evidence that the enzyme probably is involved in its formation.

The levorotation of the polymer in contrast to the dextrarotation of the reduced hydroperoxides may be explained on the basis of the observation of Levine and Marker (9) that when a large radical is attached to the asymmetric molecule in place of a relatively small group, direction of rotation may be reversed.

The probability that lipoxidase will attack only the *cis, cis* form of the 1,4-pentadiene system is further supported by the finding that *cis*-9, *trans*-12, and *trans*-9, *trans*-12-octadecadienoates were not oxidized. It is interesting to note, whether it be biologically significant or mere coincidence, that the *cis*-1, *cis*-4-pentadiene system for which lipoxidase is specific, is also essential to biological activity of the so-called essential fatty acids.

Summary

Studies of products formed in the lipoxidase-catalyzed oxidation of linoleates have been made by physical and chemical measurements directly on the oxidized substrate, on concentrates of the oxidized fraction, and on reduced and esterified products of the oxidized fraction. The following principal observations and conclusions have been reached:

a) The principal products obtained in the oxidation of aqueous solutions of sodium linoleate are optically active *cis, trans* conjugated monomeric monohydroperoxides. This was found true whether the oxidations were conducted at 0° or 26°C., in either daylight or darkness.

b) Other products of the enzymatic reaction were optically active polymers, and these were formed in greater proportions at higher concentrations of enzyme and at higher oxidation temperatures. The polymers contained added oxygen in an apparently constant proportion, irrespective of the conditions of oxidation, but conjugated diene which was also present in the polymer was more variable.

c) The formation of hydroperoxides was predominantly substantiated by polarographic analysis. It was further found however that when peroxide concentrates from the lipoxidase reaction were kept at room temperature for any appreciable time, they underwent a relatively marked change in their half-wave potential, the nature of which was not readily apparent.

d) The results further substantiate a previously proposed mechanism (15) for the lipoxidase reaction in which the enzyme is considered to be involved in the formation of each peroxide molecule. The mechanism may be extended to account for the formation of optically active polymeric products.

e) Lipoxidase was inactive with respect to the *cis*-9, *trans*-12, and *trans*-9, *trans*-12-isomers of natural linoleic acid.

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ABSTRACTS . . . .

R. A. Reiners, Editor

• Oils and Fats

Ralph W. Planck, Abstractor
Dorothy M. Rathmann, Abstractor
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Canadian Chemical Processing Annual Review of the Chemicals and Allied Industries. H. McLeod(Dominion Bureau of Statistics). *Can. Chem. Proc.* 39(6), 8-28(1955). Statistics for 1953-54 are given in this article.

Chemicals from castor oil. B. Henderson. (No address.) *Can. Chem. Proc.* 39(10), 94-98(1954). Chemicals produced from castor oil are discussed.

Purification of fatty acids. K. T. Achaya, S. A. Saletore, and S. H. Zaheer. *Indian 48,934,* 1955. Peanut oil mixed fatty acids (4.38 g.) are placed in a beaker to which is slowly added with stirring during the course of an hour, a saturated solution of 12 g. urea in 80% EtOH. The precipitate formed is filtered and washed with a little saturated urea-MeOH solution. The precipitate is then placed in a beaker with excess H_2O, slightly acidulated with mineral acid, boiled for a short time, and cooled. The fatty acids which separate are isolated with the help of a separatory funnel. The filtrate and washings are mixed and freed of the solvent by distillation. Then the fatty acids are recovered from the mixture with excess H_2O as above (*C. A.* 49, 8620)

Linden-tree fruits as a source of oil. M. Dima, Gh. V. Cotrut, and E. Diaconescu. *Acad. Rep. Populare Romîne, Studii Cercetări Chim.* 2, 89-102(1954) (French summary). Linden tree fruits contain 11-12% of the fatty oil suitable for food or industrial use. The oil contained: solid fatty acids 6.64, oleic acid 38.4, α-linoleic acid 30.53, β-linoleic acid 18.98, glycerol (as C_3H_5) 4.36, nonsaponifiable materials 0.59%. (*C. A.* 49, 8616)

The oxidation process of vegetable oils. Solubility variations of oxidized oils in furfural. E. Angelescu and F. Esanu(Univ. Bucharest, Rumania). *Acad. Rep. Populare Romîne, Studii Cercetări Chim.* 2, 27-37(1954)(French summary). Reciprocal solubilities of C_4H_3OCHO and sunflower oil (in the process of being oxidized) were examined. During the autoxidation of sunflower oil at elevated temperatures its critical solubility in furfural was augmented because of the formation of polar groups and simultaneously lowered because of condensation or polymerization. As a result the solubility changes were so small that they did not lend themselves for purposes of controlling the oxidation. However, the ''furfural point'' e.g. the solubility of 1 part of oil in 2 parts of furfural gave indications that it might be applicable for this purpose (*C. A.* 49, 8615)

Effect of some antioxidants on the weight change of linoleic and linolenic acids and their derivatives in the course of autoxidation. Y. Toyama and Y. Hirabayashi. *Mem. Fac. Eng. Magaya Univ.* 6, 59-62(1954). Based on weight change of films of linoleic and linolenic acids and their derivatives, exposed to indoor atmosphere, the effectiveness of the antioxidants were in the order: pyrogallol > pyrocatechol > α-naphthol > β-naphthol > hydroquinone > resorcinol > thymol > β-naphthylamine > diphenylamine > *p*-toluidine. (*C. A.* 49, 8614)

Preparation and utilization of alginic acid derivatives. IV. The palmitoylation of alginic acid by the modified Schotten-Baumann process. Y. Abe and T. Ihara(Keio-Gijuku Univ., Tokyo). *Bull. Japan. Soc. Sci. Fisheries* 19, 737-40(1953). Na alginate (5 g.) in 500 cc. water at pH 9 was added to 5 g. palmitoyl chloride in 50 g. ether dropwise while stirring at 300 r.p.m., allowed to stand, adjusted to pH 2.5-3.0 with *N* HCl, heated at 70° for 30 min., filtered and washed with water till no more Cl ion was detected, dried at 60°, and extracted with ether for 48 hrs. to remove fatty acid. The purity of the palmitoyl chloride influenced the amount of the fatty acid which combined with the alginic acid. (*C. A.* 49, 8105)

Investigation of the external parts of the skin for unsaturated fatty acids. H. E. Kleine-Natrop and A. Geraner(Univ. Kiel, Germany). *Hautarzt* 4, 273-5(1953). Analysis of 15 samples showed that the content of unsaturated fatty acids of the derma externa is more than in codliver oil. (*C. A.* 49, 8341)

