses for the oil are reviewed.

Report on fats, oils, and waxes. G. Kirsten (Food & Drug Admin., Dept. Health, Educ. and Welfare, New York 14, N. Y.). *J. Assoc. Off. Agr. Chemists* 38, 656–7 (1955). Progress in the following studies is reviewed briefly: spectrophotometric methods for fats and oils, color in oleomargarine, antioxidants, coal tar colors, and foreign fats in dairy products.

Report on spectrophotometric methods for fats and oils. D. Firestone (Food & Drug Admin., Dept. Health, Educ. and Welfare, New York 14, N. Y.). *J. Assoc. Off. Agr. Chemists* 38, 657–63 (1955). Ten commercial refined corn oil samples and 11 commercial refined soybean oil samples were analyzed by the A.O.C.S. Tentative Method Cd 7-48 (revised May, 1951) with 6.6% potassium hydroxide-glycol reagent. The average linolenic acid content of the corn oils was 0.64% and of soybean oils 7.06%. Soybean oil can be determined in admixture with corn oil by estimation of the linolenic acid content of the mixture. Two horsefat samples were analyzed by isomerization with 21% potassium hydroxide-glycol reagent and 11% potassium hydroxide glycerol reagent. The glycol reagent gave lower and, probably, more accurate values for pentaenoic acids. Arachidonic and pentaenoic acid contents of 11 butter and 8 margarine samples were determined by means of the 21% potassium hydroxide-glycol reagent. Neither of these acids was found in margarine. The butterfats contained an average of 0.19% arachidonic and 0.11% pentaenoic acids. Comparisons were made of blanks obtained with 6.6% and 21% potassium hydroxide-glycol reagents under different blanketing atmospheres during the isomerization. Essentially the same blanks were obtained when either prepurified nitrogen (less than 0.01% oxygen) and water-pumped nitrogen (0.3% oxygen, maximum) was used but air blanketing gave blanks having higher light absorption. Similar effects of the blanketing gases were observed with two oil samples isomerized by 6.6% potassium hydroxide-glycol reagent.

Rapid determination of fat in meat products. H. Salwin, I. K. Bloch, and J. H. Mitchell, Jr. (Quartermaster Food and Container Inst. for the Armed Forces, Chicago, Ill.). *J. Agr. and Food Chem.* 3, 588–593 (1955). Determinations of fat in meat products require approximately 30 min. with a modified Babcock procedure. Clear fat columns are separated with a perchloric acid-acetic acid mixture which completely digests proteins, cereals, and spices. Results agree closely with those obtained by the dry solvent extraction technique of the Association of Official Agricultural Chemists.

Determination of parathion in olive oil. V. P. Ramos, Ida de Carvalho, M. L. Neto and Ema Cabaco. *Oleagineux* **10**, 509–511 (1955). Samples of olives obtained from orchards that had been sprayed with the commercial insecticide were benzene washed to remove parathion adhering to the epidermis before extracting the oil with solvent. Parathion contents of 2.1 to 10.5 parts per million were determined in 12 samples of oil by a slightly modified Averill-Norris procedure. It would be expected that pressed oils would contain smaller quantities of the insecticide than those obtained by solvent extraction.

Identification of traces of isovaleric acid in butter adulterated with hydrogenated dolphin oil. G. D. Arrigo. *Olii-Minerali-Grassie Saponi-Colori e Vernici* 32, 2–7 (1955). The volatile acids are separated from the butter by the same technique used to determine the Reichert-Meissel value, the acidic liquid is allowed to cool at 15° for about 30 minutes, then is filtered and the filtrate is neutralized with 0.1 *N* potassium hydroxide. The resulting solution is concentrated on a water bath and a portion of the concentrate is applied by means of micropipette at a point about 3 cm. from the bottom of the sheet of paper to be used so that a spot not greater than 7–8 mm. in diameter is obtained. The paper is allowed to stand for several hours in a closed vessel in contact with the vapor of the stationary aqueous phase. The chromatogram is developed over a 10-hour period with a solution of butanol-1 saturated with an equal volume of 3 *N* ammonia. A solution of 50 mg. of bromophenol blue dissolved in 100 cc. of water to which 200 mg. of citric acid is added serves as an indicator for the various zones as in the chromatogram by forming intense blue spots. Isovaleric acid may be detected in butter adulterated with as little as 1.5% of hydrogenated dolphin oil.

Limitations of the application of the periodic acid method to the determination of monoglycerides in oils. C. S. Martin Parez and M. T. Santos Molero. *Grasos y Aceites* 6, 135–140 (1955). Abnormally high values for the monoglyceride contents of various fish liver oils are obtained when the periodic acid method is used. Hydroxyl values are cited to show that the periodic acid reducing capacity of the oil cannot be due solely to the presence of monoglycerides. Although certain of the unsaponifiables, particularly vitamins A and E, do reduce periodic acid they are not present in a sufficient quantity to account for the observed difference. Since the acetylated oils reduce periodic acid, the phenomenon is not due to the presence of dihydroxy- or ketohydroxy-acids having the substituents on adjacent carbon atoms. It is suggested that products resulting from the combination of the double bonds in the oil with oxygen are responsible.

Separation of small quantities of saturated higher fatty acids by reversed-phase paper chromatography. B. D. Ashley and U. Westphal (Biochem. Dept., Army Medical Research Lab., Fort Knox, Kentucky). *Arch. Biochem. Biophys.* **56**, 1–10 (1955). Methods were developed for the separation of small quantities (order of 10–50 micrograms) of saturated higher fatty acids (C_{12}–C_{24}). Filter paper coated with paraffin oil or latex served as a supporting medium in reversed-phase chromatography. Procedures were worked out for the demonstration of the fatty acid spots as lead sulfide or lead rhodizonate. Recognition of the fatty acids by bromothymol blue was found to be somewhat less sensitive.

Apparatus for solvent extraction of vegetable oils. M. W. Pascal (Sherwin-Williams Co.). *U. S. 2,714,551.* Apparatus for solvent extraction of oil-bearing seeds is described and includes mixers, centrifuges and pumps.

Processing alkyl esters of fatty acids. C. G. Goebel(Emery Indus., Inc.). *U. S. 2,714,603.* Esters of volatile monohydric alcohol and C_{12-22} fatty acids are hydrolyzed by boiling with water containing Twitchell reagent and acid. As water and alcohol boil off during the hydrolysis, volume of reaction mixture is maintained by the addition of water.

