endogenous fatty acids similar in composition to those of nonruminant animals.

In order to test this corollary a Jersey steer was placed on the following milk replacer on the sixth day after birth: 55 lbs. of nonfat dried milk, 45 lbs. of dried whey, 0.5 lb. of Aurofac 10, and 100 g. of Silmo-stabilized vitamin A and D concentrate (pelleted). This was fed *ad lib.*, mixed with water, until the calf was three months old and dry thereafter. The daily consumption was: from 6 to 90 days, one pound; 91 to 120 days, 1½ pounds; and 121 days to date of slaughter, two pounds. No other concentrate or forage was fed. Cellulose was offered, but consumption averaged only about one-half pound per day. The addition of molasses to the cellulose resulted in a temporary increase in consumption for a few days. More than two pounds of the milk replacer could not be fed without scours developing.

The animal refused food on the 173rd day and was sacrificed two days later. Although it was quite thin, several hundred grams of adipose tissue were collected from around the kidney. The fat was obtained by extraction of the tissue in a Waring Blendor with chloroform and freed of phospholipide by treatment with silicic acid. Polyunsaturated fatty acids were determined spectrophotometrically (6) and more detailed fatty acid analysis by gas chromatography[1] (Table I). Infrared analysis[1] of the sample indicated only a trace of *trans* isomers.

THIS FAT is a typical beef tallow. It could therefore be concluded that the peculiar fatty acid composition of beef tallow is not caused by rumen hydrogenation of dietary C_{18} unsaturated acids. There remains not only the question of the origin of the high stearic acid content of the ruminant fat but also an explanation for the disappearance of the unsaturated fats from the rumen stomach and intestine, previously observed (5). One possible explanation for the latter is that rumen micro-organisms preferentially utilize the unsaturated acids since, in earlier work (5) it was the disappearance of the polyunsaturated acids which was measured and not an increase in saturated C_{18} acids. Another explanation is that the rumen micro-organisms produce a high level of stearic acid and thus dilute the polyunsaturated acid content of the media.

TABLE I

The Fatty Acid Composition and Chemical Characteristics of the Perirenal *Fat of a Jersey Steer Reared for Five Months and Twenty-Two* Days on an Essentially Fat-Free Diet

Fatty acid	Gas chromatography	Ultraviolet spectrophotometry
	%	%
Myristic	2.2	......
Palmitic	27.3	......
Palmitoleic	3.7	......
C_{17} saturated	2.1	......
Stearic	29.2	......
Oleic	35.0	......
Dienoic	......	0.51
Trienoic	......	0.31
Tetraenoic	......	0.00
Chemical characteristics		
Iodine value	34	......
Saponification number	199	......
Saponification equivalent	283	......
Mean molecular weight of the fatty acids	270	......

Results of the present study also reopen the possibility that typical ruminant fat arises from biohydrogenation of dioleyl palmitin, as originally described by Hilditch (6). There are however other possibilities. Stearic acid may be synthesized by rumen bacteria from nonfatty precursors or from the short-chain fatty acids produced in the rumen from carbohydrate. It has been shown that rumen micro-organisms do not synthesize polyunsaturated acids (7, 8). It is also possible that the stearate is produced in the ruminant liver from the large amounts of the short-chain acids absorbed from the rumen. And there is, of course, the possibility that the high stearic-acid level of ruminant fat is a normal, endogenous product of ruminant anabolism.

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REFERENCES

1. Reiser, Raymond, Fed. Proc., *10*, 23b (1951).
2. Willey, N. B., Riggs, J. K., Colby, R. W., Butler, O. D. Jr., and Reiser, Raymond, J. Animal Sci., *11*, 705 (1952).
3. Shorland, F. B., Weenink, R. O., Johns, A. T., and McDonald, I. R. C., Biochem. J., *67*, 328 (1957).
4. Garton, G. H., Hobson, P. N., and Lough, A. K., Nature, *182*, 1511 (1958).
5. Reiser, Raymond, and Reddy, H. G. R., J. Am. Oil Chemists' Soc., *33*, 155 (1956).
6. Hilditch, T. P., and Stansby, W. J., Biochem. J., *29*, 90 (1935).
7. Cunningham, H. M., and Loosli, J. K., J. Animal Sci., *13*, 265 (1954).
8. Garton, G. A., and Oxford, A. E., J. Sci. Fd. Agri. *6*, 142 (1955).

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[1] By L. A. Van Akkeren and R. J. Vander Wal of Armour and Company, Chicago, Ill.

ABSTRACTS . . . . R. A. REINERS, Editor

ABSTRACTORS: Lenore Petschaft Africk, R. R. Allen, S. S. Chang, Sini'tiro Kawamura, F. A. Kummerow, and Dorothy M. Rathmann

• Fats and Oils

ISOLATION OF BETA-SITOSTEROL FROM CASSIA ABSUS, LINN. A. W. Johnson (Mellon Inst., Pittsburgh 13, Pa.). *J. Org. Chem.* 23, 1814–5 (1958). Beta-sitosterol was identified as a component of an oil obtained from *Cassia absus*, Linn.

PROCESSING OF FOOD FATS—A REVIEW. J. H. Sanders (The Procter and Gamble Co., Ivorydale, O.). *Food Tech.* 13, 41–5 (1959). The food fat processor can purify to a high degree the natural crude oils. He can change the character of the side chain fatty acids by hydrogenation, and change their relative positions in the triglyceride randomly or controllably by interesterification. He can create solids *in situ*, add them or remove them, and have them assume a stiffening or nonstiffening character. With such flexibility he is providing the public with a variety of palatable and nutritious foods: and if the need arises for fats with special nutritional properties, he has the means to produce them.

RECENT PROGRESS IN THE CONTINUOUS REFINING OF FATTY OILS. B. Braae (Aktiebolaget Separator, Stockholm, Sweden). *Chem. & Ind.* 1958, 1152–60. The straight caustic process, soda ash process, short mix process, and the all hermetic process for continuous processing of fatty oils are discussed in detail.

Essential Fatty Acid Retention in Flour Bleaching and Treatment. N. Fisher, M. L. Ritchie, and J. B. M. Coppock (British Baking Inds. Research Sta., Chorleywood, Herts.). *Chem & Ind.* **1958**, 1361–2. Flour bleaching or treatment with ammonium persulphate, benzoyl peroxide, and ascorbic acid produce little essential fatty acid destruction. Only at the higher level of addition of the bleaching agent, benzoyl peroxide, is there a significant rise in the conjugated dienoic acid value.

Blending and Measurement of the Properties of Shortening. J. B. Woerfel and R. W. Bates (Special Products Dept., Armour & Co., Chicago, Ill.). *Food Tech.* **12**, 674–6(1958). Laboratory tests for the production of a uniform shortening are described. Newer techniques, such as dilatometry and rheology of fats, are helpful in the formulation of shortenings.

Chemical Essentials to the Discoloration of Fish Oil. Junsaka Nonaka. *J. Tokyo Univ. Fisheries* **43**, 127–65 (1957) (in English). The dark color of the oxidized acids in fish oils was attributed to carbonyl compounds. Paper chromatographic behavior of 2,4-dinitrophenylhydrazones of acidic carbonyl compounds were determined in hexane:glacial acetic acid:xylene (5:1:3). The products of autoxidized oleic acid were: propionaldehyde, enanthaldehyde, pelalgonaldehyde, azelaic half aldehyde, and dioxostearic acid; those of linoleic acid: acetaldehyde, propionaldehyde, enanthaldehyde, pelalgonaldehyde, caprialdehyde, crotonaldehyde, azelaic half aldehyde, and dioxostearic acid; those of sardine oil: acetaldehyde, enanthaldehyde, crotonaldehyde, azelaic and sebacic half aldehydes, and dioxostearic acid. The autoxidation of fish oils must be initiated by a second factor which may be organic or inorganic acids, bases, or neutral substances. (*C.A.* **52**, 21171)

Effect of Fat on Carotene Stability in Dehydrated Alfalfa. A. E. Denton and E. R. Bielanski (Research Labs., Swift & Co., Chicago, Ill.). *J. Agr. Food Chem.* **6**, 853–55 (1958). The influence of various fats on carotene retention in different samples of dehydrated alfalfa was investigated. Some samples of dehydrated alfalfa with added fat showed greatly improved carotene retention, while others did not. Carotene retention was not improved by antioxidants at the level normally used for the stabilization of fats; however, the use of antioxidants at higher levels may improve carotene retention. Fatty acids did not increase carotene destruction in dehydrated alfalfa, but caused color deterioration.

Chromatographic Separation of Glycerophospholipides. D. N. Rhodes and C. H. Lea. *Biochem. Problems Lipids, Proc. Intern. Conf. 2nd., Ghent,* **1955**, 73–9 (Pub. 1056). A review with illustrations. (*C.A.* **52**, 20354)

Uncertainty in Lipide Structures. J. A. Lovern. *Biochem. Problems Lipids. Proc. Intern. Conf., 2nd. Ghent,* **1955**, 95–103 (Pub. 1956). A detailed discussion concerning the criteria necessary to avoid pitfalls in the determination of structure of lipides is given (*C.A.* **52**, 20316)

Ethanol-Insoluble Phosphatides of Ox Liver. J. N. Hawthorne and J. Hawthorne. *Biochem. Problems Lipids Proc. Intern. Conf., 2nd., Ghent,* **1955**, 104–7 (Pub. 1956). The structure and purification by chromatography of the inositide in ox liver is described. (*C.A.* **52**, 20317)

The Lipid-Protein Complex of Wheat Flour. R. A. Bottomley, B. R. McAuslan, and A. D. G. Powell (M.B.T. Research Lab. Pty. Limited, Sydney, Australia). *Chem. & Ind.* **1958**, 1476–7. Seventeen amino acids, liberated on acid hydrolysis of the lipids isolated from three Australian flours, were identified and reported.

Nature of the Monoethenoic Fatty Acids of Butterfat. R. H. Backderf and J. B. Brown (Ohio State Univ., Columbus). *Arch. Biochem. Biophys.* **76**, 15–27 (1958). A method of cleavage analysis was developed which permits determination of the mole % compounds of a mixture of positionally isomeric octadecenoic acids or esters with a maximum error of ±4%. In conjunction with established optical methods, the method was applied to a study of the C_{16} and C_{18} fatty esters of butterfat. A previously unreported acid, *trans*-16-octadecenoic, was found; it is believed to occur to the extent of 1–2% of the total butterfat fatty acids. An 11-octadecenoic acid occurs to the extent of 3–4% of the total butterfat acids; it was mostly *trans* (vaccenic) acid, but inconclusive evidence is offered for the *cis* form as well. No conclusive evidence was found for the occurrence of elaidic acid in butterfat. The C_{18} acids possess appreciable unsaturation in the 8-position. Unsaturation in this position occurs mostly, if not exclusively, in multiunsaturated acids. Over 20% of the hexadecenoic acids of butterfat have the *trans* configuration. These previously unreported *trans* acids account for about 0.4% of the total fatty acids in butterfat. No positional isomers of 9-hexadecenoic acid were found. (*C.A.* **52**, 20736)

Chromatographic Separation of Conjugated Unsaturated Fatty Acids. Separation of elaeostearic Acid. S. R. Palit, A. Banerjee, B. T. R. Iyengar, and M. M. Chakabarty (Calcutta Univ.). *Indian Soap J.* **23**, 221–6 (1958). Indian tung oil was used as the source of elaeostearic acid. (*C.A.* **52**, 21168)

The Stabilization of Lard with Antioxidants. A. Zanzucchi and G. Delindati (Staz. sper. ind. conserve aliment., Parma, Italy). *Ind. conserve* (Parma) **33**, 11–15 (1958). The stability of lard treated with antioxidants and stored at temperatures higher than normal (16-63°) was examined after 120 days by determining the peroxide number and various organoleptic characters. The most effective stabilizing compounds were: nordihydroguaiaretic acid, α-tocopherol, and a mixture of praseodymium gallate, propylene glycol, and citric acid. (*C.A.* **52**, 20746)

Adulteration of Edible Vegetable Oil and Fats. F. Paolini (Lab. chim. centrale Dogane, Rome). *Olivicoltura* **13**(5), 11–12 (1958). The use of "pseudo-fats" (esters of fat acids with ethylene glycol) as adulterants of edible fats is denounced. (*C.A.* **52**, 20746)

Oxidation of Fats in Emulsions. II. The Effect of Various Emulsifiers on the Stability of Fats. P. Finholt and G. Hopp (Univ. Oslo, Norway). *Medd. Norsk Farm. Selskap.* **20**, 33–43 (1958) (English summary). Addition of 10% of Tweens, Myri, and Brij shortened the induction periods of lard (at 50°) and olive oil (at 73°). The same quantities of Spans prolonged the induction periods. The oxidation process was followed by peroxide determination. (*C.A.* **52**, 20745)