Preparation of glycerol monoricinoleate. Roberto Bozzola(Lab. Farnova, Novara, Italy). *Boll. chim. farm.* 93, 199-203(1954). Heating ricinoleic acid with glycerol 8 hrs. at 190-200°/300 mm. with H_3PO_4 as a catalyst gives the monoricinoleate which is purified by washing with H_2O and dissolving in Et_2O; it is odorless, yellow, soluble in EtOH, Et_2O, $CHCl_3$, Me_2CO, and AcOEt, insoluble in petroleum ether, forms emulsions with H_2O and has d_{15} 0.99-1.01, saponification no. 155-60, iodine value 70-75. It is useful as an emulsifier. (*C. A.* 49, 8111)

Reactions of halogens with the metallic salts of fatty acids. III. Reactions of bromine with the silver salt of several carboxylic acids including some unsaturated acids. E. Maekawa. *Bull. Nagoya Inst. Tech.* 5, 310-13(1953). Reactions of Br with the Ag salts of oleic, 9,10-dibromostearic, cinnamic, 2-dodecenoic, and benzoic acids in CCl_4 are studied. It is generally difficult to obtain 1-bromoheptadecene and 1,8,9-tribromoheptadecane directly from oleic acid except in a few cases. To produce 1-bromoheptadecene from 9,10-dibromostearic acid it is desirable to prepare the Ag salt and to conduct the reaction below 0°. From α,β-unsaturated acids 1-bromo-1-alkanes are obtained. α-Hydrogens do not take part in the reaction. The indices of refraction, densities, and b. ps. under various pressures of C_7 through C_{15} 1-bromoalkanes having an odd number of C atoms are given. (*C. A.* 49, 8105)

Antioxidant action of melanoidins. I. Cl. Franzke and H. Iwainsky(Humbolt Univ., Berlin). *Deut. Lebensm.-Rundschau* 50, 251-5(1954). In 0.5% concentrations 3 melanoidins tested in margarine, which was then heated for various periods, inhibited an increase in Lea nos. more markedly than did 0.01% additions of dodecyl gallate, tetraethylthiuram disulfide, nordihydroguaiaretic acid or 1,7-naphthalenediol. Lower concentrations of the melanoidins (0.05%) were less effective than similar concentrations of other antioxidants. (*C. A.* 49, 8617)

Highly unsaturated acids in sardine oil. XX. Ultraviolet absorption measurements of some highly conjugated acids obtained by the alkali isomerization of clupanodonic acid and mixtures of clupanodonic and docosahexaenoic acids. Y. Toyama and T. Shimooka. *Mem. Fac. Eng. Nagoya Univ.* 6, 42-7(1954). Clupanodonic acid was separated from sardine oil and alkali isomerized. Separation of the solid acids by crystallization yielded a fraction, m. 114-6°, with extinction coefficients of 222.4, 253.9, 223.5, and 33.0, resp., at 316, 330, 346, and 374 mμ. This indicated the acid is predominantly conjugated pentaene and tetraene. A highly conjugated acid fraction, m. 124-6°, obtained from an alkali-isomerized, 1:2 mixture of clupanodonic and docosahexaenoic acids had extinction coefficients of 284.5, 307.0, 295.8, and 117.0, resp., at 316, 330, 346, and 374 mμ. (*C. A.* 49, 8618)

Weight changes of linoleic and linolenic acids and their derivatives in the course of autoxidation. Y. Toyama and Y. Hirabayashi. *Mem. Fac. Eng. Nagoya Univ.* 6, 53-8(1954). Linoleic acid and its Me and Et esters, linoleyl alcohol and its acetate, 10,13-nonadecadien-2-one, b_3 175-6°, and the corresponding compounds of linolenic acid including 10,13,16-nonadecatrien-2-one, b_2 175-8°, were prepared, spread on glass plates and exposed to the atmosphere. In the series placed indoors, weight increases up to 14% for the compounds of linoleic and 25% for the linolenic series were noted. The rate of weight changes in both series were in the order: acid > acetate > alcohol > Me ester > Et ester > Me ketone. In the same series placed outdoors and exposed to sunlight the samples reached a maximum weight increase and then began to decrease after 2 to 3 days. After 35 days Me linoleate had lost 50% of its original weight. (*C. A.* 49, 8099)

Water content of fatty oils with special reference to castor oil. Y. Toyama and F. Ono. *Mem. Fac. Eng. Nagoya Univ.* 6, 63-5 (1954). The water content of several fatty oils was determined by the Fischer method and by the absorption method. The Fischer method gave slightly higher results. Castor oil dissolves more water than other fatty oils. An approximate solubility curve of water in castor oil shows 0.6% water at —7.0° to 0.92% at 26.5°. (*C. A.* 49, 8615)

Corrosion of metallic material for the apparatus in high-pressure reduction of fatty acids and higher alcohols. Ryoichi Toyoda. *J. Japan. Oil Chemists' Soc.* 4, 66-70(1955). Acid-corrosion was highest for 13 Cr steel and very low for 18/8 Ni-Cr steel. Increase in Ni and addition of 2-3% Mo to the latter increased the anticorrosion property. Pure Cu (99.97%) was stable to acid-corrosion and alcohol-corrosion. Soft steel and Cr-Mo steel was unstable to acid-corrosion, but stable to higher alcohol. Aluminum (99.0-99.9%) had slight stability for corrosion by acid and higher alcohol. Hydrogen under pressure had little effect on corrosion properties of metals. Higher temperature (300°) and lower fatty acid (caprylic) promoted corrosion.

Japanese researches in the field of fats and oils published in 1954. Saburo Komori(Osaka Univ.). *J. Japan. Oil Chemists' Soc.* 4, 70-8(1955). A literature review with 163 references.

Technical reaction conditions of the catalytic reduction of fatty acids. Ryoichi Toyoda. *J. Japan. Oil Chemists' Soc.* 4, 63-5 (1955). The minimum temperature employable industrially was 260-290° for stearic, myristic, and mixed lower fatty acids (in increasing order) at 180-200 kg./cm.^{2} for 90 min. In the reduction of a mixture of equal amounts of capric acid and decyl alcohol, esterification prevailed at 170-220° and the reduction of the ester occurred at 230-270°. Addition of 10% higher alcohol promoted the reduction of fatty acid.