Production of sterols from tall oil pitch. H. Albrecht and R. Herrlinger(American Cyanamid Co.). *U. S. 2,715,638.* Tall oil pitch is mixed with sufficient aqueous hydroxide or carbonate of sodium, ammonium or lithium to neutralize the fatty acids but not saponify the sterol esters. After removal of the soaps, the sterol esters are saponified with alcoholic potassium hydroxide. The hydrolyzate is diluted with 2 to 5 volumes of water at temperatures between 40° and the boiling point of the solution. Sterols separate as the mixture is gradually cooled.

Production of sterols from tall oil pitch. H. Albrecht and R. Herrlinger(American Cyanamid Co.). *U. S. 2,715,639.* Tall oil pitch is saponified with at least 20% excess of alcoholic potassium hydroxide. The hydrolyzate is diluted with 2 to 5 volumes of water at temperatures between 40° and the boiling point of the solution. Sterols precipitate as the solution is gradually cooled.

Production of saturated fatty acids. J. W. Opie(General Mills, Inc.). *U. S. 2,715,641.* Unsaturated fatty acids are hydrogenated in the presence of a nickel catalyst and bleaching earth until the iodine value is below 5. Distillation of the product yields saturated higher fatty acids of good color.

Method of removing ketones from fatty acids. G. Barsky(E. F. Drew and Co., Inc.). *U. S. 2,715,642.* An alkylolamine is added to the mixture of fatty acids and ketones. After heating and thorough mixing, sufficient water is added to form a 20 to 30% soap solution. Two layers form and are separated.

Fatty acids and their derivatives in the flotation of minerals. P. Blaizot. *Oleagineux* 10, 473–478(1955). The use of fatty acids and fatty amines in mineral flotation are reviewed.

Synthetic α-amino-β-hydroxycaproic acids. H. Buston and J. Bishop(Biochemical Labs., Dept. of Botany, Imperial College of Science, London, Eng.). *J. Biol. Chem.* 215, 217–220(1955). Two stereoisomeric forms of DL-α-amino-β-hydroxy-*n*-caproic acid and two of DL-α-amino-β-hydroxyisocaproic acid have been prepared, and some of their chemical and biological properties are recorded.

The dielectric properties of urea occlusion compounds. R. J. Meakins(Commonwealth Sci. & Indus. Res. Organ., Div. Electrotechnology, Sydney, Australia). *Trans. Faraday Soc.* 51, 953–61(1955). Dielectric properties of urea adducts of the following compounds were determined and are discussed in terms of the structures of the adducts: *n*-docosane, pelargonone, palmitone, stearone, methyl palmitate, cetyl acetate, didodecyl ether, 12-bromotricosane, 16-bromohentriacontane, *n*-octadecyl bromide, and 1:10-dibromodecane.

Unsaturated fatty acid esters of alloxy hydroxybutenes. D. Swern(Sec'y Agr., U.S.A.). *U. S. 2,715,132.*

• Biology and Nutrition

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

Polyethenoid fatty acid metabolism. VIII. Nonpotency of cis-9,trans-12-linoleate as essential fatty acid. O. S. Privett, F. J. Pusch, and R. T. Holman(Hormel Institute, Univ. of Minn., Austin, Minn.). *Arch. Bichem. Biophys.* 57, 156–162(1955). Ethyl *cis*-9,*trans*-12-linoleate does not exhibit essential fatty acid activity as judged by effects upon dermal symptoms, water consumption, or growth. Both double bonds in the linoleate molecule must be *cis* if it is to possess essential fatty acid potency. However, the *cis,trans* isomer of linoleate plus linolenate gave greater growth than either supplement alone. All groups receiving linolenate showed high pentaenoic acid and hexaenoic acid contents, and diminished tetraenoic acid contents. The data suggest that in the group receiving linoleate plus linolenate, hexaenoic acid contents are less and pentaenoic acid contents are higher than in the group receiving linolenate alone. *Trans* double bonds derived from *cis*-9,*trans*-12-linoleate are retained and deposited in the tissue lipides of the animal.

The inhibition of certain mitochondrial enzymes by fatty acids oxidized by ultraviolet light or ascorbic acid. A. Ottolengi, F. Bernheim and K. M. Wilbur(Dept. Physiology and Pharmacology, Duke Univ., Durham, North Carolina). *Arch. Biochem. Biophys.* 56, 157–164(1955). The relation between lipide oxidation and the activity of succinoxidase, choline oxidase, and aminoxidase of rat liver mitochondria has been examined following ultraviolet irradiation, incubation of mitochondria with ultraviolet-irradiated methyl linolenate and methyl linoleate, and incubation with ascorbic acid. Ultraviolet irradiation of mitochondria produced an oxidation of lipide which was directly proportional to the period of irradiation. Succinoxidase and choline oxidase were inhibited in direct proportion to the extent of lipide oxidation. Succinoxidase was inhibited by ultraviolet-irradiated methyl linolenate and its water-soluble oxidation products. The unoxidized ester had little or no effect. Methyl linolenate and methyl linoleate oxidized to the same degree by ultraviolet irradiation had equal inhibitory action on succinoxidase.

Carbohydrate sparing of fatty acid oxidation. I. The relation of fatty acid chain length to the degree of sparing. II. The mechanisms by which carbohydrate spares the oxidation of palmitic acid. W. J. Lossow and I. L. Chaikoff(Dept. Physiology, Univ. of Calif. School of Medicine, Berkeley, Calif.). *Arch. Biochem. Biophys.* 57, 23–40(1955). Carboxyl-labelled fatty acids of the even series (C_8–C_{16}) and the triglycerides of carboxyl-labelled palmitic and capric acids were injected into fasted and carbohydrate-fed rats. The expired CO_2 was collected at various intervals for 24 hr.; and cumulative $C^{14}O_2$ and the specific activity-time curves were derived for each rat. The conversion of the C^{14} of the injected fatty acids to CO_2 was lower in the fed than in the fasted rat. This sparing action of carbohydrate was more pronounced in the case of the longer-chain fatty acids. The conclusion was drawn that the principal action of carbohydrate in sparing the oxidation of palmitic acid is in restricting its breakdown.