Utilization of Lard. I. Nature of Various Fat Fractions in Sow Body. T. Miyabe and Y. Kawata (Kagawa Agr. Coll., Kagawa-ken). *Kagawa Kenritu Nôka Daigaku, Gakyzyutu Hôkoku,* **7**, 98–100 (English summary, 103–4) (1955–56). Characteristics (density, melting point, acid number, saponification number, iodine number, and Polenské number) were determined in 14 portions of sow body fat. The upper layer was considerably different in these values from the lower layer of back fat. The melting point of fat was higher in kidney and mesentery and was lower in ham, bacon and the connection of ham and back. The acid number was higher in mesentery and the connection mentioned above. The iodine number was lower in kidney, mesentery, and interior of abdomen. (*C.A.* **52**, 20746)

Rancidity in Milk. B. L. Herrington (Cornell Univ., Ithaca, N.Y.). *Ann. Rept. N.Y. State Assoc. Milk Sanitarians* **30**, 87–92 (1956). A review. (*C.A.* **52**, 20724)

Development of Rancidity in Bakery Products. J. M. R. de la Borbolla y Alcalá and A. Vargas Romero (Inst. Grasa y sus Derivados, Seville). *Grasaa y aceites* (Seville, Spain) **9**, 55–9 (1958). Rancidity is inhibited in mantecas (a Spanish bakery product containing sugar, flour, and lard) by using antioxidants in the product or in the paper wrapper. The effect of the wrapper is explained by its large surface area and its exposure to light. The presence of trace metals (copper, iron, or zinc) in the wrapper accelerates rancidity. (*C.A.* **52**, 20716)

Fatty Acids in Foods. Callie Mae Coons (U. S. Dept. of Agr., Washington, D.C.). *J. Am. Dietetic Assoc.* **34**, 242–7 (1958). A review. (*C.A.* **52**, 20710)

Viscosity Increase Due to Solid–Fat Formation in Tempering Chocolate Coatings. Wm. Duck. *Mfg. Confectioner* **38** (7), 9–12 (1958). To measure the percentage of solid fat (degree of tempering) in a chocolate coating, a laboratory tempering kettle-viscometer has been developed. (*C.A.* **52**, 20759)

Use of Glyceryl Monostearate and Related Emulsifiers in Candy. W. H. Knightly. *Mfg. Confectioner* **38**(6), 33–42 (1958). A weak gradual association of the amylopectin fraction is responsible for the staling of starch products such as bread and jellies. The addition of small amounts of surfactants inhibit staling, probably through interference with this association. The oleic, palmitic, and stearic monoesters of glycerol, a lactic acid-modified glycerol monopalmitin, the monostearate esters of sorbitol, polyoxyethylenes (20) and (40), and propylene glycol, and sucrose distearate were evaluated in starch jellies and in high- and low-cook caramels. Only sucrose distearate was ineffective with the jellies. Polyoxyethylene (40) monostearate and glycerol monostearate were the most effective with jellies. All were effective with the caramels. Glycerol monostearate and the lactic acid-modified monopalmitate were most effective with high-cook caramels. The lactic acid-modified monopalmitate was most effective with low-cook caramels. (*C.A.* **52**, 20759)

CHEMICAL CHARACTERISTICS OF FISH OIL PREPARED IN VACUO. L. Bērziņš. *Trudy Inst. Ekspt. Med., Akad. Nauk Latv. S.S.R.* **14**, 165–71 (1957); *Referat. Zhur. Khim., Biol. Khim.* **1958**, Abstr. No. 20037. The fish oil retained its natural biochemical properties. The quantity of nonsaponifiable substances ranged from 1.19 to 1.61% and was independent of the season of the year and of the method of purification. The iodine number of the fatty acids was above that of the oil itself. The vitamin A content of vacuum-obtained fish varied with the season between 2.27 mg. %, beginning with mid-October, and 8.50 mg. %, beginning with February 14th. Vacuum-obtained fish oil was of a lower acidity and was not as intensely colored. (*C.A.* **52**, 21172)

POLAROGRAPHIC STUDIES ON THE RANCID OIL. T. Kikuchi, I. Okada, I. Osakabe, and K. Fukushima (Tokyo Univ. Fisheries, Kurihama). *J. Tokyo Univ. Fisheries* **42**, 39–63 (1956). The polarographic method was applied to studies on the oxidation of fish oil. Polarograms of fresh fish oils (sardine oil, whale oil, calamary oil, tunny fish oil, lard, beef tallow, and soybean oil) showed similar waves with half-wave potentials of −0.4 volt and −1.2 volts *versus* saturated calomel electrode. An additional wave having a half-wave potential of −1.9 volts *versus* saturated calomel electrode was observed in oxidized samples of the above oils, in oxidized oleic and linoleic acids, and in the distillate of oxidized fish oils. The compound reduced in about −1.9 volts *versus* saturated calomel electrode seemed to be caused by the aldehyde group produced during the oxidation of fish oil. (*C.A.* **52**, 21171)

OLIVE KERNEL OIL. P. I. Smith. *Am. Perfumer Aromat.* **72** (3), 37 (1958). The quality of this inedible olive oil, which is used for soap stock and wool combing, varies with the geographic location of production, the soil, and the growing conditions. (*C.A.* **52**, 21171)

DETECTION OF ANIMAL-OIL ADDITION TO OLIVE OIL, BY CHROMATOGRAPHY OF THEIR STEROLS. M. Vitagliano (Univ. Naples). *Pubbl. Univ. cattolica S. Cuore, Ann. fac. agrar., Ser. 5, Atti convegno appl. tec. cromatogr. prod. agr.* **53**, 60–7 (1957). Determination of R_f values of sterol was found unsatisfactory for detecting addition of animal oil to olive oil. (*C.A.* **52**, 21171)

EVALUATION OF FAT STABILITY BY A SIMPLE PAPER TEST. EXPERIMENTS ON OLIVE OIL. C. Cantarelli (Univ. Perugia, Italy). *Pubbl. univ. cattolica S. Cuore, Ann. fac. agrar., Ser. 5, Atti convegno appl. tec. cromatogr. prod. agr.* **53**, 74–9 (1957). The method of Täufel and Vogel (*C.A.* **49**, 13669b) is found satisfactory for applications to olive oil. (*C.A.* **52**, 21171)

IODINE NUMBER OF THE UNSAPONIFIABLE MATTER IN THE DIFFERENTIATION OF OLIVE OIL FROM OTHER OILS. L. Frontero (Lab. Raffineria Ital. Olio, Imperia, Italy). *Olii minerali, grassi e saponi, colori e vernici* **35**, 227–8 (1958). The iodine numbers of various oils are tabulated, and several examples are given for the purpose of differentiating the oils: e.g. tea oil has the same index of refraction values as olive oil, but the iodine numbers of the unsaponified matter are, respectively, 54 and 113.3. (*C.A.* **52**, 21171)

EXTRACTION OF OLIVE DRUPE OIL. A. Giuffrida and G. D'Arrigo. *Boll. informaz. ind. olearia e saponiera* **4**, 25–33 (1958). A lecture. (*C.A.* **52**, 21171)

OLIVE-OIL DEACIDIFICATION BY ADSORPTION CHROMATOGRAPHY. F. Minutilli (Univ. Rome) and G. Ruggieri. *Pubbl. univ. cattolica S. Cuore, Ann. fac. agrar., Ser. 5, Atti convegno appl. tec. cromatogr. prod. agr.* **53**, 150–7 (1957). The oil, dissolved in an organic solvent, was passed through an aluminum oxide column, and then eluted by the same solvent. Neutral aluminum oxide was better than acid aluminum oxide. The most suitable solvent was ethyl ether. (*C.A.* **52**, 21170)

PHYSICOCHEMICAL CHARACTERIZATION OF EXTRACTIVE BULGARIAN GRAPE OIL. M. Gerasimov, D. Tsanev, and N. Benbasat. *Khim. i Ind.* (Sofia) **29**(4), 7–11 (1957). Bulgarian grapeseed oil is of the semidrying type, has high acid number (30–3), and consists of 51.8% linoleic acid. (*C.A.* **52**, 21170)

REFINING LOW ACIDITY OILS. A. Giuffrida and G. D'Arrigo. *Boll. informaz. ind. olearia i saponiera* **4**, 3–7 (1958). The conventional sodium hydroxide treatment is made after the raw oil has been purified (e.g. with phosphoric and oxalic acids) and decolorized (e.g. with hydrogen peroxide). In such a manner, the obtained (by-product) soap gives, on treatment by sulfuric acid, an olein product which can be easily decolorized and directly esterified with glycerol, thus avoiding the olein distillation. (*C.A.* **52**, 21170)

EVALUATION OF ACTIVATED CLAYS IN BLEACHING VEGETABLE OILS. M. Krejčinović, M. Filajdić, and B. Punek (Univ. Zagreb, Yugoslavia). *Kem. i ind.* (Zagreb) **6**, 77–82 (1957). Bleaching capacities of two commercial activated clays are evaluated. (*C.A.* **52**, 21170)

THE FATTY-ACID CONTENTS OF LAUREL (LAURUS NOBILIS) FROM THE YUGOSLAV COASTAL AREA. M. Krajčinović and M. Filajdić (Univ. Zagreb, Yugoslavia). *Kem. i ind.* (Zagreb) **6**, 141–4 (1957). Pulp oil and kernel fats, respectively, of laurel berries from the Yugoslav coastal area contain lauric acid 1.0, 45.1; palmitic acid 19.0, 3.8; oleic acid 56.5, 28.0; linoleic acid 21.0, 23.1; and linolenic acid 2.5, 0 weight % (based on fatty material freed of unsaponifiable matter). (*C.A.* **52**, 21170)

DETERMINATION OF THE FATTY-ACID DISTRIBUTION IN VEGETABLE OILS BY IODINE AND THIOCYANOGEN NUMBERS. V. P. Rzhekhin and N. I. Pogonkina. *Masloboino-Zhirovaya Prom.* **24**(8), 10–12 (1958). Methods for determination of hypothetically pure triglyceride content of the fat or the fatty acid distribution in mixture of fatty acid are discussed and their applicability for the estimation of hypothetically pure triglyceride and fatty acid in vegetable oils containing appreciable amounts of linoleic and linolenic acids are evaluated. (*C.A.* **52**, 21170)

CHARACTERISTICS OF THE RAPESEED OIL IN OKAYAMA PREFECTURE. Yuichi Shinozaki and Sachiko Ohara. *Okayama Daigaku Nôgakubu Gakujutsu Hôkoku* **11**, 15–24 (1958). Of 27 varieties of *Brassica napus*, iseguro showed the lowest iodine value, and kinki No. 28 the highest oil content. Thirty days after the petal falling, no glucose was detected, and oil content, acid value, and iodine value became constant in seeds. Phosphatide in seeds was in proportion to alcohol-soluble matter. (*C.A.* **52**, 21170)

CHEMICAL DETERMINATION OF N-METHYLAMIDE OF O,O-DIMETHYL DITHIOPHOSPHORYLACETIC ACID RESIDUES IN OLIVE OIL. B. Bazzi (Ist. ric. agrar. Soc. Montecatini. Signa, Italy) and R. Santi. *Olivicoltura* **13**(4), 3–5 (1958). Further improvements on Bazzi's method (*C.A.* **50**, 15985d) are presented. (*C.A.* **52**, 21169)

DE-ACIDIFICATION OF VEGETABLE OILS BY ESTERIFICATION WITH GLYCEROL. J. Ruiz Cruz and M. A. Albi Romero (Inst. Grasa y sus Derivados, Seville). *Grasas y aceites* (Seville, Spain) **9**, 64–73 (1958). A review with 64 references. (*C.A.* **52**, 21169)

CHROMATOGRAPHIC CHANGES OF THE HAUCHECORNE REACTION FOR SEED OILS AND [SO-CALLED] "RETTIFICATO B" IN MIXTURES WITH OLIVE OIL. F. Duro (Univ. Catania, Sicily) and P. Condorelli. *Boll. sedute accad. Gioenia sci. nat. Catania* **4**, 34–7 (1947). The mixtures with cotton, rapeseed, field cabbage, or soybean-seed oil gave, after 3–4 minutes of warming in the conditions of the hydrogen reaction, a sharp reddish color which faded or disappeared with progressing heating and became sharply orange-yellow after 20 minutes. The mixtures with "rettificato B" gave a moderate orange-yellow color from the beginning of the reaction, without variations. (*C.A.* **52**, 21169)

THE CONSTANTS OF THE TOTAL FATTY ACIDS OF ANIMAL OR VEGETABLE ORIGIN; THEIR UTILIZATION FOR DETECTING ESTERIFIED OILS. Luigi Matarese (Lab. Dogane, Bologna, Italy). *Olii minerali, grassi e saponi, colori e vernici* **35**, 39–46 (1958). (*C.A.* **52**, 21169)