Synthesis of higher fatty alcohols by the catalytic reduction of fatty acids. I. Reduction of caprylic, capric, and lauric acids. Sumio Matsuda and Ryoichi Toyoda(Osaka Univ.). *J. Japan. Oil Chemists' Soc.* 4, 10-14(1955). Practically pure acids prepared from coconut oil fatty acids by repeated distillation were reduced in an autoclave in the presence of a mixed catalyst Cu-Cr oxide. The products of reduction under varying conditions were analyzed for unreacted free fatty acid, alcohol, ester, and water. Experiments on caprylic, capric, and lauric acids showed the following mechanism of reduction: i.e., in the course of reduction (1) fatty acid was first reduced to alcohol, (2) the alcohol was esterified with a considerable amount of remaining fatty acid, (3) as the concentration of ester increased, the reduction of ester occurred with more and more rapidity, and (4) free alcohol was thus formed mainly by reduction of the ester. The range of conditions was 80-120 kg./sq. cm. initial pressure, 280-340°, and 0-180 min.

Preparation of dibasic acids from fatty oils. IV. Oxidation of stearic and lauric acids by nitric acid under pressure. Masaru Kobayashi(Osaka Munic. Techn. Research Inst., Osaka). *J. Japan. Oil Chemists' Soc.* 4, 53-6(1955). Stearic or lauric acid was heated in a sealed tube under various conditions. Under some suitable conditions either acid was converted to water-soluble acids. The products under selected conditions (6 g. stearic acid heated with 60 cc. 30% HNO_3 at 160° for 24 hrs., or 6 g. lauric acid heated with 60 cc. 30% HNO_3 at 170° for 13 hrs.) were separated by distillation and paper chromatography of hydroxamic acids. Both acids produced acetic, propionic, butyric, and valeric acids as monobasic ones, and succinic, glutaric, adipic, and pimelic acids in good yields as dibasic acids. It was shown that the intermediate product consisted of nitrocarboxylic and pelargonic acids.

Rust inhibitors. II. Rust-preventive properties of maleate oil for nonferrous metals. Seimi Sato(Technol. Sta. Aichi Pref., Nagoya). *J. Japan. Oil Chemists' Soc.* 4, 14-19(1955). Maleic anhydride adduct of butyl oleate was examined as a rust inhibitor for aluminum, zinc, bronze, and gun metal. The method of examination was compared between the static water-drop corrosion (used previously) and the dipping of the oiled pieces in distilled water. For all the metals tested, the maleic anhydride adduct was superior to oleic acid.

Separation and structure determination of eicosatetraenoic acid from swine liver lipide. Tsutomu Shimooka and Yoshiyuki Toyama(Nagoya Univ.). *J. Japan. Oil Chemists' Soc.* 4, 27-9 (1955). The crude eicosatetraenoic acid prepared from swine liver lipide contained less than 15% pentaenoic and a little conjugated acids when measured by ultraviolet absorption spectrometry of the acid itself and its alkali-isomerized product. The oxidation with $KMnO_4$ in acetone showed the presence of succinic and butyric acids, which proved the structure to be 4,8,12,16-tetraenoic acid.

The occurrence of highly unsaturated. triethenoid, and diethenoid alcohols in the liver oil of Laemonema morosum. A preliminary report. Seiichi Ueno, Toru Hidaka, and Takumi Okamoto(Kinki Univ., Fuse City, Osaka). *J. Japan. Oil Chemists' Soc.* 4, 26-7(1955). This oil [acid no. 5.6, saponification no. 136.5, I no. (Wijs) 120.6 n_D^{20} 1.4716, unsaponifiable matter 18.1%] contained mixed fatty acids with neutralization no. 172.5, I no. 80.4, unsaponifiable matter with acetyl no. 129.0, and I no. 97.8. By fractional distillation, measurement of acetyl and iodine nos., and bromination the unsaponifiable matter was found to contain unsaturated alcohols with 2, 3, and more double bonds.

Shortening. I. The creaming property of shortening. Kimitoshi Nakazawa, Tetsuo Shimada, and Mitsugu Umezawa(Nihon Yushi Co., Ohji, Tokyo). *J. Japan. Oil Chemists' Soc.* 4, 57-60 (1955). The creaming value was determined by the method of Bailey and McKinney [*Oil and Soap* 18, 120-2(1941)]. Commercial shortenings (11 samples in Japanese market) had creaming value 200-350%, much higher than butter and margarine. The aging was effective in increasing this value by 30% at 30°, but it had no effect at lower temp. In general vegetable oils (rape, cottonseed, and soybean oils) were superior to animal oils (whale oil and butterfat) as the raw material. The addition of monoglyceride emulsifier was beneficial in increasing the degree and stability of air in shortening.

A report on sampling of oils. I. Anon. *J. Japan. Oil Chemists' Soc.* 4, 100-11(1955). Stochastic considerations.

Five years after margarine tax repeal two states still ban yellow. W. L. Tracy. *Soybean Digest* 15(9), 14, 16(1955). The effects of repeal of Federal margarine taxes and the provisions of present restrictive laws in Wisconsin and Minnesota are briefly reviewed.

Recent developments in the fish by-products industry. J. A. Lovern(Torry Research Station, Aberdeen). *J. Sci. Food Agr.* 6, 234-9(1955). Developments in Great Britain and the United States in the production of fish by-products other than fish meal are reviewed. Particular emphasis is placed on drying methods and the production of protein feeding stuffs and oil.

Method of making a partial ester composition of improved stability. N. H. Kuhrt(Eastman Kodak Co.). *U. S. 2,714,113.* Fatty material and an excess of polyhydric alcohol are reacted at temperatures above 100°C. in the presence of an alkali metal salt of ethylenediaminetetraacetic acid. Partial esters isolated from the reaction product are substantially free of salts of ethylenediaminetetraacetic acid and have improved stability against rancidity.

Continuous process and apparatus for refining glyceride oils. C. R. Scott(Phillips Petroleum Co.). *U. S. 2,714,114.* Apparatus is described for the countercurrent contacting of an oil with an alkaline solution. Soap deposits on the walls of the chamber and is removed by scrapers.

Recovery of fatty acids. K. T. Achaya, S. A. Saletore, and S. H. Zaheer. *Indian 51,816*, 1955. Oil foots, such as cottonseed foots, are saponified by heating with excess alkali to yield a mixture of monomeric fatty acids and a polymerized mass. The mixture of crude fatty acids is separated by distillation and refluxed for an hour with urea or thiourea in EtOH solution to obtain a solid urea or thiourea-fatty acid complex. After cooling, the product is filtered and the solid complex is washed with EtOH. The solid complex is then boiled with H_2O to recover the fatty acids which separate out and float on the surface of the H_2O. (*C. A.* 49, 8620)

The methods of examination of fats and fat products. Committee reports. Tomotaro Tsuchiya *et al. J. Japan. Oil Chemists' Soc.* 4, 96-100(1955). The methods described include: melting point, titer, solubilities (in ethyl alcohol and glacial acetic acid), heating test (Gardner method), setting test (of China tung and similar oils), and drying test (of drying, semi-drying, and fish oils). *Ibid.* 175-9. Methods for moisture (by the Karl Fischer method), solidification point (the Dalican method) cloud point, and coloration during heating (of drying oils except China tung and similar oils) are described.