Phospholipide metabolism during hypertrophy and hyperplasia in rat prostates and seminal vesicles. E. Levin, S. Albert and R. M. Johnson(Richard Cohn Radiobiology Lab., Detroit Inst. of Cancer Res., Detroit, Mich.). *Arch. Biochem. Biophys.* 56, 59–65(1955). Control, castrated, and testosterone-treated rats were given subcutaneous injections of 0.45 μc. of radioactive phosphorus, as $NaH_2P^{32}O_4$, and were sacrificed 2 hr. later. The radioactivity and total P contents of the acid-soluble phospholipide, cephalin, lecithin, sphingomyelin, and DNA fractions of prostates and seminal vesicles, and the mitotic incidence in these tissues, were determined.

Studies in carotenogenesis. 15. The role of carboxylic acids in the biosynthesis of β-carotene by Phycomyces blakesleeanus. J. Friend, T. W. Goodwin and L. A. Griffiths(Dept. Biochemistry, University, Liverpool). *Biochem. J.* 60, 649–655(1955). *P. blakesleeanus* cultured on a medium containing acetate as the sole carbon source grows better and produces more β-carotene than on media containing lactate or pyruvate as the sole carbon source. Addition of either acetate or any member of the tricarboxylic acid cycle (0.02*M*) to a medium containing glucose and ammonium nitrate stimulates growth equally in all cases, but β-carotene synthesis to varying extents. This may be due to final pH values of the media.

Studies of fatty acid oxidation. 3. The effects of acyl-CoA complexes on fatty acid oxidation. J. Avigan, J. H. Quastel and P. G. Scholefield(Res. Inst., Montreal General Hospital, Montreal, Canada). *Biochem. J.* 60, 329–334(1955). The addition of fatty acids, such as butyric and octanoic, produces an inhibition of acetoacetate synthesis in extracts which are capable of forming acyl-CoA derivatives from fatty acids. Similar effects on sulphanilamide acetylation may also be obtained. Studies on the oxidation of carboxyl-labelled butyrate by respiring rat-liver mitochondria have confirmed the fact that other fatty acids may compete for the butyrate activating enzyme system and that, on oxidation of these fatty acids, isotopic dilution occurs. The addition of palmitate to rat-liver mitochondria in the presence of carboxy C^{14} butyrate results in a decrease in the amount of radioactive acetoacetate formed but had little effect on the amount of radioactive CO_2 produced.

Separation and determination of acetyl and lactic acids by paper partition chromatography and its application to silages. Y. Birk and A. Bondi(Animal Nutrition Lab., Agricultural Research Station, Rehovot, Israel). *The Analyst* 80, 454–457 (1955). A brief and simple paper-chromatographic method of determining and separating lactic acid from acetic acid in a mixture of volatile fatty acids and lactic acid is described. Spots of the ammonium salts of these acids were applied to two filter papers. One filter-paper was immediately transferred to the chromatographic chamber; the spots obtained after development giving the volatile fatty acids and the sum of acetic and lactic acids. The other filter paper was left at room temperature for several hours in order to permit the evaporation of the ammonium salts of the volatile fatty acids and then transferred to the chromatographic chamber. The spot obtained after development was due to lactic acid only. This method has been satisfactorily applied to silages.

Physiological properties of the saponifiable fraction of fish and whale oils. P. Creac'h. *Oleagineux* 10, 161–168(1955). Physiological studies on the saponifiables of fish and whale oils are reviewed.

The oil and press cake of ricinodendron rautanenii. J. Adrian, A. Rerat and J. Xabrecas. *Oleagineux* 10, 481–487(1955). Nutrition studies were conducted on the oil and press cake obtained by crushing the kernels from the fruit of the manketti tree (*Ricinodendron rautanenii*). As previous investigators have shown, the kernels were found to contain more than 50% of a semi-drying oil suitable for use in paints and food. The press cake was characterized by a high protein content (50 to 60%), a mineral content of nearly 10%, a low concentration of vitamin B and a high cellulose content of 8%. The ash from the press cake had a calcium-phosphorus ratio of 5.0, and contained considerable potassium and no iron. Analytical studies and tests with rats indicated that the proteins of the press cake of the manketti have a satisfactory amino acid balance and biologically are as efficient as those from peanut press cakes.

Studies on the conjugated lipides. VI. On the structure of inositol phospholipide. E. Okuhara and T. Nakayama(Dept. of Medical Chem., School of Medicine, Hokkaido Univ., Hokkaido, Japan). *J. Biol. Chem.* 215, 295–302(1955). The so-called inositol phospholipide from commercial soybean lecithin fraction has been isolated and subjected to Purdie's exhaustive methylation procedure, giving hexamethylglycerophosphoinositide. Hydrolysis of this substance yielded myristic acid, oleic acid, pentamethyl inositol, glycerol, and phosphoric acid. Among inositol-containing phospholipides, which many workers up to the present have tried to separate from the fraction of soy bean phospholipides, it is certain that there exists a compound having a phosphatidic acid-like structure and which has no nitrogenous base.

Tocopherol as an activator of cytochrome C reductase. A. Nason and I. Lehman(McCollum-Pratt Inst., Johns Hopkins Univ., Baltimore, Md.). *Science* 122, 19–22(1955). These experiments have demonstrated with purified particulate or solubilized preparations from rat skeletal muscle that tocopherol can specifically function as an activator in the enzymatic reduction of cytochrome c by reduced diphosphopyridine nucleotide (DPNH). The reduction of cytochrome c by succinate in the presence of a particulate preparation from the same source has also been shown to have a tocopherol requirement.

The stability of vitamin A in mixed feeds and premixes. B. Reid, H. Daugherty and J. Couch(Depts. of Poultry Husbandry and Biochem. and Nutrition, Texas Agr. Exp. Sta., College Station, Tex.). *Poultry Sci.* 34, 603–608(1955). Data have been presented which show the stability of vitamin A from stabilized dry concentrate and a fish liver oil concentrate when mixed with several rations. There was a rapid loss of vitamin A activity from the fish liver oil in the feed, while stabilized dry concentrate retained in most cases more than 85% of the vitamin A potency throughout the four-month storage period in all rations.