RECENT STUDIES ON THE OXIDATION OF OILS. P. de Radzitzky (S. A. Purfina, Brussels, Belg.) *Ind. chim. belge* **23**, 233–50 (1958). A review with 29 references. (*C.A.* **52**, 21169)

THE ROLE OF TIME, VACUUM, AND LIVE STEAM IN THE DISTILLATION OF MISCELLA. V. V. Beloborodov and M. A. Chudnovskaya. *Masloboino-Zhirovaya Prom.* **24**(8), 13–7 (1958). The study deals with the effects of the distillation cycle, live-steam consumed as determined by G_B/G_P ratio (the quantities of steam used and solvent removed per unit time, respectively), and the vacuum levels on the concentration of miscella; and of G_B/G_P alone or together with distillation cycle on the flash point of oil at the end of distillation process. The optimum conditions for the removal of solvent can be readily determined by the inflection zones of the respective curves. (*C.A.* **52**, 21169)

MECHANISM OF TRANSFER OF SURFACE FILMS. M. Black and V. K. La Mer (Columbia Univ.). *Proc. Intern. Congr. Surface Activity, 2nd, London, 1957*, **1**, 102–8. A simple apparatus for transfer of surface films is presented and discussed. (*C.A.* **52**, 21167)

MOLECULAR INTERACTION IN MIXED MONOLAYERS. F. C. Goodrich (California Research Corp., Richmond). *Proc. Intern. Congr. Surface Activity, 2nd, London, 1957*, **1**, 85–91. The intermolecular forces resulting from interaction of various species in interfaces are related to the excess thermodynamic properties of the system. Thermodynamic developments of the excess free energies, entropies, and enthalpies of mixing are given. (*C.A.* **52**, 21167)

Molecular Aggregations in Mixtures of Fatty Materials. D. G. Dervichian (Inst. Pasteur, Paris). *Olii minerali, grassi e saponi, colori e vernici* **35**, 229–34 (1958). By examining the melting curves of mixtures of fatty acids, followed by examining these mixtures with x-rays, molecular aggregations were found to exist between the fatty material, phosphatides, and cholesterol; these aggregations are in simple molecular ratio and were observed particularly when mixing acids of molecular chains: $C_{12} + C_{14}$, $C_{12} + C_{16}$, $C_{12} + C_{18}$. (*C.A.* **52**, 21167)

Separation and Identification of Fatty Acids. XIX. Paper-Chromatographic Analysis of the Component Fatty Acids of Natural Fats. Manjiro Noda, Osamu Hirayama, and Yoshiyuki Inoue (Kyoto Univ.). *Nippon Nôgei-Kagaku kaishi* **30**, 106–11 (1956). Analysis of natural fats could be made by combining previously reported methods. It is best to use the method of mercuric acetate addition (modified to ascending paper chromatography) for higher unsaturated fatty acids, the method of 2,4-dinitrophenylhydrazide formation and reversed-phase chromatography of hydroxamic acids for higher saturated fatty acids, and the ordinary hydroxamic acid method for volatile fatty acids. (*C.A.* **52**, 21166)

Characterization of the Red Pigment Formed in the 2-Thiobarbituric Acid Determination of Oxidative Rancidity. R. S. Sinnhuber, T. C. Yu, and T. C. Yu (Dept. of Food and Dairy Tech., Oregon Sta. Coll., Corvallis, Oregon). *Food Research* **23**, 626–33 (1958). The pure crystalline 2-thiobarbituric acid pigment was prepared as purple black needles from rancid salmon oil, sulfadiazine and malonaldehyde formed by the acid hydrolysis of 1,1,3,3-tetraethoxypropane. The pigments were found to be identical. The crystalline pigment is a condensation product of one molecule of malonaldehyde with two molecules of 2-thiobarbituric acid and the probable elimination of two molecules of water. Most of the 2-thiobarbituric acid reactive material is present in rancid salmon oil as complex compounds, possibly acetals, which are not volatile in stream of nitrogen. However, upon the addition of hydrochloric acid the 2-thiobarbituric acid reactive material, probably malonaldehyde, may be removed by a stream of nitrogen.

Absolute Configuration of Ricinoleic Acid. K. Serck-Hanssen (Dept. of Med. Biochem., Univ. of Gothenburg, Sweden). *Chem. & Ind.* **1958**, 1554. Ricinoleic acid has been identified as (+)-12D-hydroxyoctadeca-*cis*-9-enoic acid.

The Composition of the Fatty Acids Liberated from the Phospholipides in the Preparation of Salted Codfish. A. Cardin, M. A. Bordeleau, and A. Lafromboise (Fisheries Research Board, Can., Grande-Rivière). *J. Fisheries Research Board Can.* **15**, 555–8 (1958). During the preparation of light salted ''Gaspe cure'' codfish, 77% of the phospholipide fatty acids were set free. Those liberated were mainly C_{20} and C_{22} highly unsaturated acids. The C_{16} saturated and unsaturated acids were also preferentially liberated. (*C.A.* **52**, 20747)

The Canneri-Marconi Reaction. G. Petruccioli (Ist. sper. Olivicoltura, Spoleto, Italy). *Olii minerali, grassi e saponi, colori e vernici* **35**, 47–8 (1958). The Canneri-Marconi reaction to detect esterified oils, prepared with zinc catalyst, in olive oil is suitable even with oils kept in sheet zinc containers two years. (*C.A.* **52**, 21171)

Complex Salts of Higher Fatty Acids. S. Fişel (Inst. Chim. ''P. Poni,'' Iaşi). *Acad. rep. populare Romîne, Filiala Iaşi, Studii Cercetări ştiint.* **7**(2), 13–17 (1956). The salts prepared are complexes of copper distearate or dipalmitate with 1 mole/amine. The copper soaps are dissolved in the amine with heat, and the complex salt is precipitated by addition of ethyl alcohol. The amines which furnish complexes are 2-, 3-, and 4-picoline, quinoline, isoquinoline, aniline, *m*- and *p*-toluidine, *p*-anisidine, and *m*- and *p*-chloroaniline. With the same technique it is impossible to prepare complex salts from *o*-toluidine, *o*-anisidine, *o*-chloroaniline, 1,3,4- and 1,4,5-xylidine, dimethylaniline, 1- and 2-naphthylamine, and *o*-, *m*-, and *p*-phenylenediamine. (*C.A.* **52**, 21165)

Recent Technology of Fats and Fat Products. XLIII. The Disintegration of Raw Materials. H. P. Kaufmann and J. G. Thieme (Deut. Inst. Fettforschung, Münster/Westf., Ger.). *Fette, Seifen, Anstrichmittel* **59**, 983–90 (1957). A review with 38 references.

XLIV. The Disintegration of Raw Materials. *Ibid.* 1096–1104. A review of the equipment used for the pulverizing of raw materials. (*C.A.* **52**, 21165)

The Problem of Water in the Manufactureing Process of Fats. Tei Hidaka. *Abura Kagaku* **5**, 362–6 (1956). A review on the state of fatty oil and water in the maturation, drying, and germination of vegetable seeds, the relation of oil and water in oil pressing, the treatment of crude oil by steaming, separation of wax from rice-bran oil by steaming, the relation of water and wax or solid fat in the fatty oil, water in alkali refining, and water in acid clay. (*C.A.* **52**, 21165)

A Symposium on Oxidation and Its Prevention. Introduction. Tsutomu Kuwada. *Abura Kagaku* **7**, 247 (1958).

Reaction Mechanism of Autoxidation and Bond Energies. Makoto Takashi (Univ. Tokyo) *Ibid.* 248–56.

Oxidation Stability of Fuel Oils. Yuzo Koga (Toa Fuel Ind. Co., Shizuoka). *Ibid.* 257–63.

Some Problems in Oxidation Stability Tests of Lubricating Oils. Akira Wakana (Shôwa Oil Co., Tokyo). *Ibid.* 263–75.

Oxidation of Edible Fats and Its Evaluation. Shinji Mitsunaga and Umajiro Shimamura (Nihon Oil & Fat Co., Tokyo). *Ibid.* 275–84.

Oxidation and Flavor Problems in Edible Oils. Kazuhiko Yoshitomi (Nisshin Oil Mills, Ltd., Yokohama). *Ibid.* 285–93.

Edible Oils. Mitsuo Nakamura and Sakan Tomita (Sugiyama Sangyô Kagaku Kenkyûsho, Mitaka, Tokyo). *Ibid.* 293–8.

Stability of Fatty Acids. Izumi Yamane (Lion Fat & Oil Co., Tokyo). *Ibid.* 298–302.

Oxidation of Shortening and Margarine. Hisato Murata (Asahi Electro-Chem. Co., Tokyo). *Ibid.* 302–8.

Vitamins and Antioxidants. Goichiro Katsui (Eisai Co., Tokyo). *Ibid.* 308–12.

Rancidity of Soap. Masao Nonaka. *Ibid.* 312–14.

Perfumery. Shigeo Katsura (Takasago Perfumery Co., Tokyo). *Ibid.* 315–17.

Rusting of Fish Products and Its Prevention. Junsaku Nonaka (Tokyo Univ. Fisheries, Shiba, Tokyo). *Ibid.* 317–22.

The Oxidation of Foods and Its Prevention. Yoshijiro Kihara (Ochanomizu Univ., Tokyo). *Ibid.* 322–5. (*C.A.* **52**, 21165)

The Oxidation of Fats and Oils. B. Lathlean. *Paint J. Australia—New Zealand* **3**(1), 12–13, 15–8 (1958). The mechanism of hydroperoxide formation and decomposition and subsequent polymerization is reviewed. Paper chromatography was used to study the scission products of thermal decomposition of autoöxidized methyl linoleate and of the high-temperature (150–200°) oxidation of methyl linoleate. Seven carbonyl compounds (aldehydes) were found. (*C.A.* **52**, 21156)

Catalytic Activity of the Dispersed Metals in the Oxidizing Polymerization of Oil. M. A. Lunina (D. I. Mendeleev Chem. Technol. Inst. Moscow). *Nauch. Doklady Vyssheĭ Shkoly, Knim. i Knim. Tekhnol.* **1958**(2), 275–8. Kinetics of oxidation of linseed oil by oxygen at 89.5° in the presence of catalysts (lead and cobalt stearates, and dispersed metals) have been studied. Cobalt and lead soaps increase the speed of polymerization, which attains a maximum, the height and position of which is determined by the concentration and the nature of the introduced soap. Lead and bismuth soaps also increase the polymerization. In the presence of bismuth sols, the speed of the process with respect to time also passes through a maximum, depending on the concentration of the sol. Organic sols of metals as catalysts are less effective than the soaps, but they also accelerate polymerization. The concentration of the sol can be adjusted so as to produce the same catalytic action as the heavy metal soaps. For example, the catalytic action of 0.8% lead sol is equivalent to the action of 0.32–15% of the lead soap. (*C.A.* **52**, 21155)

Paper Chromatography of Antioxidants. R. ter Heide. *Fette, Seifen, Anstrichmittel* **60**, 360–2 (1958). Paper chromatography of antioxidants in fats permits identification of 0.005% *tert*-butylhydroxyanisole (BHA) and 0.01% *tert*-butylhydroxytoluene (BHT) in lard and separation of mixtures of 2- and 3-BHA of less than 1% of one isomer in the other. Octyl, decyl, and dodecyl gallate are separated by extending the time of development to eight hours. R_f values are: 2-BHA 0.46, 3-BHA 0.56, BHT 1.00, gallates to C_{10} 0.00, dodecylgallate 0.02. (*C.A.* **52**, 21165)

The Dithizone Reaction and the Chromatographic Examination of Olive-Oil Ash. N. D. Sparapano (Staz. agrar. sper., Bari, Italy) and A. Strusi. *Olivicoltura* **13**(3), 3–10 (1958). In laboratory experiments (oil samples added with metallic oxides), the dithizone reaction (Canneri and Marconi, *C.A.* **48**, 4862g) was positive for the zinc, lead, and copper additions and negative for the aluminum, stannous ions, and ferric ions additions. By a chromatographic technique genuine olive oils showed the presence of aluminum, iron, and copper. (*C.A.* **52**, 21171)

Spectrophotometric Research on Sea-Fish Oils. G. D'Arrigo (Centro sper. ind. olii, Catania, Italy). *Olii minerali, grassi e saponi, colori e vernici* 35, 111–13 (1958). Marine oils show an absorption band in the ultraviolet at wave length over 280 millimicrons: by this examination it is possible to detect these oils in mixtures of at least 10% with olive, linseed, etc., oils. (*C.A.* 52, 21172)