A continuous separation of a mixture of fatty acids or their derivatives. A. Urakami and H. Sakurai(Fuji Oil Mfg. Co.). *Japan 3687('54).* Cottonseed oil fatty acids in a solvent (e.g. C_6H_6 or $MeCOCHMe_2$) and an aqueous solution of urea are mixed continuously at a definite ratio and separated into urea adduct and an unreacted portion. The solvent and urea are removed from the unreacted portion to yield 75.7% fatty acid with iodine no. 142.5 and neutralization no. 203.3. The urea adduct is decomposed with water to yield 24.3% fatty acid with iodine no. 33.9 and neutralization no. 210.5. The solvent and urea solution are recycled. The apparatus is described. (*C. A.* 49, 8620)

Stability of Wijs solution. J. Esiseo Alvarez and A. Chaplick. *Anales direc. nacl. quím.*(Buenos Aires) 7(13), 22-3(1954). A 0.2 *N* Wijs solution was divided and the samples kept under various conditions. Tests made with sunflower and olive oil showed that keeping in sealed containers until used, leaving open 98 days, and storage up to 390 days made no appreciable change in the strength of the solution. (*C. A.* 49, 8030)

• Biology and Nutrition

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

Lipids phosphorus and cholesterol changes in the hen's egg during incubation. F. I. Tsuji, M. Brin and H. H. Williams(Dept. Biochem. Nutrition, Cornell Univ., Ithaca, N. Y.). *Arch. Biochem. Biophys.* 56, 290-296(1955). Lecithin phosphorus, cephalin phosphorus, total lipide choline, and free cholesterol gradually decrease in the residual yolk with incubation, whereas these substances show a gradual increase in the embryo. There is also a progressive increase in the esterified cholesterol in both yolk and egg. The hen's egg contains practically no sphingomyelin, but some appears to be formed by the embryo during development. Phospholipids and cholesterol metabolism reach their peak between the 18th and 21st days of incubation. The percentage of tissue concentration of lipide phosphorus and free cholesterol remains relatively constant in the residual yolk, but decreases in the embryo during incubation.

The distribution and physical appearance of fats in living cells —introductory survey. Flora M. Scott(Dept. of Botany, Univ. of Calif., L. A.). *Am. Jour. Botany* 42, No. 5, 475-480(1955). The distribution of fats in the cytoplasm of living vegetable cells has been surveyed in numerous spermatophytes, in a fern, a moss, a liverwort, and in two filamentous green algae. Minute fat droplets, 0.05-0.1 in. in diameter, suspended in protoplasmic fibrillae surround all chloroplasts, leucoplast and elaiplasts observed. Fats also accumulate densely in the parietal cytoplasm and occur in the plasmodesmota, occasionally in the mitochondria, and in the developing vacuome of meristematic cells. Fat droplets are visible under ordinary and phase microscope and darken immediately and progressively on irrigation of the cell with Sudan black. A predominance of fatty acids in the larger droplets is indicated on treatment with Nile blue sulfate. The results obtained with other colorants and stains and with osmic acid were inconclusive. The minute size of the fat droplets is a limiting factor in the accurate determination of color as distinct from the effects of light refraction. Intensive critical work on the nature of the droplets observed remains to be done by methods still to be devised. It appears probable that fats are synthesized within plastids and are thereafter extruded into the general cytoplasm. Cuboidal bodies, as distinct from fat droplets, merit consideration in the future discussion of chloroplast physiology.

Losses associated with groundnuts infested with Trogoderma granarium Everts. L. A. W. Hayward(W. African Stored Products Res. Unit, Kano, Nigeria). *J. Sci. Food Agr.* 6, 337-40 (1955). Larvae of the insect, *Trogoderma granarium* Everts, were added to samples of groundnut. Samples were stored for fourteen months and analyzed periodically for loss of dry matter, frass formation, and free fatty acids in the oil. Measurement of frass weight was found to be a rapid means of estimating insect damage. Free fatty acid formation was accelerated by insect infestation.

Comments on the determination of vitamin A in natural products and especially cod-liver oils. R. A. Morton and F. Bro-Rasmussen (Dept. Biochemistry, Univ. of Liverpool, England). *Analyst* **80**, 410-418 (1955). In view of the lack of official recognition of vitamin A_2 it is not perhaps desirable to express the results of spectrophotometric assays in terms of total vitamin-A activity without indicating how much is due to vitamin A_2. Liver oils from salt-water fish in general have at least 90 per cent of the total activity supplied by vitamin A_1. The analytical procedures of the British and United States Pharmacopoeias are discussed in relation to the historical setting and the newer problems arising out of the presence of three vitamin-A-active substances (all-*trans* and neovitamin A_1 and vitamin A_2) in fish-liver oils.

A modified method for the spectrophotometric determination of vitamin A in margarine. J. W. Lord and Miss P. M. Bradley (Research Dept., J. Bibby and Sons Ltd., Liverpool, 3, England). *The Analyst* **80**, 429-438 (1955). In principle, the modified method is similar to the Official method, but does not require specially activated absorbents. Commercially available de-fatted bone meal of appropriate particle size is the selected absorbent. Experiments on margarine show that it is possible to recover from the column a fraction giving spectral absorption substantially the same as that of pure vitamin A. After a correction for slight irrelevant absorption, recovery of vitamin A is near 100 per cent, compared with about 107 per cent by the official method. Result on commercial margarines by the official and modified methods are in good agreement.

Aerobic $C^{14}O_2$ formation from carboxyl-labeled stearic and palmitic acids in the presence of ascorbic acid. R. P. Geyer, Linda Marshall, Marion Ryan, Sally Westhaver (Dept. Nutrition, Harvard School of Public Health, Boston, Mass.). *Arch. Biochem. Biophys.* **56**(2), 549-551 (1955). It was found that (1) only long-chain fatty acids were attacked to any great extent, (2) $C^{14}O_2$ was derived without coenzyme A or TCA cycle activity, and (3) the fact that the ascorbic acid content of germinating seeds often reaches concentrations in excess of 60 mg./100 gm. of tissue within a few days after the start of germination. The possibility is pointed out that ascorbic acid (free or bound) or one of its derivatives participate in fatty acid metabolism by plants.

