ABSTRACTS

R. A. REINERS, Editor. ABSTRACTORS: J. G. Endres, J. Iavicoli, K. Kitsuta, F. A. Kummerow, H. S. Liles, C. C. Litchfield, Louise R. Morrow, E. G. Perkins, and T. H. Smouse

• Fats and Oils

SYNTHESIS AND PROPERTIES OF GLYCERIDES (a review). F. H. Mattson and R. A. Volpenhein (The Procter and Gamble Co., Miami Valley Lab., P. O. Box 39175, Cincinnati, Ohio). *J. Lipid Research* 3, 281–96 (1962). In this review is assembled information on the chemistry of glycerides. Information is presented under four headings: synthesis, stability, isolation, and analysis. 103 references.

DETERMINATION OF CHOLESTEROL AS THE TOMATINDINE USING THE IRON REAGENT. R. K. Rinehart, Suzanne E. Delaney, and H. Sheppard (Research Dept., CIBA Pharmaceutical Company, Summit, N. J.). *J. Lipid Research* 3, 383–85 (1962). The purpose of this investigation was to determine the feasibility of using the iron reagent with tomatine for the analysis of cholesterol. The iron reagent may be satisfactorily utilized for the determination of cholesterol in alcohol-acetone extracts of serum and tissue when tomatine is substituted for digitonin as the precipitating agent, provided the following precautions are taken: (1) more time must be allowed for precipitation of samples containing small amounts of cholesterol, and (2) more care must be exercised in handling and washing the precipitates.

A SENSITIVE AND SPECIFIC METHOD FOR PLASMALOGENS AND OTHER ENOL ETHERS. J. N. Williams, Jr., C. E. Anderson, and Alice D. Jasik (Lab. of Nutrition and Endocrinology, Nat'l Inst. of Arthritis and Metabolic Diseases, Nat'l Inst. of Health, Bethesda, Md.). *J. Lipid Research* 3, 378–81 (1962). A spectrophotometric procedure for estimating plasmalogens and other enol ethers, based upon the specific reaction of the enol ether group with iodine, is presented. Optimum conditions for iodination with respect to methanol and KI concentration, pH, and time of incubation have been defined. Reproducibility is ± 3.6% with 0.1 μmole levels of plasmalogen in lipid extracts. The range of enol ether estimated by this procedure is 0.02–0.125 μmole.

THE DETERMINATION OF ESTERIFIED FATTY ACIDS IN GLYCERIDES, CHOLESTEROL ESTERS, AND PHOSPHATIDES. W. D. Skidmore and C. Entenman (U. S. Naval Radiological Defense Lab., San Francisco 24, Calif.). *J. Lipid Research* 3, 356–63 (1962). The conditions for the hydroxamic acid reaction for determining esterified fatty acids have been modified to control the variable factors involved and to obtain molar absorptivities that are equivalent for amounts up to 8 μeq of ester. Control of the amount of water present during the formation of hydroxamates was the most important single factor in obtaining equivalent color values. The accuracy and precision of the method have been well defined by showing that the optical density values for five different ester standards were on the identical straight-line curve. The colored end-products gave identical spectral curves between the wavelengths of 410 mμ and 700 mμ whether they were derived from standard carboxylic acid esters, Folch extracts of rat serum, rat liver, or human serum. A long-chain cholesterol ester must be used as one of the standard esters because of its special solubility characteristics. Cholesteryl acetate *cannot* be used as a reliable representative in place of a long-chain cholesterol ester.

3,7,11,15-TETRAMETHYLHEXADECANOIC ACID, A CONSTITUENT OF BUTTERFAT. W. Sonneveld, P. Haverkamp Begemann, G. J. Van Beers, R. Keuning, and J. C. M. Schogt (Unilever Research Lab., Vlaardingen, Netherlands). *J. Lipid Research* 3, 351–55 (1962). By subjecting the fatty acid methyl esters from butterfat to fractional distillation, urea fractionation, and preparative gas-liquid chromatography, a fatty acid was isolated that was characterized and identified as 3,7,11,15-tetramethylhexadecanoic acid.