The utilization of fats of different melting points added to broiler feed. D. Carver, E. Rice, R. Gray, and P. Mone(Swift & Co., Research Labs., Chicago, Ill.). *Poultry Sci.* 34, 544–546 (1955). The extent of absorption by the chick of oleic acid, tallow, hydrogenated tallow and fatty acids from hydrogenated tallow has been determined. Neither hydrogenated tallow nor hydrogenated tallow fatty acids are efficiently utilized as fat supplements to broiler feed. Unmodified tallow is well absorbed—to the extent of 82 to 100%.

Arterial synthesis of cholesterol in vitro from labeled acetate. Nancy F. Eisley, G. H. Pritham(Dept. of Agr. and Bio. Chem., Penn. State Univ., University Park). *Science* 121, 1(1955). The results of this study verify earlier investigations that implicated the aorta in the synthesis of cholesterol. The conversion of C^{14}-labeled acetate into cholesterol by aorta mince ranged from 1 to 69% of that produced by liver homogenates from the same amounts of acetate. Although the aorta appears to be less active than the liver in cholesterol synthesis, it may nevertheless be an important factor in the development of atherosclerosis.

The structure of cerebroside sulfuric ester of beef brain. S. Thannhauser, J. Fellig, and G. Schmidt(Research Lab. of the Boston Dispensary, New England Med. Center, Tufts College Med. School, Boston, Mass.). *J. Biol. Chem.* 215, 211–216 (1955). A method for the preparation of cerebroside sulfuric ester is described. The position of the sulfuric acid group in cerebroside sulfuric ester was shown to be on the primary hydroxyl of carbon atom 6 of the galactose moiety of the molecule.

Studies on carbohydrate metabolism in rat liver slices. V. Glycerol metabolism in relation to other substrates in normal and diabetic tissue. J. Ashmore, A. Renold, Frances Nesbett, and A. Hastings(Dept. of Biological Chem., Harvard Med. School, Boston, Mass.). *J. Biol. Chem.* 215, 153–161(1955). The metabolism of glycerol-α-C^{14} in liver slices from normal and diabetic rats has been compared with that of glucose, fructose, and pyruvate. All four substrates exhibit the same general metabolic pattern. In addition to a diminished utilization of glucose, liver slices from diabetic rats produced more glucose and less glycogen from each of these substrates than did normal liver tissue. The metabolism of diabetic liver tissue could be returned to normal by the injection of insulin prior to the sacrifice of the animal.

Clearing factor, a heparin-activated lipoprotein lipase. I. Isolation and characterization of the enzyme from normal rat heart. E. D. Korn(Lab. of Cellular Physiology, National Heart Inst., U. S. Public Health Service, Bethesda, Md.). *J. Biol. Chem.* 215, 1–14(1955). Clearing factor, the enzyme present in postheparin plasma, can be extracted from acetone powders of normal rat hearts. This enzyme catalyzes the hydrolysis of the neutral fat of chylomicrons. It is activated by heparin and inhibited by salt and protamine. A fatty acid acceptor is also required. The distribution of the enzyme in other tissues and the effect of heparin administration on the concentration of enzyme in the heart have been investigated.

II. Substrate specificity and activation of coconut oil. *Ibid.* 215, 15–26(1955). It was demonstrated that lipoprotein lipase will catalyze the hydrolysis of triglycerides only when they are associated with protein. Coconut oil can interact with lipoproteins to form a lipide-protein complex which is an active substrate for the enzyme. These phenomena have been discussed from the point of view of chylomicron formation and fat transport mechanisms.

The modes of action of vitamin A. R. A. Morton(Dept. Biochem., Univ. Liverpool). *J. Sci. Food Agr.* 6, 349–56(1955). The chemistry and biochemistry of vitamin A's, the chemistry and biochemistry of vision, and the systemic actions of vitamin A are reviewed.

Attempted induction of microbial mutants requiring steroidal growth factors. E. A. Adelberg, Priscilla A. Roslansky, J. W. Myers, and C. A. Coughlin(Dept. Bacteriology, Univ. California, Berkeley). *J. Bacteriology* 69, 733(1955)—Note. Unsuccessful attempts are described to induce or isolate steroid-requiring microbial mutants of *Escherichia coli* and *Saccharomyces cerevisiae*. Steroids used were diethylstilbestrol, testosterone, cortisone and its acetate, desoxycorticosterone and its acetate, progesterone, pregnenolone and dehydroisoandrosterone.

Synthesis of lipids in resting cells of Saccharomyces cerevisiae. H. P. Klein(Dept. Microbiol., School of Med., Univ. Washington, Seattle). *J. Bacteriology* 69, 620–7(1955). *Saccharomyces cerevisiae* were grown on three types of media under aerobic and anaerobic conditions. Cells harvested after anaerobic growth contained less sterol and fatty acid than those grown aerobically on the same type of medium. The unsaponifiable fraction from anaerobic cells contained 80 to 90% hydrocarbons whereas from aerobic cells sterols (ergosterol) comprised 65 to 70% of the total unsaponifiables. Aeration of resting suspensions of anaerobic cells on phosphate buffer resulted in synthesis of fatty acids and a 3- to 8-fold increase in sterol content within 8 hours but no significant increase in total unsaponifiable matter. Addition of acetate to this system caused no additional increase in lipid formation but under the same conditions glucose stimulated the synthesis of large amounts of lipids. Experiments with tagged glucose showed that it is the precursor for the newly synthesized ergosterol and fatty acids. The possibility is discussed that delayed utilization of acetate for lipid synthesis may be the result of slow adaptation of the anaerobic cells to oxidation of acetate. The possible relationship between these lipids and respiratory enzymes is discussed briefly.

A new device for micro-recrystallizations. J. H. Cannon (Food & Drug Admin., Dept. Health, Educ. and Welfare, St. Louis 1, Mo.). *J. Assoc. Off. Agr. Chemists* 38, 844(1955)—Note. An apparatus is described for recrystallization of minute amounts of precipitates such as are obtained in the sterol acetate method for detecting vegetable sterols in butter.

Fluorometric determination of Δ^4-3-ketosteroids. D. Abelson and P. K. Bondy (Dept. Physiology, Yale Univ. School of Medicine, New Haven, Conn.). *Arch. Biochem. Biophys.* 57, 208–217(1955). A simple fluorometric procedure for the quantitative estimation of Δ^4-3-ketosteroids is described, based on the reaction with potassium *tert*-butoxide in *tert*-butyl alcohol. The method is applicable to the determination of testosterone, progesterone, and the biologically active adrenocortical C_{21} steroids, and is sensitive to 0.01 microgram of steroid.