Some minor constituents of liver oils. J. C. Cain and R. A. Morton (Dept. of Biochemistry, Univ. of Liverpool, England). *Biochem. J.* **60**, 274-283 (1955). Liver fat and unsaponifiable fractions therefrom have been subjected to extensive chromatography with spectrophotometric control. Irrespective of the source (Argentine shark, fine-whale, sheep, ox, horse) formation of a variety of vitamin A artifacts handicaps the search for new minor constituents. Approximately seven constituents have been isolated and reported in this article.

Vitamin A content of hog subcutaneous fat. Amalia Amici (Univ. Perugia, Italy). *Riv. Biol.* (Perugia) **46**, 519-32 (1954). Experimental biological evidence (rat growth and health) is reported indicating that vitamin A is absent in Italian hog fat. (*C. A.* **49**, 8416)

Lecithin dehydrogenase from cattle liver. I. E. Felszeghy and Eperjessy (Univ. Cluj, Rumania). *Acad. Rep. Populare Romine, Studii Cercetări Chim.* **2**, 103-10 (1954). The extraction from cattle liver and purification of xanthine oxidase is described. (*C. A.* **49**, 8335)

The specificity of tributyrin as a substrate for esterases and for lipases. J. Meyer, J. Malgras, and R. Schär (Univ. Strasbourg, France). *Bull. assoc. diplômés microbiol. fac. pharm. Nancy* No. **52**, 10-15 (1953). Lipase produced by *Mycobacterium phlei* and a liver esterase (Biostér) were tested on 3 substrates. Biostér had the greatest hydrolytic activity against tributyrin, less against Et butyrate and least against olive oil. The lipase of *M. phlei* was most active against olive oil. Tributyrin may be used for assaying either enzyme. (*C. A.* **49**, 8390)

The function of skin and dermal hydrolases. I. Lipase. K. Yamanaka (Kyoto Prefect. Med. Coll.). *Folia Endocrinol. Japan.* **30**, 281-304, 334-53 (1954). A lipase-producing factor contained in normal rabbit skin is increased by moderate irradiation with a Hg-lamp. No effect is noted in thyroidectomized animals. A lipase-reducing factor is produced only by excess radiation and acts directly *in vivo*. (*C. A.* **49**, 8419)

Structure of sesamolin and configuration of sesamin. H. Erdtman and Z. Pelchowicz (Dept. of Org. Chem., Royal Inst. Tech., Stockholm). *Chem. & Ind.*, **1955** (20), 567-8. A characteristic color reaction widely used for sesame oil is the so-called Baudouin reaction (red color with hydrochloric acid and furfural). Sesamol, $C_7H_6O_3$, which is formed from sesamolin, $C_{20}H_{18}O_7$, m.p. 94°C., a constituent of sesame oil, by acid hydrolysis, is responsible for the color reaction. The hydrolysis of sesamolin also leads to the formation of samin, $C_{13}H_{14}O_5$, m.p. 103°C. Another constituent of sesame oil is sesamin, $C_{20}H_{18}O_6$, the structure of which is closely related to that of sesamolin. Chemical evidence indicates that sesamin possesses an axis of symmetry, and that it has the same configuration as pinoresinol. From this it follows that asarinin and *epi*pinoresinol are unsymmetrical.

The mechanism of fat absorption. A. C. Frazer (Univ. Birmingham, England). *Congr. intern. biochim., Résumés communs., 2ᵉ Congr., Paris* **1952**, 155-6. A review. (*C. A.* **49**, 8448)

Influence of blood lipide levels on inflammatory response in lung and muscle. W. R. Waddell. R. C. Sniffen, and L. Whytehead (Massachusetts Gen. Hosp., Boston). *Am. J. Pathol.* **30**, 757-69 (1954). *Klebsiella pneumoniae* and *Pasteurella pseudotuberculosis* in the presence of high blood lipide levels produced a pneumonitis in rabbits characterized by deposition of large quantities of cholesterol and fat in the inflammatory areas. (*C. A.* **49**, 8453)

Preparation of phosphatides from Indian pulses. S. Ghatak and C. R. Krishna Murti (Central Drug Research Inst., Lucknow). *J. Sci. Ind. Research* (India) **14C**, 58-9 (1955). Powdered pulses were extracted with Me_2CO in a Soxhlet apparatus and the dry residue was extracted with 95% EtOH at 55-60°. The alcoholic extract was concentrated to a semisolid and shaken with an equal volume of petroleum ether. The petroleum ether solution was concentrated *in vacuo*, the residue mixed with 4 volumes of cold Me_2CO and filtered. The precipitate was dissolved in ether, concentrated, reprecipitated with Me_2CO, filtered, dried, and analyzed. The pulses yielded 1.3-2.2% phosphatides. (*C. A.* **49**, 8514-5)

Stability of vitamin A in aqueous dispersions and in oils. S. M. Patel, U. S. Kumita, and M. V. Radhakrishna Rao (Haffkine Inst., Bombay). *J. Sci. Ind. Research* (India) **14C**, 17-21 (1955). The relative stability of vitamin A in aqueous and oily media and the protective action of a few antioxidants was studied at 28°, 45°, and 85°. The results indicate that (a) the destruction of vitamin A in aqueous dispersions is more pronounced than in lipide solvent dispersions; (b) tocopherol and lecithin stabilized vitamin A in oil but not in aqueous solution; (c) ascorbic acid gave best protection in aqueous solutions; (d) vitamin A palmitate is more stable than vitamin A alcohol in oil media but less so in aqueous solutions; (e) the stability at pH 3 was lower than at pH 8; (f) tocopherol at pH 3 had no antioxygenic property.

The influence of in vitro phosphatide upon the disappearance of free cholesterol in heparinized and unheparinized serum upon incubation. A. L. Wagner (Northwestern Univ., Evanston, Ill.). *Circulation Research* **3**, 165-70 (1955). Soybean phosphatides usually increased the disappearance of free cholesterol from human serum *in vitro*. (*C. A.* **49**, 8443)

The origin of fecal fat. II. Studies on rats with blocked bile ducts. A. Holasek (Univ. Graz, Austria). *Hoppe Seyler's Z. physiol. Chem.* **298**, 219-23 (1954). The bile ducts of rats were ligated at 2 places and severed between the ligatures. On fat-free diets, these rats excreted about twice as much fat (1 meq. fatty acid/day) as unoperated rats on the same diet. By increasing the cellulose content of the diet and by administering antibiotics, this increased fat content could be reduced to about one-third. The higher fat content of the acholic stools is probably due to an increase in the bacterial growth.