Structure of Fatty-Acid Monolayers and a Mechanism for Collapse. H. E. Ries, Jr., and W. A. Kimball (Standard Oil Co. [Indiana], Whiting). *Proc. Intern. Congr. Surface Activity, 2nd, London 1957* 1, 75–84. Film-balance and electron-microscope techniques were used together to study the thickness, size, and shape of hexatriacontanoic acid films before and after collapse. A pressure/area isotherm is given for hexatriacontanoic acid; values observed for cross-sectional molecular area, film thickness, collapse pressure, and film compressibility were 20.4 square A., 50 A., 58 dynes/cm., and 0.0034, respectively. Electron micrographs at 15 dynes/cm. revealed islands of hexatriacontanoic acid of 1 μ in greatest dimension and 50 A. in film thickness; this thickness corresponds to a unimolecular film. At 19 dynes/cm. the film was continuous, and the bare portions were discontinuous. Electron micrographs taken after film collapse showed long, narrow, flat structures of 100 A. or 2 molecules thickness. (*C.A.* 52, 21166)

The Optical Refraction of Crystalline Glycerides. M. Sachsse and G. Sachsse. *Fette, Seifen, Anstrichmittel* 59, 1063–6 (1957). The concept of characterizing fatty acid glycerides by determining the index of refraction at 25° or if solid at 40°, is disputed. In particular, the effect of polymorphic sample history is felt to invalidate the use of 40° measurements corrected to 25°. Examples of the possible variability are given for various treatments of a cocoa butter. (*C.A.* 52, 21169)

The Optical Refraction of Crystalline Glycerides. H. P. Kaufmann and J. G. Thieme (Deut. Inst. Fettforschung, Münster/Westf., Ger.). *Fette, Seifen, Anstrichmittel* 59, 1066–8 (1957). The validity of the conclusions of M. and G. Sachsse are disputed. (*C.A.* 52, 21169)

Carnauba Wax Analysis. C. S. Treacey and A. S. Cascione (M. Argueso & Co., Mamaroneck, N. Y.). *Soap Chem. Specialties* 34(10), 97, 103–4 (1958). Improvements in carnauba method D 1342-54T for determining hydrocarbons in carnauba wax are described. (*C.A.* 52, 21172)

Some Physical and Practical Properties of Ester Waxes with Regard to Their Molecular Structure. E. Finck (BASF Ammonia Lab., Ludwigshafen/Rh., Ger.). *Fette, Seifen, Anstrichmittel* 59, 1026–36 (1957). Ester waxes of various long-chain fatty acids, but in particular the acid mixture derived from the chromic acid-sulfuric acid treatment of montan wax, with a wide range of alcohols and diols, were examined for those properties that might influence their utility as waxes. The important properties of the waxes were found to be somewhat dependent on the microcrystalline structure. (*C.A.* 52, 21172)

1,3-Diolein and 1,3-Distearin Esters of Fumaric, Succinic, and Adipic Acids. R. O. Feuge and T. L. Ward (Southern Regional Res. Lab., U.S. Dept. of Agriculture). *J. Am. Chem. Soc.* 80, 6338–41 (1958). The 1,3-diolein and 1,3-distearin esters of fumaric, succinic, and adipic acids were prepared by reaction between the 1,3-diglycerides and the acid chlorides of the dibasic acids in the presence of pyridine or quinoline, special precautions being taken in most instances to reduce the amount of side reactions. The reaction products were purified and a number of their physical properties were determined. The melting points of the highest melting polymorph of the products derived from distearin ranges from 82.1 to 89.8°. The compounds derived from diolein either could not be obtained in a crystalline form or crystallization was incomplete; hence no melting points were determined for these compounds. From X-ray diffraction patterns it was concluded that the quick-chilled and the highest melting forms of the distearin-containing compounds crystallized in a structure equal in length to about that of two stearic acid chains. The compounds crystallized as long thin needles. All of the diglyceride esters of the dibasic acids were quite viscous when compared with cottonseed oil at the same temperature.

A Gas-Liquid Chromatographic Method for Volatile Fatty Acids in Milk. C. L. Hankinson, W. J. Harper, and E. Mikolajcik (The Ohio State Univ., Columbus). *J. Dairy Sci.* 41, 1502–09 (1958). Gas-liquid partition chromatography provided a means for a rapid and accurate analysis for the volatile fatty acids in milk. The chromatographic apparatus utilized a 6-mm. I.D. glass column 4 ft. long and packed with Celite 545 containing 25% liquid phase. The liquid phase consisted of silicone-stearic acid (95/5 w/w) mixture. The operating temperature of the column was controlled by use of a heating jacket through which glycerol could be circulated. Analysis for formic, propionic, butyric, valeric, caproic, and caprylic acids could be completed in 90 min. This was achieved using a constant nitrogen gas pressure of 100 cm. of mercury and progressively increasing the column temperature from 60–160°. Quantitative recovery of a mixture of the seven pure acids was obtained in all trials.

Effect of Variations in Curing Salts on Oxidative Changes in Radiation Sterilized Pork. D. Hougham and Betty Watts (Dept. of Food and Nutrition, Florida State Univ., Tallahassee). *Food Technol.* 12, 681–84 (1958). Various concentrations of nitrite and nitrate were used in the cure of pork to be treated with gamma rays. Nitrite recoveries, pigment changes and oxidation of tissue fats were noted after radiation and subsequent storage at room temperature. The addition of 200 p.p.m. nitrite with no nitrate appears to be optimum for formation and retention of the cured meat pigment. Radiation converts nitrate to nitrite, but the amount of nitrite produced from this source is not sufficient to constitute a hazard. Radiation also causes loss of nitrite. Radiation produces partial oxidation of the cured meat pigment which is regenerated during subsequent storage. TBA values vary with the extent of pigment oxidation. It is postulated that ferric but not ferrous hemes catalyze the oxidation of fatty compounds of meat tissue.

A Chromatographic Technique for the Estimation of Some of the Free Fatty Acids in Lipolyzed Dairy Products. A. R. Kemp and J. H. Hetrick (Dean Milk Co., Rockford, Illinois). *J. Dairy Sci.* 41, 1494–1501 (1958). A simplified Ramsey-Patterson partition chromatographic method is described for use on short-chain fatty acids (butyric through capric) normally found in dairy products. Procedures are described for preparing samples for analysis on a prepared column. The accuracy of the method is illustrated by a chromatogram of a known mixture of synthetic acids and by an analysis of saponified butteroil, in comparison with analyses of other investigators. An indication of the precision is given by five analyses of the same sample. Typical chromatograms are tabulated and explained.

A Simple Sensitive Test for Aliphatic Ketones. E. Sawicki and T. W. Stanley (Robert A Taft Sanitary Engineering Center, Cincinnati). *Anal. Chem.* 31, 122–24 (1959). A simple, sensitive color test for acetone and other aliphatic ketones containing the structure, RCH_2COCH_2R', is based on a condensation of the ketones with 2-hydroxy-1-naphthaldehyde under special conditions.

Methyl Ketones in Evaporated Milk. N. P. Wong, S. Patton, and D. A. Forss (The Pennsylvania State University, University Park). *J. Dairy Sci.* 41, 1699–1705 (1958). Acetone, pentanone-2, and heptanone-2 were identified as the principal volatile carbonyl compounds in low-temperature, reduced-pressure distillates from commercial evaporated milk. Of these, only heptanone-2 is considered to be of possible flavor significance. Quantitative studies with simplified milk systems and six commercial brands of evaporated milk indicated that the C_5 and C_7 ketones are generated by action of heat on the fat phase.

Improved Iodometric Methods for the Determination of Lipid Peroxides. F. W. Heaton and N. Uri (Fisheries & Food Research Establishment, Greyhope Road, Aberdeen). *J. Sci. Food Agr.* 9, 781–6 (1958). In a macro-procedure for the determination of lipid peroxides, continuous de-aeration is used to reduce errors generally caused by induced oxidation. A micro-spectrophotometric method is described which allows accurate analysis of samples containing 0.02 to 5 μmoles of peroxide.

Price Support on 1959-Crop Soybeans Should be Reduced. T. A. Hieronymus (Univ. Illinois College Agr., Urbana). *Soybean Digest* 19(3), 6–10, 12 (1959). Domestic and foreign markets for oils and oilseeds are reviewed.

Waxlike Esters from Carbon Monoxide, Hydrogen, and Olefins. W. Rottig (Ruhrchemie A.-G.). *U.S. 2,844,612* High-molecular esters with properties similar to those of natural waxes are prepared by catalytic addition of carbon monoxide and hydrogen to high-molecular olefins.

Continuous Deaeration Apparatus. C. J. Davis, Jr. (Armour & Co.). *U.S. 2,863,521.* An apparatus is described for the continuous deaeration of animal and vegetable fats and oils.

Methods and Reagents for Fat Determination. P. Schain. *U.S. 2,863,734.* Fat in a fluid dairy product is determined by adding a concentrated alcoholic solution of tetradecyldesoxypolyethylene glycol and dioctyl sodium phosphate, heating the mixture near the boiling point of water, and measuring the depth of the separated fat layer.

Refining Glyceride Oils with Sulphonated Phenol-Aldehyde Resin. S. S. Gutkin (Falk & Co.). *U. S. 2,863,890.* In the refining of glyceride oils, free fatty acids and other organic impurities are removed by treatment with a sulphonated phenol-aldehyde ion exchange resin under anhydrous conditions at room temperature.

Liquid Shortening and Method of Improving Baked Goods. G. Schulman (Glenn Labs.). *U. S. 2,864,703.* In the preparation of the dough there is added 2 to 10% (based on wt. of shortening) of a polyhydric alcohol ester of a water-soluble aliphatic hydroxy-monocarboxylic acid in which some of the hydroxy groups are esterified with a C_{12} to C_{22} fatty acid.

Liquid Shortenings. G. Schulman (Glenn Labs.). *U. S. 2,864,705.* A liquid shortening is prepared from a liquid edible triglyceride oil and 2 to 10% of a polyhydric alcohol ester of lactic acid in which at least one but less than all of the hydroxy groups of the lactic acid are esterified with a C_{14} to C_{18} fatty acid.

Catalytic Modification of Fats. T. J. Weiss, L. H. Wiedermann, and G. A. Jacobson (Swift & Co.). *U. S. 2,865,759.* In a process for the modification of glycerides, the fat is brought in contact with a catalyst consisting of an alkali metal dispersed on an inorganic alkali metal salt of a strong acid. After modification is complete, catalyst is deactivated with water and the resultant foots are separated from the modified glyceride.

Shortening Containing Oxygenated Thermally Modified Hard Fat. J. W. Bremer, Jr. and L. Hilfman (Swift & Co.). *U. S. 2,865,760.* A shortening is prepared from a fat and a small amount of deodorized oxygenated, thermally modified hard fat.

Extraction of Ergosterol and Ergosterol-Like Sterols from Yeast and Analogous Products. R. A. Fisher (Bioferm Corp.). *U. S. 2,865,934.* Ergosterol is isolated from liquid fungi products by rupturing the cells with alkali, extracting the lipids with an organic solvent, saponification of the esters with alkali, precipitating the sterols with water, and separating them by filtration.

Saponification of Esters. A. Hagemann (Ruhrchemie A.-G.). *Ger. 902,493.* A method is described for saponification of esters formed in the catalytic hydrogenation of carbon monoxide with an alkalized iron catalyst to produce alcohols. Concentrated aqueous sodium hydroxide or solid sodium hydroxide is used at 150–200° and 15–30 atmospheres. (*C. A.* 52, 21174)

Purifying and Decolorizing Olive-Husk Oil. T. Cubeddu (''Montecatini'' Società Generale per l'industria mineraria e chimica). *Ital. 536,559.* The oil is dissolved in methyl alcohol or ethyl alcohol, filtered, mixed with glycerol in a 1:1 ratio, refluxed for 1–2 hurs, filtered, separated from alcohol by distillation and from glycerol, and finally subjected to conventional decolorization, possibly with hydrogen peroxide. Esterification with glycerol may follow. Alcohol and glycerol can be recycled. (*C.A.* 52, 21175)

Distillation of Oleaginous Materials to Obtain Fractions Useful as Diluents and Solvents. M. Ermini and G. Visentin. *Ital. 542,166.* Vegetable tar, e.g. from the distillation of olive seeds, is stirred in an autoclave and heated, and the vapors from 70–90° to 180–200° are allowed to leave the autoclave (0.5–1 atmosphere), to cool, and to be condensed. Such a distillate is acidified with concentrated sulfuric acid, neutralized with sodium hydroxide, and then subjected to distillation to obtain light and heavy fractions, which are in turn treated with the acid and neutralized with sodium hydroxide. The residues of the two distillations are, respectively, a pitch-like material and a material which can be used as an emulsifying agent for road bitumen. (*C.A.* 52, 21175)

Deodorization of Fish Oils. Jiro Kashima (Shinsei Coating Materials Co.). *Japan 784('58).* Deodorization of fish oil is effected by blowing hydrogen chloride gas into the oil heated at 150–300°. (*C.A.* 52, 21175)

FATTY ACID DERIVATIVES

Phosphorus Derivatives of Fatty Acids. Vinyl α-Diethylphosphonates. R. Sasin, Rose Nauman and D. Swern (Eastern Regional Res. Lab. U. S. Dept. of Agriculture). *J. Am. Chem. Soc.* 80, 6336–38 (1958). Vinyl α-bromo esters have been prepared in 30–60% yield from vinyl acetate and the appropriate C_2 to C_{18} straight chain α-bromocarboxylic acid. By heating the vinyl α-bromo esters with triethyl phosphite, the corresponding vinyl α-diethylphosphonates were prepared in 35–75% yield. The vinyl α-phosphonates are colorless, odorless liquids which are insoluble in water and soluble in organic solvents. Under prolonged heating with benzoyl peroxide, they form polymers with a low degree of polymerization.