Report on the determination of vitamin A in margarine. Preparation of alumina adsorbent. K. Morgareidge (Food Res. Labs., Inc., 48–14 Thirty-Third St., Long Island City, N. Y.). *J. Assoc. Off. Agr. Chemists* 38, 688–92(1955). The following factors affecting the activity of alumina adsorbents for estimating vitamin A in margarine are discussed: type and source of alumina, particle size, heat treatment, alkali treatment, and moisture content. Further work is necessary to prepare a suitably standardized alkaline alumina for the single column assay procedure, but may not be justified in view of the apparent success of the tandem (two column) method employing two different grades of aluminas.

Report on the egg content of noodles. V. E. Munsey (Div. Food, Food & Drug Admin., Dept. Health, Educ. and Welfare, Washington 25, D. C.). *J. Asoc. Off. Agr. Chemists* 38, 572–6(1955). A collaborative comparison is reported on two methods for the determination of egg solids in noodles: the official cholesterol method (bromination) and a slight modification of the sterol-digitonin method used in the collaborative study last year. It is recommended that the sterol-digitonin method be adopted as official.

Report on vitamin A in mixed feeds. D. B. Parrish (Kansas State College, Manhattan, Kansas). *J. Assoc. Off. Agr. Chemists* 38, 692–4(1955). In view of the increasing use of stabilized vitamin A preparations in feeds, the associate referee discusses the need for a single procedure by which all forms of vitamin A may be determined.

Report on carotene. F. W. Quackenbush (Dept. Biochem., Purdue Univ., Lafayette, Ind.). *J. Assoc. Off. Agr. Chemists* 38, 694–5(1955). An extraction procedure for isolating carotenes from fresh and ensiled plant materials is recommended. Work is in progress on developing a method for the determination of carotene isomers and on studying effects on carotene analysis of adding fats to alfalfa meals.

Report on xanthophyll in mixed feeds. C. R. Thompson (Western Utilization Res. Branch., Agr. Res. Service, U. S. Dept. Agr., Albany 6, Calif.). *J. Assoc. Off. Agr. Chemists* 38, 695–7(1955). Chromatographic analysis showed that lutein, violaxanthin, cryptoxanthin, zeaxanthin and neoxanthin comprise 99% of the xanthophyll fraction isolated from fresh alfalfa. Seven minor bands were also seen. The same five pigments comprised 87% of the xanthophylls from dehydrated alfalfa meal. However, at least 40 bands were present in the chromatograms from dehydrated alfalfa. Two previously reported methods [J.A.O.A.C. 37, 894(1954)] for the determination of carotenes and xanthophylls in a single sample are reviewed.

Vitamin A preparations. M. K. Koffler. *U. S. 2,716,064.* Stabilized vitamin A preparations are obtained by mixing an animal source vitamin A with concentrated citrus fruit peel juice.

• Waxes

R. L. Broadhead, Abstractor

Treating refined sugar-cane wax and products resulting therefrom. E. A. Wilder and E. H. McMullen (S. C. Johnson & Son, Inc.). *U. S. 2,703,807.* Sugar-cane wax refined to the extent that at least 97% of the wax was soluble in Me_2CHOH was further purified by blowing air through the molten wax at 92°. (*C. A.* 49, 8624)

Characteristics of the wax from esparto (Stipa tenacissima). A. Soler and G. Guzman. *Anales real soc. espan. fis. y quim. (Madrid)* 50B, 769–78; *Publ. inst. quim. "Alonso Barba" (Madrid)* 8, 245–54(1954). Of solvents tested for the extraction of esparto wax, 1:1 EtOH-C_6H_6, Et_2O, C_2HCl_3, 96% EtOH, C_6H_6 and 2:1 EtOH-C_6H_6, the first gave the best yield, 4.9%; the yield was somewhat higher with finely divided than with coarse esparto. The crude wax softened at 63.5–64.0°; a sample freed from resin softened at 68°. Solidification temperature of the resin-free wax was 70.5°. Crude wax had d. 1.105–1.125; resin-free wax, 1.005–0.998; refined commercial wax, 0.951–0.962. Iodine number of the crude wax was 27.2; of the resin-free wax, 10.2. The acids and the alcohols of esparto wax have longer C chains than do those of Chinese wax. The content of unsaponifiable matter is somewhat lower than that given in the literature. There is present a saturated hydrocarbon of 31 or 32 C atoms.

The fatty material of jute fiber. H. Chatterjee (Indian Central Jute Committee, Calcutta). *Fibres—Nat. and Synthet.* 15, 343–5(1954). Analyses of the Indian crop showed that, on extraction with dry alcohol-benzene (1:1), the jute fiber yields a heterogeneous material containing the natural fat and wax, as well as components of fat-like nature, coloring matter, etc. Preliminary observations on the probable combination in which N, P, etc., occur in the extractive material are described. Results are tabulated. (*C. A.* 49, 9280)

Preparation of primary reference fuel cetane for cetane number determinations. II. Primary reference fuel cetane from Japan wax. Ryo Kato (Kanto-Kagaku Chem. Ind. Co. Ltd., Tokyo). *J. Fuel Soc. Japan* 34, 82–95(1955); cf. *C. A.* 49, 6485e. Japan wax (m. 45.5–53.5°, acid number 11.32, saponification number 201.66 I no. 13.86) obtained from *Rhus sylvestris* was treated repeatedly during 12 hours with MeOH containing 5% HCl to obtain a crude Me palmitate (I). Five samples of I of varying purity were prepared by modifications of the distillation or recrystallization procedure, and each sample was hydrogenated at 330° for 5 hours in the presence of 5% MoS_3 catalyst at an initial H pressure of approximately 100 atmospheres. Distillation of the resulting oil gave cetane (II) with a maximum yield of approximately 77%. Comparison of the properties of II with a comparable U. S. standard sample showed almost entire identity. Experiments on the correlations of the number of C atoms in hydrocarbons with aniline point and cetane number are described and the mechanism of the formulation of II from I is discussed. (*C. A.* 49, 8591)

• Drying Oils and Paints

Raymond Paschke, Abstractor

Some new compounds of unsaturated fatty acids with typical metals: Their preparation and properties. J. H. Skellon and K. E. Andrews (Acton Tech. College, London). *J. Appl. Chem.* 5, 245(1955). Metal soaps of erucic and petroselinic acids were investigated with particular reference to their effect on rates of autoxidation.