III. Studies on man. *Ibid.* 224-9. The fecal fat of men on a normal diet should be reduced to about 20% of normal by the oral administration of antibiotics. The fecal fat that is not derived from the diet probably originates with the bacteria. (*C. A.* **49**, 8421-2)

Sources and pathways of milk-fat synthesis in ruminants. V. N. Nikitin and V. A. Kaplan. *Uspekhi Sovrennoĭ Biol.* **38**, 319-39 (1954). A review on the role of dietary fat on milk-fat production, pathways of conversion of carbohydrates to milk fat in the rumen and digestive tract, the utilization of fermentation products of carbohydrates of food in milk-fat synthesis (indirect utilization of carbohydrates), interrelation between milk-fat composition and content and food, and the role of proteins in milk-fat production. (*C. A.* **49**, 8446)

Recent studies of fat digestion and absorption. R. Reiser (Texas Agr. Expt. Sta., College Station). *Clin. Chem.* **1**, 93-104 (1955). A review.

The phosphatide of aquatic animals. I. The egg lecithin of a shark (Squalus sucklii). Hisanao Igarashi, Koichi Zama, and

Muneo Katado(Hokkaido Univ., Sapporo). *J. Agr. Chem. Soc. Japan* **29**, 454-7(1955). Purified lecithins were obtained, from which glycerophosphoric acid and choline were identified as hydrolyzates. The fatty acids of the lecithins consisted of 34% palmitic, 9% stearic, 18% oleic, 9% linolenic, 13% $C_{20}H_{32}O_2$, 13% $C_{22}H_{34}O_2$, and a little myristic acids.

The change of milk fat caused by Penicillium roqueforti. I. The liberation and decomposition of volatile fatty acids of milk fat. Tsuneaki Imamura, Yoshie Saito, and Tomokichi Tsugo (Univ. Tokyo). *J. Agr. Chem. Soc. Japan* **29**, 261-4(1955). The accumulation of volatile fatty acids in the Roquefort cheese is related to hydrolysis and decomposition of milk fat by *P. roqurforti*. The molds could hydrolyze milk fat in Czapeck's solution and consume fatty acids liberated from milk fat. Lower fatty acids were more markedly decomposed by the molds than the higher ones and caprylic and capric acids were scarcely decomposed. When sugars were not present in the media, volatile fatty acids were more strongly decomposed by the molds. Butyric acid tended to be accumulated in the media.

The determination of vitamin A and carotenes in butter. Rinjiro Sasaki, Tomokichi Tsugo, and Susumu Koyama(Univ. Tokyo). *J. Agr. Chem. Soc. Japan* **29**, 234-6(1955). The butter samples collected from 11 Japanese factories in the 4 seasons were analyzed for vitamin A (colorimetry by the Carr-Price reaction), total carotene, and α- and β-carotene (spectrophotometry after chromatography on alumina). The range and average values of vitamin A (I. U./100 g.), total carotenoid (γ %), α-carotene (γ %), and β-carotene (γ %), were, respectively, for the 4 seasons: spring, 1680-2136 (1918), 136-384 (272), 31-114 (76), and 72-193 (134); summer, 1765-2541 (2060), 366-534 (444), 79-114 (94), and 214-312 (261); autumn, 1800-2800 (2107), 436-581 (490), 67-103 (84), and 266-369 (308); and winter, 1250-1990 (1499), 148-296 (192), 20-62 (31), and 78-145 (103). Thus the average total vitamin A value containing carotenoids was 2288 I. U.

Chromatographic separation of vitamin A-active compounds in cod-liver oil. F. Bro-Rasmussen, W. Hjarde and Olga Porotnikoff(Statens Vitamin-Laboratorium, Copenhagen, Denmark). *The Analyst* **80**, 418-428(1955). A method is given for the separate determination of neovitamin A, all-*trans*-vitamin A and vitamin A_2 in fish-liver oils. A separation adequate for ascertaining the relative proportions of the three compounds can be obtained by chromatography on dicalcium phosphate columns 300 to 600 mm. long. Examples are given of two such determinations in cod-liver oil; good agreement (only shown in one case) has been found between the determined content of the three compounds and the light absorption for the total vitamin-A fraction obtained by a normal chromatographic isolation of vitamin A. Absorption curves are given for the three substances.

The determination of tocopherols by paper chromatography. J. Green, S. Marcinkiewicz and P. R. Watt(Walton Oaks Exptl. Sta., Vitamins Ltd., Tadworth, Surrey). *J. Sci. Food Agr.* **6**, 274-82(1955). Filter paper was impregnated with $ZnCO_3$ by dipping into a filtered solution of $(NH_4)_2CO_3$, $ZnCO_3$, and NH_3, and drying at 95° to 100°. Single dimensional chromatograms of unsaponifiable fractions of oils were prepared on this paper and developed with cyclohexane. Tocopherol spots were located by spraying the dried chromatogram with a ferric chloride—α,α'-dipyridyl reagent. Separation of tocopherols from moderate amounts of interfering substances was good. Large quantities of sterols and other interfering substances were removed by treating the unsaponifiables with floridin earth before chromatography. *R* values for tocopherols were: *alpha-*, 0.66; *beta-*, 0.43; *gamma-*, 0.43; and *delta-*, 0.20. One dimensional chromatography on $ZnCO_3$-paper was adequate for all oils not containing *epsilon-* or *zeta-*tocopherols. A more complete separation of tocopherols was achieved by two-dimensional chromatography in which the first stage was on $ZnCO_3$-impregnated paper and the second was on paraffin coated paper with 75% ethyl alcohol as the developing solvent. Recovery of pure tocopherols was over 98%. Quantitative analyses are reported for oils from wheat germ, wheat bran, soybean, cottonseed, arachis, rape, corn, mustard, barley, rye, oats, and chick mash. In general, the oils may be divided into two classes on the basis of tocopherol contents: one containing *alpha, beta, epsilon,* and *zeta* types; the other containing *alpha, gamma,* and *delta* types. Oats are anomalous in containing at least five tocopherols. The presence of 5-methyltocol in wheat products was confirmed. In addition, *delta-*tocopherol having properties similar to those of synthetic 5:7-dimethyltocol was isolated from coarse wheat feed and barley.

The chemical estimation of vitamin E activity in cereal products. II. Millers' offals and compound animal feeds. P. W. R. Eggitt and L. D. Ward(Dept. Applied Biochem., Univ. Birmingham and Spillers Ltd., Central Lab., Cambridge). *J. Sci. Food Agr.* **6**, 329-37(1955). The authors' previously described method [*J. Sci. Food Agr.* **4**, 176(1953)] for tocopherol assay by chromatography on paper impregnated with liquid paraffin was modified slightly and applied to the analysis of coarse bran, fine wheatfeed (middlings), commercial and purified wheat germ meals, chick mash and breeders' mash. The Emmerie-Engel reaction was found to be less sensitive to temperature changes when the $\alpha\alpha'$-dipyridyl was added before the ferric chloride. The assessment of vitamin E activity from the tocopherol pattern is discussed. The presence of a fast-spot substance (*epsilon-*tocopherol) in wheat bran was confirmed and its absence from pure wheat germ was demonstrated. *Epsilon-*tocopherol may be 5-methyltocol and may have significant vitamin E activity.