Preparation of Oxides of Higher Fatty α,β Unsaturated Acids and a Study of Their Properties. P. A. Artamonov. *Zhur Obshcheĭ Khim.* 28, 1355–60 (1958). Esterification of the corresponding acid with methyl alcohol-sulfuric acid gave methyl *trans*-2-hexadecenoate which melts at 36°, and methyl *trans*-2-docosenoate which melts at 48°. These were treated with twice the calculated amount of benzoyl peroxide in ethyl ether for 2 hours at 30–40°, then saponified with alcoholic sodium hydroxide and acidified. 2,3-Epoxy-*trans*-hexadecanoic acid, which melts at 78.5°, 2,3-epoxy-*trans*-octadecanoic acid, which melts at 83.5°, and 2,3-epoxy-*trans*-docosanoic acid, which melts at 89.5° were isolated. These were heated with water containing sulfuric acid to yield 2,3-dihydroxyhexadecanoic acid, which melts at 116.5°, 2,3-dihydroxyoctadecanoic acid, which melts at 126.5°, and 2,3-dihydroxydocosanoic acid, which melts at 130°. Hydrogenation of the epoxy derivatives over platinum in ethyl alcohol gave 3-hydroxyhexadecanoic acid, which melts at 84.5°, 3-hydroxyoctadecanoic acid, which melts at 88°, and 3-hydroxydocosanoic acid, which melts at 92.5°. Oxidation of these with chromium trioxide gave 3-oxohexadecanoic acid, which melts at 94°, 3-oxoöctadecanoic acid, which melts at 98.2°, and 3-oxodocosanoic acid, which melts at 105°. (*C.A.* 52, 19932)

Fatty Acid Amides. IV. Unsaturated Fatty Acid Amides. H. P. Kaufmann and K. J. Skiba (Deut. Inst. Fettforschung, Münster/Westf., Ger.). *Fette, Seifen, Anstrichmittel* 60, 362–4 (1958). The synthesis of elaidic, oleic, linoleic, and linolenic acid amides: treat the free acid with formamide in nitrogen at 150–160° for four hours, dissolve in acetone, and crystallize at −20°. The physical constants found in the literature were confirmed. (*C.A.* 52, 21166)

The Saturated High-Molecular Weight Aliphatic Diacids. Their Preparation by Nitric Oxidation of the Saturated Acids and Derived Compounds. R. Perron (Certre natl. recherches sci., Bellevue-Paris). *Rev. franç. corps gras* 5, 371–83 (1958). Oxidation of methyl stearate with nitric acid (density 1.52) containing 10% of sulfuric acid yielded a diacid fraction containing azelaic acid, sebacic acid, and diacids with 14 carbon atoms or more; C_{11} and C_{12} acids are absent; and monoacid fraction containing unidentified oxidized or nitrated products derived from monoacids, a certain amount of monoacids with odd carbon numbers, and pure monoacids more than 80% of which have 16 or 18 carbon atoms, the rest 6–12 carbon atoms. Tristearine, tallow, methyl behenate, sardine oil, and rapeseed oil yielded products which differed but little from those obtained with methyl stearate by the same treatment. (*C. A.* 52, 21167)

The Chemical Examination of Fatty Alcohols. H. Etienne (Soc. Tensia, Liège, Belg.). *Olii minerali, grassi e saponi, colori e vernici* 35, 185–7(1958). A new method is described for determining aldehydes in fatty alcohols prepared by catalytic hydrogenation under strong pressure. (*C.A.* 52, 21169)

Process for the Production of Fatty Acid Hydroxy Amides. J. V. Schurman (Colgate-Palmolive Co.). *U. S. 2,863,888.* In a continuous process for the preparation of fatty acid hydroxy amides of low ester-amide content, a liquid fatty acid ester of a lower alcohol is mixed with a liquid hydroxy alkyl amine. From 0.05 to 1% by wt. of alkali metal, alkali metal alkoxide or amide is added and the mixture is heated at 70 to 175°. When the reaction is completed, the mixture is rapidly cooled to temperature below 55°.

Textile Treating Composition. C. F. Chandler (E. I. du Pont de Nemours & Co.). *U. S. 2,865,855.* A yarn dressing is prepared from a mineral oil and the acetylated derivative of 2-methoxy ethyl ricinoleate.

Solubilizing of Mineral, Vegetable, Animal Oils for Cosmetic, Pharmaceutical, and Industrial Purposes. I. I. Lubowe. *U. S. 2,865,859.* A clear non-aqueous solution is prepared from a low molecular weight aliphatic alcohol and an oil by the addition of a low molecular weight aliphatic ester of a higher fatty acid.

Processes for the Production of Dibasic and Monobasic Acids. A. Maggiolo (The Welsbach Corp.). *U. S. 2,865,937.* Unsaturated fatty acids, such as oleic and linoleic, are dissolved in a solvent, and ozonized in the presence of water. The ozonides are decomposed at 100 to 150°. Dibasic and monobasic acids are separated.

Production of Fatty Alcohols. V. L. Hansley, S. Schott, and R. Wynkoop (National Distillers & Chemical Corp.). *U. S. 2,865,968.* A mixture of the esters of C_6 to C_{22} fatty acids and the corresponding free fatty acids is converted to the esters of a reducing alcohol by a process of transesterification with an excess of the alcohol. The product is treated directly with finely dispersed sodium in the presence of a minor amount of a dispersing agent. The product is hydrolyzed and the desired fatty alcohols are isolated.

Aliphatic Dicarboxylic Acids. A. Marzin. *Ger.* (East) *11,412.* Aliphatic nitrogen-free dicarboxylic acids are prepared by oxidation of aliphatic compounds with nitric acid and the resulting products were distilled with steam, neutralized with alkali, and heat-treated in the anhydrous or aqueous state at greater than 150°, especially greater than 200°. The oxidized carboxylic acids, their salts, or esters are treated before or after heat-treatment with reducing agents. (*C.A.* 52, 21174)

Biology and Nutrition

Coloring Fat-Base Foods with β-Carotene. J. C. Bauernfeind, E. G. Smith, and R. H. Bunnell (Hoffmann-La Roche Inc., Nutley, N. J.). *Food Technol.* 12, 527–35 (1958). Commercial development of pure crystalline β-carotene as a food color and source of vitamin A prompted an investigation of its use in fat-base foods. Market forms of β-carotene are described and application of data presented on the incorporation of β-carotene in margarine, winter butter, shortening, lard, edible oils, egg yolk products, processed cheese and other fat-base foods products.

Coloring Water-Base Foods with β-Carotene. R. H. Bunnell, W. Driscoll and J. C. Bauernfeind (Hoffmann-La Roche Inc., Nutley, N. J.). *Food Technol.* 12, 536–41 (1938). Crystalline β-carotene is highly acceptable for the coloring of water-base foods, as evidenced by appearance, flavor, and stability performance. Juices, beverages, dairy products, baked goods, creamed foods, desserts, soups, etc., have been successfully colored with β-carotene.

Industrial Synthesis of Carotenoids for Use as Food Colors. O. Isler (F. Hoffmann-La Roche & Co., Ltd., Basle, Switzerland), A. Ofner and G. F. Siemers. *Food Technol.* 12, 520–26 (1958). Extension of the Isler synthesis of vitamin A has resulted in a commercial process for the manufacture of β-carotene and other carotenoids. These syntheses are not dependent on materials from animal, marine or plant sources which can vary markedly from year to year. Chemically produced carotenoids are of high purity and possess uniform color. Absorption spectra and other criteria demonstrate the chemically produced compounds to be identical with the same compounds isolated from natural material. Tolerance studies indicate no health hazard to be associated with massive doses of β-carotene and other carotenoids. Chemically produced β-carotene and other carotenoids can serve the food industry as useful food colors.

Some Electrophoretic Charactistics of Two Protein Components of the Fat-Globule Membrane of Normal Cow's Milk. J. R. Brunner and C. T. Herald (Dept. of Dairy, Michigan Agricultural Experiment Station, East Lansing). *J. Dairy Sci.* 41, 1489–93 (1958). Soluble proteins of the fat-globule membrane were studied electrophoretically in various buffer systems ranging from pH 2.05 to pH 8.79 at 1°C. One small and two large migrating boundaries were observed under conditions of maximum electrophoretic resolution. The protein of the insoluble fraction was solubilized by protein-solubilizing agents such as sodium sulfide, sodium lauryl sulfate, or dodecyl benzene sodium sulfonate in alkaline solutions. Electrophoretic mobility patterns for these solubilized protein samples exhibited a single, homogenous boundary for the sodium sulfide-treated protein, whereas the detergent-treated sample(s) were heterogeneous, showing one relatively small and two major migrating boundaries. The small boundary could be eliminated from the electrophoretic pattern by heating the solubilized protein solution to 75° momentarily.

Lipid Keratopathy and Atheroma. D. G. Cogan and T. Kuwabara (Harvard Univ. Medical School, Massachusetts Eye and Ear Infirmary, Boston, Mass.). *Circ.* 18, 519–25 (1958). Lipid plaques in corneas of patients with lipid keratopathy in corneas of hypercholesteremic rabbits and in the arteries of man and the hypercholesteremic rabbit are described. An interesting and thought-provoking analogy is drawn between the plaques that can be seen and followed in the eye during life with the more occult plaques of blood vessels in atheromatosis.

Feedstuffs Antioxidants, Oral Toxicity of Alkyl Phenylenediamines and Their Activity as Vitamin E Substitutes in Rat Nutrition. H. H. Draper and B. C. Johnson (Division of Animal Nutrition, Univ. of Illinois, Urbana). *J. Agr. Food Chem.* 6, 920–22 (1958). A study was undertaken to determine the chronic toxicity and vitamin E-sparing activity for the rat of two alkyl phenylenediamines with reference to their possible use as antioxidants in animal feeds. These compounds are N,N'-bis(1-ethyl-3-methylpentyl)-p-phenylenediamine (DOPD-3) and N,N'-bis(1-methylheptyl)-p-phenylenediamine (DOPD-2). The results demonstrated that both compounds are tolerated at concentrations of at least 0.025%, and possibly 0.1%, in the diet of the pregnant rat without impairment of reproduction. By comparison, N,N'-diphenyl-p-phenylenediamine (DPPD), which was formerly employed as a feed additive, is toxic at 0.005%. DOPD-3 and DOPD-2 exhibited a somewhat lower activity than DPPD in the prevention and cure of sterility in female rats fed a vitamin E-deficient diet.

Influence of Amino Acid Deficiencies and Protein Level on the Plasma Cholesterol of the Chick. D. Johnson, Jr., G. A. Leveille, and H. Fisher (Dept. of Poultry Science, Rutgers Univ., New Brunswick, New Jersey). *J. Nutrition* 66, 367–76 (1958). Deficiencies in the amino acids, arginine, lysine, methionine and tryptophan, were studied at different levels of protein intake in relationship to growth rate and plasma cholesterol of the young chick. It was shown that at suboptimal protein intakes, a hypercholesteremia resulted which could be modified by supplementing the deficient protein with amino acids such that more protein would become available to the bird. At optimal or supernormal protein intakes arginine, when added to a casein diet deficient in this amino acid, continued to exert a cholesterol-lowering effect which could be explained on the basis of greater protein availability; lysine and tryptophan, when added to proteins deficient in these amino acids, exerted no effect on the plasma cholesterol level and methionine produced a cholesterol-lowering effect which was not related to any improvement in protein quality or growth rate.

Radioactive Fat Absorption Patterns. Their Significance in Coronary Artery Atherosclerosis. W. Likoff, D. Berkowitz, A. Woldow, A. G. Jacobs, and D. M. Sklaroff (Depts. of Medicine and Radiology, Albert Einstein Medical Center, Northern Div., and the Bailey Thoracic Clinic, Philadelphia, Pennsylvania). *Circ.* 18, 1118–24 (1958). Fat tolerance tests with radioactive triolein were performed on a group of patients with coronary atherosclerosis or hypercholesterolemia, and significant differences from normal subjects were observed. The mechanisms and implications of these abnormalities are discussed.