Polystyrene: A review. M. R. Vaidya and S. L. Kapur (Nat. Chem. Lab., Poona). *Paintindia* 5(3), 23(1955). The history, preparation, and applications are discussed.

Aerosol paint formulation. C. A. Southby (Safco Aerosol Manuf. Ltd. England). *Paint Technol.* 19, 233(1955). The problems involved in packaging and formulating paints in aerosol form are given. Close collaboration between the manufacturer and packager are most important.

Fish oils in the varnish industry. C. Salvi. *Pitture e vernici* 11, 37–42(1955). The methods to improve fish oils, to eliminate the disagreeable odor, and to increase drying ability are reviewed. (*C. A.* 49, 9937)

Flame-retardent plasticizer for protective coatings. R. J. Polack and E. H. Holmstrom (Celanese Corp.). *Paint Varnish Production* 45(9), 35(1955). Application of tris *beta*-chloroethyl phosphate are discussed.

Chromatographic analysis of varnish. Germana Liotta-Vandone. *Pitture e vernici* 11, 171–5(1955). A review. (*C. A.* 49, 9937)

Tall oil or liquid rosin. T. Jakobson. *Svensk Papperstiding* 57, 883–4(1954); 58, 16–19(1955). Abstracts of recent literature.

Flame photometry and spectrophotometry. D. S. Cox (Sherwin-Williams Corp., Montreal). *Paint Varnish Production* 45(9), 30(1955). Applications in paint analysis and control are reviewed.

Fire retardent paints—Part III. W. Brushwell. *Am. Paint J.* 39(48), 74(1955). A review of the present status of fire retardent paints for both cellulosic and metal surfaces. Formulation and testing are discussed.

Lanolin in putty. C. A. Acaster (Croda Ltd., Snaith, Eng.). *Oil Colour Chemists' Assoc. J.* 38, 359(1955). Replacement of half of the linseed oil in putty with lanolin improves storage stability and durability. A slight change in manufacturing technique is required. The product is harder to handle in cold weather.

Pigments, paints, varnishes, and lacquers. Anon. *Paint Oil Colour J.* 128, 265(1955). Answers to the 1954 City and Guilds' examination questions are given.

Catalytic conversion of linseed oil to stand oil. R. Montequi and F. J. Lopez Morales(Inst. "Alonso Barba," Madrid). *Anales real soc. espan. fis. y quim.* 50B, 859–64(1954). Refined linseed oil was polymerized at 295–300° under CO_2. Catalysts promoted conjugation and increased polymerization rates. Anthraquinone and $(C_6H_5 \cdot CH_2S)_2S$ were most effective. Zinc resinate and Superbeckacite resin 1001 were least active. The latter gave good water resistance. (*C. A.* 49, 9937)

Analytical study of polymerized linseed oils, experimental work. H. Vaillant. *Revue Francaise des Corps Gras.* 2, 394–405 (1955). Ultraviolet spectrophotometric studies were made on alkali-isomerized stand oils and four commercial samples of linseed stand oils with viscosities ranging from 6 to 300 poises. The same ultraviolet technique was used to follow laboratory runs. Mixtures of linseed oil and corn oil were used to obtain curves which showed the changes in the characteristic absorption at 268 mμ as the linolenic-linoleic acid ratio varied. From the limited results it seemed possible to conclude that conjugated dienes form during the standolization of linseed oil. The diene content passes through a maximum (about 5% for stand oils of a viscosity of 6 poises) and then decreases progressively as the polymerization proceeds. At the start of the standolization the linoleic acid seems to disappear more rapidly than the linolenic acid but as soon as the viscosity exceeds 1 poise the linolenic acid polymerizes and disappears seven times as rapidly as linoleic acid. Above a viscosity of 60 poises the rate of polymerization of the two acids is comparable.

• Detergents

Lenore Petschaft Africk, Abstractor

The evaluation of commercial alkyl sulfates. R. H. Crockett (County Labs., Ltd., Honeypot Lane, Stanmore, Middlesex, Engl.). *J. Soc. Cosmetic Chemists* 6, 124–9(1955). Analytical methods for the analysis of detergents for alkyl sulfates are detailed.

Medicated soaps. H. Goldschmiedt(Mem Co., New York). *Soap and Chem. Specialties* 31(8), 40–2, 114(1955). The various types of medicated soaps are described. These include albumen soap, silicone acid soap, oxygen releasing soap, hexachlorophene soap, tar and sulfur soap, and naphthalene soaps.

Iogeneity(ion-activity) of interface active compounds and its influence in wetting. W. Kling(Boehme Fettchem.G.m.b.H., Dusseldorf, Ger.). *Melliand Textilber.* 36, 166–73(1955). Electroosmotic and electrophoretic measurements show that the negative charge which builds upon fibers in water can be increased by anionic surfactants, remains almost unchanged by nonionics, and is greatly reduced and changed into a positive charge with higher concentrations of cationics. In the washing process anionic detergents cause an increase of the negative charge of fiber and soil; this increases their repellent action for one another, and improves detergent action. With cationics, a reversal of the charge may occur on the fiber only which leads to a redeposition of soil on the fabric. Detergency of nonionics cannot be explained by the charges that build up in water. Charges also play a part in dyeing, matting of rayon, and in other finishing processes. (*C. A.* 49, 10641)

The action of oxidative detergents on cotton fabrics. Macromolecular compounds. H. Krassig. *Melliand Textilber.* 36, 55–8, 163–6, 265–7(1955). Literature data referring to the effect of oxygen and alkali on cellulose are reviewed, and the behavior of various textile materials to the same washing conditions, the extent of fiber damage in dependence of the active oxygen content in the wash liquors, the effect of stabilizers, and the effects of washing treatments on the breaking strength and dry tearing strength, as well as on the morphological characteristics of the fiber, are briefly discussed. Experimental results show that, when evaluating the damages to cellulose fabrics occurring during washing and the quality and efficiency of detergents, it is of advantage to include also measurements (degree of polymerization and viscosity) on nitrated washed samples.