• Drying Oils

Raymond Paschke, Abstractor

A review of condensation polymerization. M. S. Rhodes(Allied Chemical & Dye Corp.). *Paint Ind. Mag.* **70**(6), 10-2(1955). A mathematical treatment.

The role of radicals in oxidative drying. H. Hulleman(Verfinst. T. N. O., Rijswijk Z. H., Neth.). *Verfkroniek* **27**, 200-6(1954). A review is given of the oxidation of hydrocarbons and the autoxidative polymerization of drying oils, comprising the formation of radicals, reaction of hydrocarbons with O, influence of the structure of the hydrocarbon on the velocity of oxidation (e.g., 2- or 3-methylheptane, 3,4- or 2,5-dimethylhexane, 3-ethyl-3-methylpentane, 2,2,4-trimethylpentane, 2,3,3-trimethylbutane with Co stearate as catalyst), and the action of the salts of heavy metals as oxidation catalysts. 14 references. (*C. A.* **49**, 8611)

Copolymerization of alkyd silicones for coatings. C. R. Hiles, B. Golding, and R. N. Shrene(Purdue Univ.). *Ind. Eng. Chem.* **47**, 1418(1955). Reacting the alkyd portion of the resin to a low acid number before addition of the silicone gave products superior to those formed when all the reactants were added at the start of the reaction. Gloss and color retention varied in proportion to the silicone content of the varnish, and craze life varied inversely with the silicone content. Gloss, color retention, and craze life improve with decreasing oil length, and the optimum is in the range 30 to 40. Lower oil lengths present cooking and solubility problems. The alkyd silicone enamels had good alkali resistance, toluene resistance, and were in general hard and rather brittle.

Polymerization and drying of oils and esters of fatty acids. XIII. Isomeric transformation in polymerization of oils. A. Ya. Drinberg and N. S. Chervinskaya(Lensovet Technol. Inst., Leningrad). *Zhur. Priklad. Khim.* **27**, 1307-12(1954). Tung oil, linseed oil, cottonseed oil, and the pentaerythritol esters of the fatty acids of these oils were isomerized with a catalyst and thermopolymerized to give preparations with low viscosity, 180-200 seconds at 20° and preparations with high viscosity, 900-1070 seconds (Ostwald viscosimeter). The differences between the Br and the I numbers together with the diene number and the spectrum analyses indicate that the primary factor in polymerization is heat and not catalysis. (*C. A.* **49**, 9290)

A history of paints and varnishes in Great Britain. Part 6. A period of expansion. F. Armitage(Lewis Berger Ltd., Great Britain). *Paint Manuf.* **25**, 226(1955). Important advances in theoretical and synthetic organic chemistry by Hofmann, Kekule, Wohler, Erlenmeyer, Baeyer, Fischer and others, increased technical education and the appearance of a number of new scientific journals between 1850 and 1914 are considered by the author in the last part of the series. He points out that these developments occurred together with improvements in the standard of living throughout the country.

Fatty acids for the alkyd industry. Anon. *Paint Oil Chem. Rev.* **118**(13), 18(1955); *Ibid.* **118**(14), 19(1955). A comprehensive staff report covering (1) sources, specifications, and composition of fatty acids, (2) analytical methods, (3) the determination of fatty acid composition, (4) typical alkyd formulations, and (5) the handling of fatty acids.

Drying oils. Knoll A.-G. Chemische Fabriken(H. Albers and K. T. Gunzert, inventors). *Ger. 848,815.* The known process of preparing drying oils by treating saturated or unsaturated aliphatic aldehydes having at least 2 C atoms with excess saturated or unsaturated cyclic ketones or their homologs in the presence of acid or alkali condensation agents at low temperature (30-70°) is improved by adjusting the reaction mixture to pH 5-7 and heating it at 100-300°, possibly under sub- or superpressure, to remove volatile constituents and to produce the desired degree of polymerization. The obtained pale-brown oily condensation products of the "drying-oil" type are compatible with paraffin hydrocarbons, such as white spirit, spindle oil, and similar mineral oils, can be blended with linseed oil, stand oil, or cellulose esters, and yield compact, elastic films on drying in the open air. (*C. A.* 49, 9292)

• Detergents

Lenore Petschaft Africk, Abstractor

Detergency evaluation. E. H. Armbruster and G. M. Ridenour (Univ. of Michigan, Ann Arbor, Mich.). *Soap Chem. Specialties* 31(7), 47-50(1955). Two types of easily and inexpensively prepared materials are described which are suitable for use as soil tracer indices. One, a radioactive chromium phosphate sol, is highly stable, and insoluble in alkalies, acids, and organic solvents. The other, a bacterial suspension tagged with radioactive phosphorus is likewise adaptable to use as a soil tracer. The stability of each with respect to bonding of radioactive phosphorus to the soil, and the freedom of each from free phosphorus is demonstrated by electrophoresis measurements.

A multicycle alternate soil-wash test for evaluation of fabric detergents. R. Bernstein and H. Sosson (Naval Shipyard, Philadelphia, Pa.). *Proc. Chem. Specialties Mfrs. Assoc.* 1954 (Dec.), 166-70. The development of a reproducible procedure is presented with typical results for a variety of detergents in soft, hard, and sea water. Unsoiled white cotton swatches are carried through a number of alternate cycles of soil deposition from an aqueous detergent bath followed by soil removal in a fresh detergent bath in a Terg-O-Tometer wash. Experiments are described to show the general utility of this procedure. Curves are given showing the change of reflectance with cycle. Soap with carboxymethylcellulose is superior to soap alone and to soap with Na_2SiO_3; this agrees with the known behavior of these combinations. (*C. A.* 49, 8620)

Perfuming detergents and cleansers. V. DiGiacomo and L. Stoller (Givaudan-Delawanna, Inc., N. Y.). *Soap Chem. Specialties* 31(7), 41-2(1955). The problems involved in perfuming new synthetic cleansing products to produce odors pleasing to the consumer and effective in masking their inherent unpleasant odors are discussed.