Comparative Effects of Cottonseed Oil, Fatty Acids, and Diethylstilbestrol Upon Choline-Deficient Weanling Albino Rats. G. J. Miller, W. W. Ellis, P. G. Rand, and R. H. King (Agricultural Research Chemistry Dept., Univ. of Wyoming, Laramie). *J. Nutrition* 66, 425–40 (1958). Replacing 5% of cottonseed oil in a choline-deficient diet with 5% of commercial fatty acids, either high or low in unsaturation, or with 2% of cottonseed oil, significantly reduced the mortality rate of female rats. The mortality of female rats receiving a choline-deficient diet containing no added lipide was approximately equivalent to that of rats receiving 5% of cottonseed oil. The commercial fatty acids or 2% cottonseed oil diets also significantly decreased liver-lipide accumulation 8 to 12 days after diet initiation in comparison with results obtained with the 5% cottonseed oil diet. A commercial linoleic acid preparation was significantly more effective than any other lipide in reducing liver-lipide accumulation 42 days after initiation of the diet.

Effect of Bound Gossypol on the Growth-Promoting Properties of Cottonseed, Soybean, and Peanut Meals. F. H. Smith, C. T. Young, and F. W. Sherwood (Dept. of Animal Industry, North Carolina Agricultural Experiment Station, Raleigh). *J. Nutrition* 66, 393–409 (1958). The objective of this study was to determine the effect of gossypol bound to oilseed meals on the growth-promoting properties of the meals. A method for binding the gossypol to the meal without impairing the apparent growth-promoting properties of the meal in the absence of gossypol has been developed. Cottonseed, soybean, and peanut meals, untreated and treated for binding, either with or without added gossypol, were compared in diets in which the respective meals supplied all the protein at the 10% level. The meals were assayed by feeding the various diets to weanling rats during a 4-week period. There were no differences in the growth of rats consuming the untreated and treated control meals. The growth from the meals supplying the bound gossypol at the rate of 0.183 to 0.237% of the diet was significantly lower than growth from the corresponding controls.

Essential Fatty Acids in Infant Nutrition. I. Linoleic Acid Requirement in Terms of Serum Di-, Tri-, and Tetraenoic Acid Levels. Hilda Wiese, Arild Hansen, and Doris Adam (Dept. of Pediatrics, Univ. of Texas School of Medicine, Galveston). *J. Nutrition* **66**, 345–60(1958). Clinical observations and chemical determinations of the serum levels for the di-, tri-, and tetraenoic acids in relation to the dietary intake of linoleic acid have been made on 21 infants under one year of age. The results appear to justify the conclusion that the dietary requirement for linoleic acid in healthy infants may be evaluated in terms of the blood serum levels for the di-, tri-, and tetraenoic acids. Minimum normal levels for the di-, tri-, and tetraenoic acids appear to be 10.5, 2.7, and 7.4 of the total fatty acids, respectively. Optimum levels for the di-, tri-, and tetraenoic acids in the serum of healthy infants may well be 23.7, 0.6, and 10.0 of the total fatty acids, respectively.

Experimental Studies on Dietary Fats, Cholesterol, and Atherosclerosis. J. Stamler (Chicago Board of Health, Chicago, Ill.). *Food Tech.* **13**, 50–6 (1959). The overwhelming success achieved in producing atherosclerosis in every important laboratory species—a success achieved primarily by dietary means involving the addition of fat and cholesterol to the diet—is a major piece of evidence which cannot be ignored. From this experience in rabbit, chick, rat, dog, monkey, etc., it would seem valid to conclude that man is in all likelihood not decisively exceptional, i.e. that diet, dietary fats, and cholesterol play an important role in the pathogenesis and etiology of atherosclerosis in man as well.

Biosynthesis of Cholesterol and Related Substances. G. Popják (Hammersmith Hosp., London). *Ann. Rev. Biochem.* **27**, 533–60 (1958). A review of recent work on biosynthesis of the sterol structure as exemplified by studies on cholesterol. (*C.A.* **52**, 20307)

Fat Metabolism. I. Kazuyoshi Naganuma (Otsuma Women's Univ., Tokyo). *Eiyôgaku Zasshi* **12**, 39–45 (1954–55). Fat in butter when fed to rats was converted to glycogen. Butter contained 1.2429% linoleic, 0.4233% linolenic, and 0.9166% arachidonic acid. The fatty acids, which were converted to sugar, were saturated acids and oleic acid. (*C.A.* **52**, 20474)

Effect of Fat Diet on the Efficiency of Work. S. Suzuki, S. Nagamine, S. Kawada, T. Kuga, K. Yamakawa, and S. Oshima (Natl. Inst. Nutrition, Tokyo). *Eiyôgaku Zasshi* **12**, 62–8 (1954–55). The effect of a diet containing 30 and 50% fat (mainly butter) was examined. The fat diet (both 30 and 50%) was more efficient that a high carbohydrate diet in lowering expired carbon dioxide. Acetone bodies in the urine were about 3 times as much in 50% fat diet as in other diets. (*C.A.* **52**, 20474)

Relation of Glycolysis to Fat Metabolism. The Transport Function of the Pyridine Coenzymes in the Interplay Between Glycolysis, Respiration, and Fat Synthesis. Vera v. Brand and Ernst Helmreich (Med. Univ. Poliklinik Munich, Ger.). *Biochem. Z.* **328**, 146–62 (1956). Fatty acid synthesis appeared to be related to glycolysis, but not to respiration, and was inhibited by nicotinamide. (*C.A.* **52**, 20316)

Fatty Substances and Diseases of the Heart. J. P. Sisley (Inst. Fatty Substances, Paris). *Rev. fermentations et inds. aliment* **13**, 107–14(1958). Nutrition, as related to diseases of the heart, is reviewed. (*C.A.* **52**, 20462)

Atherosclerosis in Rhesus Monkeys. I. Hypercholesterolemia Induced by Dietary Fat and Cholesterol. G. E. Cox, C. B. Taylor, L. G. Cox, and Marjorie A. Counts (Presbyterian-St. Luke's Hosp., Chicago). *A.M.A. Arch. Pathol.* **66**, 32–52 (1958). In the majority of rhesus monkeys fed a high-fat diet (by mixing the various lipides with ground monkey food) the serum cholesterol values reached 300–600 mg. % within 3 months. (*C. A.* **52**, 20464)

Diet and Atherosclerotic Disease. I. Recent Pathologic and Clinical Findings. J. Stamler (Michael Reese Hosp., Chicago). *J. Am. Dietetic Assoc.*, **34**, 701–7 (1958). A review. Recent findings of clinical research have amply demonstrated a close relation between level of cholesterolemia and development of atherosclerotic disease on the one hand, and between the dietary pattern and level of cholesterolemia on the other.

II. Animal Experimental Research. *Ibid.*, 814–8. A review. (*C.A.* **52**, 20466)

Effect of Sunflower-Seed Oil on Hypercholesterolemia and Adrenaline Metabolism. A. E. Pashchenko. *Materialy po Obmenu Nauch. Inform., Ukr. Nauch.-Issledovatel. Inst. Klim. Med.* **1957**(1), 32–5; *Referat. Zhur. Khim., Biol. Khim.* **1958**, Abstr. No. 17242. Addition of sunflower-seed oil to animal rations had no effect on their total blood serum cholesterol and no noteworthy changes were observed in the total adrenaline of rat adrenal gland. (*C.A.* **52**, 20479)

Fatty Acid Supplements to the Cholesterol-Fed Rabbit. W. M. Bortz, N. P. Larsen, and W. H. Civin (USARPAC Med. Lab., Honolulu, Hawaii). *A.M.A. Arch. Pathol.* **66**, 218–24 (1958). Cholesterol-fed rabbits were given stearic, oleic, and linolenic acids as supplements to the diet. The unsaturated fatty acids tended to increase the level of the serum cholesterol, while decreasing the atherosclerotic deposits on the aortas. (*C.A.* **52**, 20489)

Plant Sterols, Degree of Unsaturation, and Hypocholesterolemic Action of Certain Fats. J. M. R. Beveridge, W. F. Connell, G. A. Mayer, H. L. Haust, and Mary White (Queen's Univ., Kingston). *Can. J. Biochem. and Physiol.* **36**, 895–911 (1958). Dietary experiments in which food was supplied in the form of a homogeneous liquid formula ration of definitely known composition were performed on 171 subjects (159 men and 12 women university students). It is concluded that there is no simple relation between the hypocholesterolemic effect of an oil and degree of unsaturation; sitosterol or something closely associated with this sterol in the unsaponifiable matter accounts for a large part of the hypocholesterolemic activity of corn oil; and certain fatty acids of short chain length or some other substance in butterfat and coconut oil have a hypercholesterolemic effect. (*C.A.* **52**, 20487)

The Effect of Deficiency of Essential Fatty Acids Upon the Skin. V. Basnayake and H. M. Sinclair. *Biochem. Problems Lipids, Proc. Intern. Conf., 2nd, Ghent*, **1955**, 476–84 (Pub. 1956). Further studies on the effect of deficiency of essential fatty acids are described. (*C.A.* **52**, 20484)

The Absorption, Transport, and Deposition of Fat. Application of a New Method for the Determination of I^{131}-Lipide Activity in Dogs and Man. I. D. A. Turner (Johns Hopkins Univ., Baltimore, Md.). *Am. J. Digest. Disease* **3**, 594–640 (1958). A review.

II. Ibid. 682–708. A method was developed for determination of I^{131}-lipide activity in plasma and tissues after administration of I^{131}-treated triolein or I^{131}-treated oleic acid in dogs and man. Absorbed fat was shown to be transported entirely in the blood plasma, the red blood cells did not participate in the transportation. Differences were noted in old and young dogs fed fat. The effects of many chemicals added to the diet were studied, including, dextrose, Tween 80, choline, lecithin, oleates, heparin, etc. (*C.A.* **52**, 20483)

Lipide Metabolism. I. Effect of Different Food Fats on the Cholesterol/Lipide Phosphorus Ratio in Plasma and Tissues of Rats and the Role of Glucose Cyclo Acetoacetate on This Ratio. M. C. Nath and A. Saikia (Nagpur Univ.). *Indian J. Med. Research* **46**, 579–87 (1958). Feeding rats with fats with high iodine values resulted in lower cholesterol levels and total cholesterol/lipide phosphorus (C/P) ratios in plasma and tissues than feeding fats with low iodine values. Hydrolyzed glucose cycloacetoacetate injected into fat fed animals lowered the C/P ratio. (*C.A.* **52**, 20483)

Lipides in the Brains of Infants and Children. J. N. Cumings, H. Goodwin, E. M. Woodward, and G. Curzon (Natl. Hosp., London). *J. Neurochem.* **2**, 289–94 (1958). Cerebral lipides, including hexosamine and neuraminic acid, have been determined in human brains from a fetal age of 10 weeks to a child of 12 years. Sphingomyelin and cerebroside increase in white matter in relation to myelinization. Hexosamine and neuraminic acid increase in white matter and cortex, the peaks are reached at different periods of growth. (*C.A.* **52**, 20529)

Dietary Fat and Cholesterol Metabolism. Fecal Elimination of Bile Acids and Other Lipides. H. Gordon, B. Lewis, L. Eales, and J. F. Brock (Univ. Cape Town, S. Africa). *Lancet* **2**, 1299–1306 (1957). The ingestion of an unsaturated fat, sunflower-seed oil, lowered the serum-cholesterol level, while hydrogenated coconut fat, fed under similar conditions, produced a sustained rise in serum-cholesterol. Sunflower-seed oil mixed in human diet with hydrogenated coconut fat lowered the serum-cholesterol level. (*C.A.* **52**, 20533)

Serum-Cholesterol Levels and Blood Pressure of Alaskan Eskimo Men. E. M. Scott, Isabelle V. Griffith, D. D. Hoskins, and R. D. Whaley (Dept. of Health, Education and Welfare, Anchorage, Alaska). *Lancet* **1958-II**, 667–8. The mean serum-cholesterol levels of 842 Eskimo men did not appear to be unusual, but there were significant differences in men from different localities in Alaska. Measurements of blood pressure showed much less variation. (*C.A.* **52**, 20533)

Effect of Different Fats on Blood Coagulation. M. K. Ramanathan and C. Gopalan (Nutrition Res. Labs., Coonoor).

Indian J. Med. Research 46, 466–72 (1958). Following intake of 85 g. of butter by healthy adult male humans, mean clotting time and Stypven time of the blood were significantly lower than the fasting values; prothrombin time, circulation time, and serum-cholesterol concentration were not affected. Hydrogenated vegetable fat and coconut oil did not influence Stypven time but did reduce clotting time; butter, hydrogenated vegetable fat, and coconut oil were in descending order with regard to effect on clotting time. (*C.A.* 52, 20532)

The Enzymatic Synthesis of Sphingomyelin. M. Sribney and E. P. Kennedy (Dept. of Biochem., Univ. of Chicago, Chicago, Ill.). *J. Biol. Chem.* 233, 1315–22 (1958). The enzymatic synthesis of sphingomyelin has been found to occur by the transfer of the phosphorylcholine moiety of cytidine diphosphate choline to the free primary hydroxyl group of a ceramide. The enzyme (PC-ceramide transferase) catalyzing this reaction is highly specific both for cytidine diphosphate choline and ceramide. The sphingosine of active ceramides must have the *trans* configuration of the double bond, and the hydroxyl group on carbon 3 must have the threo relationship to the amino group on carbon 2. Ceramides of dihydrosphingosine are inactive, but derivatives of sphingosine containing a triple bond rather than a double bond at carbon 4 are active, if the hydroxyl group on carbon 3 is threo. The enzyme is widely distributed in various animal tissues and is particularly active in chicken liver.