Eczema from washing compounds. I. P. Kroepfli and R. Schuppli. *Dermatologica* 110, 1–7(1955). Ni and Cr compounds gave positive skin irritation tests on women who had developed eczemas from using certain commercial powdered washing compounds, the inference being that these products contain irritating amounts of such elements. Five out of 8 cement workers with eczema were sensitized to these same compounds of Ni and Cr. (*C. A.* 49, 8619)

The adsorption of surface-active agents at solid-liquid interfaces. J. L. Moilliet. *J. Oil & Colour Chemists Assoc.* 38, 463–73(1955). Some of the special features of the adsorption of surface-active agents at solid-liquid interfaces are discussed and illustrated. These include the possibility of adsorption with reversed orientation, which is compared with amphipathic adsorption, and the possible formation of pseudoadsorbed layers, to which the Biggs thermodynamical treatment cannot be applied. The concept of the interfacial tension at solid-liquid interfaces, and the effect thereon of the adsorption of surface-active materials are also examined. Practical effects which are achieved by the adsorption of surface-active agents at solid-liquid interfaces are briefly summarized.

The place of soap in the field of household detergents. M. Naudet(Fac. sci., Marseille). *Rev. franc. corps gras* 2, 313–22 (1955). The different aspects (detergency, physiological effects, etc.) of syndets vs. soaps are discussed. Further improvement of the soaps by addition of products inhibiting precipitation of Ca and Mg salts seems possible. (*C. A.* 49, 10641)

Developments in soapmaking. E. H. Palmason(Unilever Ltd., Port Sunlight, Cheshire, Engl.). *Chemistry & Industry* 1955, 722–6. The development of the soap industry is reviewed starting with the early history, continuing with the pan and kettle methods, and covering such modern methods as Crosfield's continuous system, Monsavon, Sharples, Krebitz, "Continuous autoclave system," and Clayton high-pressure saponification.

The detergent action as a function of time. M. Rosch. *Melliand Textilber.* 36, 58–63(1955). Washing tests show that, in agreement with the findings by others, optimum results are obtained in about 6–10 minutes. After reaching the optimum, the detergent effect remains more or less constant in the case of alkaline and neutral wool scouring and neutral acid cotton washing. With the exception of anionic fatty acid condensation products (of the Igepon T type) and polyglycolether derivatives, the wash effect of anionic detergents decreases after 8 minutes during acid wool scouring; this is attributed to the re-absorption of dirt loaded detergent particles by the fiber. Pigment- and oil-soils show similar results but the effects are less distinct with oil soils than with pigment soils.

Development of a detergent test. W. B. Smith and A. Taylor (Marchon Products, Ltd., Whitehaven, Cumberland, Engl.). *J. Soc. Cosmetic Chemists* 6, 96–107(1955). The approach to the general problem of devising useful laboratory service tests is described using as an example the development of a test for a dishwashing detergent. The economy of effort and additional value of the results obtained by the use of a Factorial Design for the tests over those obtained from the Classical Method of examining the effect of changing each variable singly is emphasized. The results of the artificial soil test developed agree with those found with a natural soil test. Information is obtained regarding the best method of interpretation of the data, the repeatability of the test, and the effect of uncontrollable variables.

Effects of surface-acive agents on caking of stored mixed fertilizer. W. J. Tucker(G. L. F. Soil Building Laboratory, Ithaca, N. Y.). *J. Agr. Food Chem.* 3, 669–72(1955). An investigation was undertaken to determine the effectiveness of surfactants in reducing caking tendency and curing time of mixed fertilizers. Two liquid surfactants were tested. An anionic detergent, 38% solution of the sodium sulfate derivative of 2-ethyl-1-hexanol and a nonionic alkyl phenyl polyethylene glycol ether. No significant reduction in caking was caused by incorporating the surfactants in mixed fertilizer when the fertilizer was bagged within 1 week of manufacture and stored for over 3 weeks. The presence of an anionic surfactant did not reduce caking tendency when the fertilizer was cured for 4 weeks prior to bagging. Any benefits from the use of surfactants in mixed fertilizer manufacture are dependent upon many factors, including manufacturing methods, processing equipment, and raw materials.

Bactericidal and bacteriostatic powers of detergents. J. Vallee. *Teintex* 20, 92–101(1955). At 20° anionic and nonionic detergents do not exceed soap in bactericidal action, compared at

1 g. of active ingredient per liter and 15 min. wash. Under the same conditions at 60° a positive bactericidal action on *Staph. aureus* and *B. coli* is evident. At 90° a positive action against *B. subtilis* develops, but the temperature alone is sufficient to kill the other two organisms. No connection between the bactericidal power and the pH of the synthetic detergents was noted. The latter were normally found to be sterile in the concentration as sold as was 72% cake soap.

Adsorption and deposition of carbon on cotton from solutions of sodium dodecyl sulfate. R. S. Vold and A. K. Phansalkar. *Rec. trav. chim.* **74**, 41–51(1955). The ability of sodium dodecyl sulfate solutions to alter the tendency of oil-free carbon to deposit on cotton cloth is studied and an attempt is made to correlate the concentration and degree of association of the surface-active agent, the particle size of the suspended carbon and the adsorption of the surface-active agent by both the carbon and cloth. The optimum concentration for preventing the deposition of carbon was found to be far below the critical micelle concentration, and maximum protection is reached before sufficient surface-active agent is adsorbed to form a condensed monolayer, the suspendability of the carbon in the detergent solution being unrelated to the *zeta*-potential. Various explanations for the inflection in the adsorption isotherm of sodium dodecyl sulfate are reviewed.

Color change of bromophenol blue in the presence of quaternary ammonium salts. H. A. Zutrauen and Lisbeth Ter Minassian-Saraga. *Compt. rend.* **240**, 869–71(1955). An attempt is made to elucidate the mechanisms involved in the use of colored indicators for determining the critical micelle concentration of certain cationic detergents. For this purpose, solutions of lauryl, myristyl, and cetylmethylammonium bromide (pH practically the same as that of pure water) were studied over a wide range of concentrations in the presence of the same quantity of bromophenol blue, and their absorption was measured spectrophotometrically. Results show that the color change of the indicator takes place not at the critical micelle concentration but at a certain concentration characteristic for the respective detergent, independently of salt content of the solutions.

Thiocarbazone and thiuram compounds in detergent compositions. H. S. Sylvester(Colgate-Palmolive Co.). *U. S. 2,706,180.* A detergent composition normally tending in water to cause tarnishing of a copper base alloy consists of water-soluble anionic organic sulfate and sulfonate detergents, water-soluble inorganic polyphosphate and a small amount of a tarnishing inhibitor selected from the group consisting of lower aliphatic and aryl thiocarbazones and thiuram sulfides sufficient to inhibit said tarnishing.