A clinical application of a hydrophilic ointment base. J. Q. Gant (George Washington Univ. of Medicine, Washington, D. C.). *Arch. Derm.* 71, 688-91(1955). Little is known about the mechanism of skin irritation by wetting agents. The etiologic significance attached to alterations of pH and the removal of the acid mantle of the skin cannot explain all of the findings. A study of hydration of the stratum corneum indicates that both soaps and synthetic ionic detergents act by forming complexes with the keratin of the stratum corneum, thereby increasing its power of water imbibition, and resulting in considerable swelling. The wetting agents have a similar and even greater effect on the less closely crosslinked, more soluble prekeratin of the cells of the lower portions of the epidermis than on the relatively inert, fully cross linked keratin of the stratum corneum. The penetrating power of detergents suggests the occurrence of an alteration of the interfacial tensions between skin and water. A new hydrophilic ointment base is suggested as a means of counteracting and neutralizing the emulsifying power of the detergent.

Sanitizer-detergents. L. Gershenfeld (Philadelphia College of Pharmacy and Science, Philadelphia, Pa.). *Soap Chem. Specialties* 31(5), 164-7, 213; (6) 163, 164, 167(1955). Sanitizer-detergent iodophors based on nonionic detergents are preparations which under conditions of use possess a quick biocidal action on many microorganisms, do not stain permanently, are non-toxic, non-irritating, do not sensitize, nor do susceptible microorganisms become resistant to these compounds. They are stable, noncorrosive, are miscible with water in all proportions, and are effective in cold and warm water solutions and in soft and hard waters. They are compatible with most electrolytes and all other surfactants.

Washing with the aid of ultrasonics. H. Hollstein. *Textil -u. Fasser-stofftech.,* 4, 729-31(1954). The physical principles of sound waves and supersonics are discussed and their action and effect on textiles are described. The use of ultrasonics in laundries and experimental results are reported. By using ultrasonics produced by magnetostriction oscillators or piezoelectric resonators, the lower frequencies appear to be most suitable for washing purposes.

Detergent solubility. J. V. Karabinos (Blockson Chem. Co., Joliet, Ill.). *Soap and Chem. Specialties* 31(6), 50-1(1955). The titration of various nonionic polyoxyethylene ethers and esters with aqueous phenol was studied to determine the relationships of hydrophobic and hydrophilic chain lengths. With pure hydrophobic groups the results can be correlated much better than with mixed hydrophobes. The method shows some promise in control analysis of ethenoxy chain length where the hydrophobic group is known. However, it does not seem to be useful for the determination of ethenoxy chain length of unknown detergents.

Rapid method for the plotting of soap diagrams. M. Loury (ITERG, Paris). *Rec. franc. corps gras* 2, 225-36(1955). Tables, each containing 37 analyses of phase compositions of 4 hard soaps at various contents of fatty acids and NaCl, are reproduced and instructions given for tracing of the respective phase diagrams according to McBain. 7 figures. (*C. A.* 49, 9297)

Foam and detergency improvers. R. L. Mayhew, C. F. Jelinek and A. Stefcik (General Aniline and Film Corp., Easton, Pa.). *Soap Chem. Specialies* 31(7), 37-40, 167, 169(1955). A new class of alkylene oxide based nonionics has been discussed which show considerable promise as foam and detergency improvers for such anionic surfactants as alkylaryl sulfonates. The products are of value for both unbuilt light duty detergents and built heavy duty detergents. They also improve the detergency of both built and unbuilt dishwashing detergents. These nonionic materials exhibit solubilizing effects for alkylaryl sulfonates, making them adaptable for liquid formulations.

Improved method for the decoloration of oils and soaps with sodium chlorite activated by stannous chloride. C. Paquot and Mm. M. Paquot. *Rev. franc. corps gras* 2, 217-21(1955). $SnCl_2$ acts better than H_3PO_4 of persulfates as activator in bleaching operations with $NaClO_2$ since the oxidation-reduction system between stannous and stannic compounds favors release of O by the decomposition of $NaClO_2$. In laboratory tests of soaps at 80°, made by adding aqueous solutions of $SnCl_2$ and immediately afterwards $NaClO_2$, the bleaching effect is very significant in 10-15 minutes with 0.6-1% $SnCl_2$ and 0.3-0.4% $NaClO_2$ and the stability of the soaps is improved. Plant operations with 8-10 tons of tallow, acid oils, and peanut-oil soapstocks in presence of 20% H_2O gave bleaching effects as in the laboratory tests, and it was accompanied by a distinct deodorization. Small Fe plates were introduced into the reaction vessels to test corrosiveness of the reagents. A protective film of Sn formed and the loss was only 4 mg. per 25 sq. cm. surface after the first 2 or 3 operations. Weight loss of plates in the first operations was 106 mg. per 25 sq. cm. (*C. A.* 49, 9295)

Disposal of synthetic detergents. N. Pilpel. *Research* (London) 8, 62-9(1955). Methods are outlined for overcoming difficulties in primary sedimentation and from foam formation due to detergents at sewage-treatment plants. Only when exceptionally high concentrations of synthetic detergents are present will efficiency of biological degradation be reduced. (*C. A.* 49, 8619)

Transparent soaps. F. V. Wells (London, England). *Soap and Chem. Specialties* 31(6), 39-41; (7), 43-6, 114(1955). The history and theory of transparent soaps are reviewed. These transparent soaps are said to be of a crystalline nature. Factors involved in production of these soaps include choice of the most suitable fat stocks, a combination of tallow, rosin and castor oil is usually used; selection of non-soap additives which promote transparency such as alcohol, glycerine or sugar, determination of the optimum rate and temperature of cooling, and consideration of phase changes due to mechanical treatment. 21 references.

The quality of domestic (Japanese) soaps at present. Seiichi Ueno, Toru Hidaka, and Isamu Sakakibara (Kinki Univ., Fuse City, Osaka). *J. Japan. Oil Chemists' Soc.* 4, 30-2(1955). Analyses are given for moisture, combined and free fatty acids, combined and free alkali, neutral fat plus unsaponifiable matter, alcohol-insoluble matter, color, and neutralization no., iodine no., and melting point of combined fatty acids for commercial toilet and laundry soaps manufactured in 1946 and 1952. Specific surface tension of 0.25 and 0.5% solutions at 20°, 40°, and 60° were also tabulated for 1952 soaps.

Aromatic biguanide compounds in detergent compositions. W. O. Tundermann (Colgate-Palmolive Co.). *U. S. 2,706,179.* A detergent composition normally tending in water to cause tarnishing of copper base alloy consists of synthetic detergent, water-soluble inorganic polyphosphate salt and a minor amount of a biguanide compound selected from the group consisting of aryl biguanides and their salts sufficient to inhibit tarnishing.