Biochemistry of the Spingolipides. XI. Structure of Phytoglycolipide. H. E. Carter, R. H. Gigg, J. H. Law, Teishi Nakayama, and Evelyn Weber (Noyes Lab. of Chem., Univ. of Illinois, Urbana, Ill.). *J. Biol. Chem.* 233, 1309–14 (1958). Structural studies are described on phytoglycolipide, a complex phytosphingosine-containing glycolipide obtained from plant seeds. Alkaline degradation of corn or soybean phytoglycolipide gives, among other products, cerebronylphytosphingosine phosphate and an oligosaccharide which contains inositol, glucosamine, hexuronic acid, galactose, arabinose, and mannose. Acid hydrolysis of the oligosaccharide gives a high yield of a trisaccharide which contains hexuronic acid, glucosamine, and inositol. On the basis of these data a tentative structure for phytoglycolipide is proposed.

The Enzymatic Synthesis of Sphingosine. II. Further Studies on the Mechanism of the Reaction. R. O. Brady, J. V. Formica, and G. J. Koval (Nat'l Inst. of Health, U.S. Public Health Ser., Dept. of Health, Education, and Welfare, Bethesda, Md.). *J. Biol. Chem.* 233, 1072–6 (1958). The enzymatic synthesis of sphingosine seems to occur by a reaction involving the addition of palmitic aldehyde to the activated methylene carbon atom 2 of serine in the presence of pyridoxal phosphate and manganese ions. Ethanolamine is not a precursor of sphingosine and does not readily form a Schiff basemetal complex with pyridoxal and nickel ions. The enzyme preparations used in these studies catalyzed the oxidation of palmitic aldehyde in the presence of diphosphopyridine nucleotide. The conversion of dihydrosphingosine to sphingosine has been observed in an enzyme system obtained from rat brain tissue.

Studies on the Long-Term Feeding of Acetoglycerides to Rats. A. M. Ambrose, Dorothy J. Robbins and A. J. Cox, Jr. (Western Utilization Research and Development Div., Agr. Research Serv., U.S.D.A., Albany 10, Calif. and Dept. of Pathology, Stanford Univ. School of Med., San Francisco, Calif.). *Food Research* 23, 536–49 (1958). Three samples of acetostearin and two samples of aceto-olein were fed to albino rats at dietary levels of 5, 10, and 20% for periods ranging from 400 days at the 20% level to approximately two years on the lower levels. No significant differences in growth were noted between the control animals and those fed acetoglycerides except in the case of rats on dietary levels of 20% acetostearins. Acetostearins was found to produce some scarring of kidney tissue, to produce a foreign body reaction in the fatty tissue of number of the organs, and to inhibit reproduction.

Fats Make Good Foods—Where and Why Are the Margins? C. G. King (The Nutrition Foundation, Inc., New York, N. Y.). *Food Tech.* 13, 66–8 (1959). Fats of many kinds and great complexity are characteristic of all living organisms, and the human body, like others, is capable of adjusting a great variety and wide quantitative range of lipid materials into its normal functions. As with other nutrients, the margins of relative safety and optimum intakes over a long-time interval are not well established. The advantages in flavor, satiety, consistency, appearance, economy, convenience, caloric efficiency, and practical sources of vitamins and essential fatty acids can be achieved readily within wide ranges of intake from both plant and animal foods. The latter are especially important, however, as sources of good quality proteins, water-soluble vitamins, minerals and flavor.

The Visible Fats in Our Diet. K. F. Mattil (Swift & Co., Chicago). *Food Tech.* 13, 46–9 (1959). This article discusses: Trends in consumption and composition of visible fats (shortenings, margarine, butter, salad oils, etc.) in our national diet; the historical development of our present shortenings and margarine; economic and other factors that have influenced the tremendous increase in consumption of vegetable oils and vegetable oil products in this century.

Hydrogenation of Unsaturated Fatty Acids in the Animal Body. K. Bernhard, M. Rothlin, and H. Wagner (Univ. Basel, Switz.). *Helv. Chim. Acta* 41, 1155–8 (1958). The fatty acids of rats killed eight hours after feeding with C^{14}-oleic acid or 24 hours after feeding with C^{14}-linoleic acid or C^{14}-γ-linolenic acid were isolated from the liver and from the carcass. The unsaturated acids contained 91.2–98.2% of the total radioactivity of the fatty acids. The activity of the palmitic acid and of the stearic acid was low and of the same order as that of the cholesterol, indicating that it originated from C^{14}-acetate rather than from direct hydrogenation of the unsaturated acids. When C^{14}-stearic acid was fed, the following percentages of the total activity of the fatty acids were found: stearic acid 57%, palmitic acid 15.5%, and C^{14}-oleic acid 27.5%, indicating dehydrogenation of stearic acid to C^{14}-oleic acid. (*C.A.* 52, 20549)

The Sitosterols: Variability of Serum-Cholesterol Levels and Difficulty of Evaluating Decholesterolizing Agents. A. H. Levere, R. C. Bozian, G. Craft, R. S. Jackson, and C. F. Wilkinson, Jr. (New York Univ. Post-Grad. Med. School, New York, N.Y.). *Metabolism, Clin. and Exptl.* 7, 338–48 (1958). Serum-cholesterol concentrations were determined in 25 patients with coronary artery disease with and without hypercholesterolemia, over a period of 9–23 months. Contrary to common assumption, wide fluctuations were noted, these being unpredictable, cyclic, and nonperiodic. The % variations from the mean among the hypercholesterolemic patients was as great as +39 to −33%. Nine of these patients, after a control period of 9–22 months, were treated with sitosterol for 9–30 weeks; another group of 7 patients without the long control period were similarly treated. There were no decreases in serum cholesterol concentrations that could confidently be attributed to medication. (*C.A.* 52, 20603)

Serum Cholesterol and Lipide Phosphorus in Coronary Heart Disease. K. K. Gupta, P. V. K. Iyer, H. P. Nath, Narinder Nath, S. Nagappa, and S. P. Varma (Ministry of Defence, New Delhi, India). *Metabolism, Clin. and Exptl.* 7, 349–54 (1958). Total, free, and ester cholesterol, lipide phosphorus, and total cholesterol: lipide phosphorus ratio were determined in 40 Indian subjects with coronary disease and in 100 normal Indian subjects. In normal subject lipide phosphorus rose by 0.022 mg. % for every unit increase of total cholesterol, and by 0.017 mg. % in the coronary disease patients. In normal subjects total cholesterol concentrations increased significantly as body weight increased; in the coronary disease patients, the concentration was significantly greater in those subjects whose weights were over 2.40 lb./in. than in those whose weights were under 2.40 lb./in. (*C.A.* 52, 20604)

Fatty-Acid Composition of Food Diets. M. G. Hardinge and H. Crooks (Coll. of Med. Evangelists, Loma Linda, Calif.). *J. Am. Dietetic Assoc.* 34, 1065–71 (1958). Tables are presented which include the total amounts of saturated, unsaturated, and essential fatty acids of all food fats for which reasonably reliable data could be found. (*C.A.* 52, 20710)

Effect of Acetostearin on Reproduction in Albino Rats. A. M. Ambrose, Dorothy J. Robbins, and F. DeEds (Western Regional Research and Development Div., Agr. Research Serv., U.S.D.A., Albany 10, Calif.). *Food Research* 23, 550–3 (1958). When 10% acetostearin is added to an adequate basal ration having a vitamin E content normally adequate for satisfactory reproductive performance, significant decreases occurred in the number of litters cast by albino rats and the survival of the young. Addition of vitamin E to the acetostearin diet improved performance and further improvement resulted when both vitamin E and corn oil were added. The addition of soybean oil practically eliminated reproduction. The beneficial effect obtained adding methylene blue to the acetostearin diet suggests that the acetostearin raised the vitamin E requirement by facilitating its destruction rather than by interference with its absorption.

Studies on the Hydrolysis of Lecithin by a Penicillium Notatum Phospholipase B Preparation. R. M. C. Dawson

(Biochem. Dept., Agr. Research Council, Inst. Animal Physiol., Cambridge). *Biochem. J.* **70**, 559–70 (1958). Studies of the hydrolysis of lecithin by phospholipase B preparations from *P. notatum* showed that the enzyme requires certain activating lipids in the system. Most effective lipids are cardiolipin, liver polyglycerolphospholipid and monophosphoinositide. Tripalmitin and tristearin were less effective. A variety of other lipids were tested. The lecithinase was inhibited by bivalent metal ions, and by fluoride. It is suggested that cardiolipin and monophosphoinositide are held at the surface of the lecithin particles and thereby introduce certain polar groups which are necessary for the enzymatic attack.

Patterns in Lipid Chemistry. J. A. Lovern (Dept. Sci. & Indus. Research, Torry Research Station, Aberdeen). *J. Sci. Food Agr.* **9**, 773–81 (1958). Unsaturation in fatty acids follows definite patterns. In the monoethylenic acids a nine-carbon chain occurs frequently on one side or the other of the double bond. The nonconjugated polyenoic acids fall mainly into three series (related to oleic, linoleic, and linolenic acids when considered from the terminal methyl carbon). This may result largely from positional limitations during metabolism of these acids by animals. There appear to be some common features in the patterns of enzymatic synthesis of triglycerides and phosphatides. When a lipid molecule includes more than one fatty acid radical, the enzyme systems responsible for esterifying the various sites often discriminate characteristically between saturated and unsaturated acids.

The Distribution of Tocopherols During the Life Cycle of Some Plants. J. Green (Walton Oaks Exptl. Station, Tadworth, Surrey). *J. Sci. Food Agr.* **9**, 801–12 (1958). Seeds of corn, wheat, barley and pea were germinated in the laboratory and plants were grown to maturity under field conditions. Using two-dimensional paper chromatography, detailed tocopherol patterns were determined at different stages of growth. The young plants synthesize predominantly α-tocopherol, whereas other isomers are specific products of the seeds. Theoretical implications and synthetic mechanisms are discussed. It is concluded that the tocopherols are interconvertible in plants.

The Biosynthesis of Fat in Submerged Cultures of Penicillium Spinulosum. I. R. Shimi (Botany Dept., Faculty of Science, Ain-Shams Univ., Cairo, Egypt). *J. Sci. Food Agr.* **9**, 824–8 (1958). During the first three days of growth of *P. spinulosum* in submerged culture, low concentrations of sugar promote growth and restrict synthesis of fat. Thereafter, increased sugar concentrations promote fat production.

Comparative Liberation of Bound Phosphatides from Red Cells of Man, Ox, and Camel. J. C. Turner, Helen M. Anderson, and C. P. Gandal (Columbia Univ. College of Physicians & Surgeons, New York). *Proc. Soc. Exptl. Biol. Med.* **99**, 547–50 (1958). Red cells of the camel are like those of true ruminants in being resistant to lysis by cobra venom but dissimilar in containing lecithin. Lipids in these cells were more difficult to extract with ether-ethanol mixtures than were the phosphatides in red cells from man and ox.

Influence of Sex and Dietary Phosphatides on Cholesterol Levels in Blood Plasma of Swine. E. G. Hill, J. J. Peifer, and W. O. Lundberg (Hormel Institute, Univ. Minnesota, Austin). *Proc. Soc. Exptl. Biol. Med.* **99**, 586–9 (1958). Body weights and blood lipid values were determined periodically in male and female miniature swine fed high-tallow diets supplemented with soybean phosphatides. Weight changes were not related to sex or variations in diet. The phosphatides appeared to counteract the hypercholesterolemic effect of the tallow diet. The alcohol-insoluble phosphatides (inositol phosphatides) may have been most active in this respect. Tetraenoic acid concentration of plasma tended to be higher in females than in males. There was no apparent correlation between changes in plasma polyunsaturated acids and changes in other plasma lipids.

Lipide Changes in Chylomicra and Subnatant Fractions of Rat Lymph During Cholesterol Absorption. C. H. Woo and C. R. Treadwell (Geo. Washington Univ. School of Med., Washington, D. C.). *Proc. Soc. Exptl. Biol. Med.* **99**, 709–12 (1958). Rats were fed emulsions containing cholesterol, oleic acid, triolein, and taurocholate in various combinations. Distribution of lipides in the chylomicron and subnatant fractions of the lymph was determined. Increases in lymph neutral fat were carried largely in the chylomicron fraction whereas increases in cholesterol were carried largely in the subnatant fraction.