Toilet soap and process of preparing same. R. F. Heald(Colgate-Palmolive Co.). *U. S. 2,704,279.* An improved and essentially unbuilt milled toilet soap in bar or cake form consists essentially of at least about 60% of anhydrous water-soluble metallic salts of higher fatty acids with about 4 to 30% of water-soluble higher fatty acid monoglyceride monosulfate detergent uniformly dispersed throughout, and about 5 to 15% moisture.

Detergent composition containing caking preventive. A. H. Lewis and D. F. Searle(California Research Corp.). *U. S. 2,709,684.* It has been found that the degree of caking of particle-form solid detergent compositions containing sodium C$_9$ to C$_{18}$ monoalkyl benzene sulfonate as their primary detergent ingredient can be reduced by adding from about 1.0% to about 10.0% by weight of a sodium salt of monohydroxybenzene sulfonic acids. *U. S. 2,709,685.* This patent adds about 1.0% to about 10.0% by weight of a sodium salt of monochlorobenzene sulfonic acid to prevent caking. *U. S. 2,709,686.* This patent adds about 1.0 to 10.0% by weight of a sodium 2-hydroxy alkane sulfonate to prevent caking. *U. S. 2,709,687.* This patent adds about 0.5 to 10.0% by weight of sodium salts of saturated aliphatic sulfonic acids to prevent caking.

Improvements in the manufacture of soap tablets. British Glues and Chemicals Ltd. *Brit. 723,361.* Soap tablets are manufactured by subjecting partially dried soap to treatment in a soap mill or plodder or both thereby converting it from the *alpha* phase to the *beta* phase, then adding water to it, mixing the mass, and then forming it into tablets.

Improvements in detergents. Marchon Products, Ltd. *Brit. 723,916.* Detergents having improved washing ability on cottons and non-saponaceous detergents comprising water-soluble salts of sulfated ethylene oxide condensates of the type having the hydrophobic portion of the molecule derived from a compound selected from the group consisting of fatty alcohols, fatty acids, fatty amides, fatty alkylolamides, alkyl phenols, alkyl naphthols and alkyl phenyl ethyl alcohols, combined with a compound produced by reacting an alkylolamine with a fatty acid such as a "Ninol" product.

Method for polishing soap. J. Garvey. *Brit. 724,173.* A polished bar of soap is formed by extruding a mass of soap through a forming plate having a cutting edge to form a bar of soap and advancing the formed bar of soap through a tubular support in sliding engagement with internal walls, thereof, exerting a shear stress from the internal walls upon the surface of the soap bar during such advance, and maintaining the soap bar surface at an elevated temperature adequate to produce a smooth glossy finish.

Soap compositions. Unilever Ltd. *Brit. 725,620.* A silicate-containing soap in granular form is treated with CO$_2$ to form silica on the surface of the particles thus producing a non-agglomerating granular product.

Production of surface active agents. W. J. Oldham and M. M. Wirth(The British Petroleum Co., Ltd.). *Brit. 728,433.* Surface active agents are produced by contacting a long chain alkyl hydroperoxide or an alkyl substituted naphthene hydroperoxide with sulfur dioxide in the presence of an aqueous and/or alcoholic medium and an inorganic or organic base so that the hydroperoxide or mixture of hydroperoxides is converted to a neutral salt of an alkyl hydrogen sulfate and/or a neutral salt of an alkyl substituted naphthene hydrogen sulfate.

Improvements in detergent compositions. V. Mills and B. Strain (Procter & Gamble Co.). *Brit. 728,503.* Liquid detergent compositions which are highly concentrated and stable against clouding, precipitation of solids, and gelling at temperatures as low as 50°F. consist of an ammonium synthetic anionic sulfonate or sulfate detergent which contains less than 10 per cent electrolyte, and soluble organic builder for sudsing such as a fatty acid amide of monoethanolamine and an aqueous alcohol vehicle adapted to dissolve completely the combination of detergent, electrolyte and amide.

Antiseptic soap composition. D. J. Beaver, R. S. Shumard, and P. J. Stoffel(Monsanto Chem. Co.). *U. S. 2,713,036.* An antiseptic detergent composition consists of a combination of a detergent soap and 0.5 to 10% by weight of a new tri-phenol compound, 4-halo-α,α'-bis(5-nitro-2-hydroxy-phenyl)-2,6-xylenol.

Improved detergent preparations. A. Blumenthal. *U. S. 2,714,093* and *Brit. 731,371.* A non-soapy detergent preparation, preferably of the alkylaryl sulfonate type in tablets or bars has the detergent incorporated in a binder comprising a combination of a normally solid higher aliphatic acid such as stearic acid, an ester gum and a wax having a melting point between 45° and 70°.

Improvements in or relating to the preparation of soaps. L. E. H. Fromont. *Brit. 729,568.* A hard, transparent soap with improved skin reaction properties is prepared by mixing a transparent alkali metal soap with the product obtained from the reaction of a soap-forming fatty acid containing at least 18 carbon atoms with excess triethanolamine.

New cationic surface-active agents and process for preparing them. S. A. Farmaceutici Italia. *Brit. 730,394.* Cationic detergent surface active agents with bacteriostatic and bactericidal activity consist of the salts of the alkyl ethers of 2,4-diguanidinephenol.

Improvements in soap powders. J. P. Parke(Unilever Ltd.). *Brit. 730,894.* More efficient and economical soap powders consist of soap, of which at least 50% by weight is derived from unsaturated soap-forming acids, in admixture with sodium or potassium carbonate, and disodium or dipotassium orthophosphate, the carbonate and orthophosphate being in such condition, that, when the powder is added to water, they dissolved before an appreciable amount of soap has dissolved, thus removing the hardness of the water.

Improved detergent compositions. Unilever Ltd. *Brit. 731,396.* A process for the preparation of shaped organic soapless detergent compositions comprises dissolving gelatin, with heating, in a solution of a water-soluble salt of an organic sulfonic acid or of an aliphatic sulfuric acid ester having detergent properties, the quantity of gelatin being such that the product obtained by cooling the solution is solid, the product being shaped at the same time, or after cooling.