Origin of Trans Fatty Acid in Human Tissue. Patricia V. Johnston, F. A. Kummerow, and C. H. Walton (Dept. Food Technol., Univ. Illinois, Urbana). *Proc. Soc. Exptl. Biol. Med.* **99**, 735–6 (1958). Samples of fat from human placental, maternal, fetal, and baby tissues were examined. While the maternal tissue contained considerable amounts of *trans* fatty acids, these lipids were not found to a measurable extent in placental, fetal or baby fats. The results indicate that *trans* fatty acids in human tissue must originate solely from dietary fat.

Action of N′,N-Diphenyl-p-phenylenediamine in Tocopherol Deficiency Diseases. H. H. Draper and A. S. Csallany (Div. Animal Nutrition, Univ. Illinois, Urbana). *Proc. Soc. Exptl. Biol. Med.* **99**, 739–42 (1958). Administration of DPPD to growing rabbits and rats fed a vitamin E-low diet did not modify the rate of depletion of this vitamin from the liver or muscle. DPPD was as effective as α-tocopherol in bringing about a remission of muscular dystrophy and creatinuria in rabbits maintained on a diet devoid of tocopherols. The ability of DPPD to partially regenerate sterile female rats maintained on vitamin E-free diet was confimed.

• Paints and Drying Oils

Spectrophotometric Examination of Linseed Oil During Standolization in an Inert-Gas Atmosphere. F. Minutilli (Univ. Rome). *Olii minerali, grassi e saponi colori e vernici* **35**, 2–3 (1958). Stand oils prepared in an inert gas atmosphere (carbon dioxide or nitrogen) are of better quality than are those prepared by heating air. Spectrophotometric examination of the behavior of the oil during heating shows that the amount of conjugated diene bonds increases with the time of heating; the ratio of two consecutive extinction coefficients tends to a constant value. (*C.A.* 52, 21155)

Transparent Resinous Substances. I. Katz and F. L. Thomas (Bjorksten Research Labs., Inc.). *U.S. 2,864,780.* A polymeric product is prepared by the reaction between castor oil, acetylated castor oil having an acetyl content about 38% of the hydroxyl content, pentane diol-1,5, and *m*-tolylene diisocyanate.

Interpolymers of Alkyd Resins, Vinyl Halides, and Vinyl Esters. R. M. Christenson (Pittsburgh Plate Glass Co.). *U.S. 2,865,874.* An interpolymer which is soluble in aromatic hydrocarbons and will dry to form durable protective films upon surfaces is prepared from (A) an alkyd resin which is the product of the reaction of a polyhydric alcohol, a dicarboxylic acid and an unsaturated fatty acid, (B) vinyl acetate, and (C) vinyl chloride.

• Detergents

The Colloid Chemistry of Soap-Cresol-Water Systems. VIII. Surface Tension of Cresol-Containing Soap Solutions. E. Angelescu and Y. Davidescu. *Kolloid Z.* **158**, 135–44 (1958). The changes in the surface tension of aqueous soap solutions were investigated as functions of concentration and temperature. Conclusions for systems with or without cresol additions: The surface tension increases with increasing soap concentration. The stearates show greater capillarity than do the palmitates. K soaps show greater capillarity than do Na soaps. With increasing temperature the surface tension of Na soaps increases and that of the K soaps decreases. With over 2% cresol the surface tension increases with increasing cresol additions up to 7%, this value is the same as that of pure cresol at the same temperature; it decreases for the isomers in the order o > m > p. Minimum surface tension is obtained with 1.2% cresol addition. This minimum value is more pronounced for the isomers in the order of o < m < p. It is assumed that the addition of cresol causes both a dispersion and a solvation of the soap particles. The cresol dipoles seem to penetrate between the oriented hydrocarbon chains and form a compound with the carboxyl groups of the soaps. This effect of the cresols increases for the isomers in the order o < m < p. (*C.A.* 52, 19346)

Where Are We Headed in Household Detergent Formulation? W. J. Beach (Sugar Beet Products Co., Saginaw, Mich). *Soap Chem. Specialties* **24**(12), 49–52, 241 (1958). The use of newer syndet types in such household products as home laundry detergents, detergent bars, dishwasher detergents, shampoos, antistatic cleaners, and all-purpose liquid detergents are reviewed and typical formulations listed. Trade name products are included. 20 references.

Fiber Swelling and Detergent Adsorption in Detergent/Textile Fiber Systems. H. C. Evans (Shell Research Ltd., Thornton Research Centre, P. O. Box 1, Chester, Eng.). *J. Colloid Sci.*, **13**, 537–52 (1958). The adsorption of sodium alkyl sulfates and sodium oleate on various textile fibers passes through a maximum, and sometimes subsequently a minimum, as the concentration of surface-active material in the aqueous phase is increased. The transverse swelling of single fibers, constant in dilute solutions of surface-active compound, decreases at the concentration corresponding to maximum adsorption. The shape of the adsorption/concentration graph can be explained on the basis of adsorption of single ions on a changing surface, and this hypothesis can also explain the dialysis of surface-active compounds. The effects of alkali and inorganic electrolyte on the adsorption isotherms are also discussed.

DETERGENTS CONTINUOUSLY. W. S. Fedor, B. Strain, L. Theoharous, and D. D. Whyte (Procter & Gamble, Cincinnati, Ohio). *Ind. Eng. Chem.* **51**, 13–18 (1959). Batch processes were the traditional way to synthetic detergents until Procter and Gamble developed a continuous process to make detergents. This process features a combination of a pump mixer and heat exchanger as the heart of the operation. These units are hooked together with enough piping to form loops or dominant baths. Flow rates and process variables are adjusted to cope with the tricky laws which govern chemical equilibrium. Oleum reacts with either fatty alcohols or alkylbenzene to make respective sulfates and sulfonates (and variations of the two) and these in turn, after blending with builders, dyes and the like are spray dried and made into Tide, Cheer, Dreft, and other products.

EFFECTS OF PRACTICAL SURFACTANT COMPOSITIONS UPON CRITICAL MICELLE CONCENTRATION MEASUREMENTS BY THE SPECTRAL DYE METHOD. M. E. Ginn and J. C. Harris (Monsanto Chem. Co., Dayton. Ohio). *J. Phys. Chem.* **62**, 1554–7 (1958). The spectral dye method is demonstrated as sensitive to surfactant-dye complex age, and to unsulfonated oil present in commercial dodecylbenzene sodium sulfonate. The solubilizing character of the oil-containing surfactant appears to account for anomalous results by the spectral dye method between commercial and purified surfactant, and compositions to which foam stabilizing agents were added. Methods for measurement of critical micelle concentration not affected by these factors are to be preferred when commercial surfactants and their combinations with detergent adjuncts are to be investigated.

BIOLOGICAL OXIDATION OF SUGAR-BASED DETERGENTS. P. C. G. Issac and D. Jenkins (Univ. Durham, Newcastle-upon-Tyne, Engl.). *Chem. & Ind.* (London) **1958**, 976–7. The behavior of C_{14}–C_{18} fatty acid esters of sucrose during sewage treatment was studied. The endogenous O uptake of varying concentrations of detergent in sewage-seeded B.O.D. dilution H_2O was measured. Sequol-260 increases the O uptake much more than Sucrodet D-600. Tetrapropylenebenzenesulfonate shows almost no O uptake. (*C.A.* **52**, 21173)

THE INFLUENCE OF VARIOUS ADDITIVES ON SOILING AND SOIL REMOVAL CHARACTERISTICS OF KNITTED FABRICS. L. G. Johnston *et al.* (Am. Inst. of Laundering, Joliet, Ill.). *Am. Dyestuff Reptr.* **47**, 933–40 (1958). An investigation has been conducted to determine the effect of selected additives on the soiling and soil-removal properties for a series of typical fibers. Generalized conclusions probably cannot be drawn from the data developed to date, but the following specific trends have been indicated by this study: 1) Surface-active agents, particularly nonionics, tend to decrease the dry soiling resistance of most fibers. 2) Of the additives tested, colloidal silica finishes, developed for use as soil retardants, significantly improve the soil resistance of all fibers except Dacron. 3) The soil resistance of Dacron is decreased when additives are applied. 4) Soil removal by washing generally remains unaffected by most additives.

INFLUENCE OF COMPOSITION OF FAT STOCK ON STRUCTURE AND PROPERTIES OF TOILET SOAP. Z. I. Kenigsberg. *Trudy Vsesoyuz. Nauch-Issledovatel. Inst. Zhirov.* **1954**, No. 15, 190–201. Milled soaps from various fats: tallow, bone fat, hydrogenated whale and cottonseed oils, coconut oil, and rosin, were prepared in a pilot plant. Physical and chemical properties of soaps and conditions of mechanical processing at various compositions of fatty acids were studied. Dependence of intersurface intervals in crystalline lattice of soap (by x-ray examination) from its fat composition was determined. Hydrogenated whale oil is a better raw material for toilet soap than is hydrogenated cottonseed oil. Use of hydrogenated whale oil with high titer (48°) as well as animal fats with high m.p. decreases plasticity of soap and contributes to cracking and breaking up of soap during use. Increase of oleic and palmitic acids in fat stock is recommended. Solid unsaturated fatty acids (*trans* isomers) hamper mechanical processing of soap and adversely affect its appearance. Toilet soap should contain less than 15% *trans* isomers of hydrogenated oils. Addition of 7% coconut oil or 15% of bone fat to fat stock considerably decreases the soap defects arising from the presence of *trans* isomers. (*C.A.* **53**, 739)

SOAPS AND SOAP SOLUTIONS. M. R. Perron. *Parfums, cosmet., savons* **1**, 308–17 (1958). The physiochemical properties of soap and soap solutions are reviewed. (*C.A.* **53**, 742)

CRYSTAL STRUCTURE OF SODIUM SOAPS. E. Segerman (Lever Brothers Co., Edgewater, N. J.). *Norelco Reptr.* **5**, 84–5, 94 (1958). A discussion of the chain-packing arrangements based on a reexamination of powder and fiber data of soap systems. (*C.A.* **52**, 19401)

ENERGETICS OF WASHING AND WASHING AGENTS. E. Walter. *Fette, Seifen, Anstrichmittel.* **59**, 966–72 (1957). Comparative tests as to cleaning effect, degree of whiteness, and textile influence show the advantages of built all-purpose washing agents. (*C.A.* **52**, 21173)

PROCESS FOR PREPARING SURFACE-ACTIVE MATERIALS. R. P. Louthan (Phillips Petroleum Co.). *U.S. 2,864,866.* A detergent composition, effective in cleaning nylon, wool, and mixtures thereof, is prepared by reacting an alkyl mercaptan of from 8 to 20 carbon atoms with an alkylene oxide to form the corresponding glycol thioether, and then contacting with hydrogen peroxide to form the corresponding sulfoxide.

DETERGENT COMPOSITION. P. T. Vitale (Colgate-Palmolive Co.). *U.S. 2,867,585.* Detergent compositions having controlled foaming characteristics consist of a water-soluble nonionic polyoxyethylene detergent condensate containing at least about 5 ethenoxy groups and a higher aliphatic alcohol containing about 12 to 20 carbon atoms as the foam depressant, the ratio of nonionic to alcohol being from about 25:1 to 4:1 by weight.

SYNTHETIC DETERGENT BAR COMPOSITIONS. J. K. Weil, A. J. Stirton, and E. W. Maurer (Secretary of Agriculture). *U.S. 2,867,586.* Synthetic detergent bars which are similar to human skin pH, are effective in hard water, have good lathering properties, and do not form curds can be made from a combination of the sodium or potassium salts of α-sulfonated long straight chain saturated fatty acids with the corresponding ammonium or substituted ammonium salts.

DETERGENT COMPOSITIONS. Unilever Ltd. *Brit. 800,291.* It has been discovered that the lathering properties, in particular the persistence of the lather during washing at normal concentrations, of many spray-dried organic soapless detergent compositions can be improved by the addition of certain 2-(C_{9-13})-alkyl-4,4-bishydroxymethyl-oxazolines to the slurry from which the detergent compositions are prepared.

DETERGENT COMPOSITIONS. Unilever Ltd. *Brit. 800,710.* It has been found that the lathering properties, particularly the persistence of the lather during washing at normal concentrations, of many organic soapless detergent compositions can be improved by addition of the N-tris-(hydroxymethyl)-methylamides of lauric, caprylic, myristic, palmitic and oleic acids and mixtures thereof.

DETERGENT COMPOSITION. R. S. Lumsden and M. J. Milner (Thomas Hedley & Co., Ltd.). *Brit. 801,018.* A powdered detergent composition is prepared in which there is thoroughly distributed a coloring material in such quantity and in such a fine state of subdivision that the composition is not appreciably colored thereby, but such that when the composition is dissolved or dispersed in water, the solution has a color characteristic of the dye or pigment.