PURIFICATION OF C^{14}-LABELED FATTY ACIDS BY CHROMATOGRAPHY ON ACID-TREATED FLORISIL. K. K. Carroll (Collip Medical Research Laboratory, Univ. of Western Ontario, London, Ontario, Canada). *J. Lipid Research* 3, 388–90 (1962). A method for incorporation of radioactive carbon into either the 1- or 2-position of fatty acids was developed and was used to prepare 2-C^{14}-labeled erucic acid and nervonic acid for use in metabolic studies. When the labeled fatty acids were chromatographed on siliconized paper and the paper scanned for radioactivity, it was found that the fatty acids contained appreciable amounts of radioactive impurities. A simple method involving chromatography on acid-treated Florisil was developed, which eliminated most of the impurities and permitted recovery of the fatty acids in a high state of radiochemical purity.

POTENTIAL CONTAMINATION IN THE ANALYSIS OF METHYL ESTERS OF FATTY ACIDS BY GAS-LIQUID CHROMATOGRAPHY. F. T. Lindgren, A. V. Nichols, N. K. Freeman, and R. D. Wills (Donner Laboratory, Lawrence Radiation Lab., University of California, Berkeley). *J. Lipid Research* 3, 390–91 (1961). In gas-liquid chromatography (GLC), as in other microanalytical techniques, it is especially important to guard against the intrusion of contaminants. At the microgram level, contaminants may be introduced at any stage of sample handling or processing. Lipid extraction as well as subsequent lipid-separation techniques by silicic acid chromatography frequently require the use of relatively large volumes of solvents for the extraction or fractionation of relatively small amounts of lipids. It becomes very important to check all solvents used for potential contamination. In certain types of lipid extraction as well as during hydrogenation procedures, it may be necessary to use filter paper. It is absolutely essential to pre-extract such filter paper if used in connection with GLC work.

PAPER CHROMATOGRAPHY OF FATS I: QUALITATIVE AND QUANTITATIVE DETERMINATION OF HYDROXY AND KETO FATTY ACIDS. H. P. Kaufmann and Young Su Ko (Deut. Inst. Fettforsch., Münster). *Fette Seifen Anstrichmittel* 64, 434–438 (1962). Qualitative and quantitative paper chromatographic analysis of long-chain hydroxy and keto fatty acids on paper impregnated with undecane is described. Acetic acid of various concentrations is employed as the developing phase. The chromatograms are colored and the spots are visualized with copper acetate-verbeanic acid. For quantitation the visualized spots are measured photometrically. The following compounds were chromatographed: 2-hydroxylauric, -palmitic, and -myristic acids; 2-hydroxystearic, -arachidic, and -behenic acids; 2 methyl-4-keto-tridecanoic, -pentadecanoic, -heptadecanoic, -nonadecanoic, -hemicosanoic, and -pentacosanoic acids.

DISPROPORTIONATION OF TALL ROSIN WITH PALLADIUM CATALYST. Takeo Wakabayashi, Michio Yoshino, and Tetsuo Ikeda (Nippon Fats and Oils Co., Ltd., Amagasaki). *Yukagaku* 11, 28–35 (1962). The disproportionation of tall rosin with Pd-catalyst was investigated. The active carbon was the best as carrier and 1 part of Pd to about 100 parts of active carbon was suitable ratio. More catalyst, lower reaction temperature or shorter reaction time, permitted recovery of catalysts of improved activity. In the cyclic reuse of the recovered catalyst, the required amount of the catalysts was about 0.25% (2 cycles with 0.5%) in the average. In the additional use of catalyst, a mixture of new and recovered catalyst was more effective than the use of recovered catalyst first and then new catalyst. The requirement of the catalysts were about 0.13% and 0.2% on the average in the former system and the latter, respectively.

DISPROPORTIONATION OF TALL ROSIN UNDER HYDROGEN ATMOSPHERE. Takeo Wakabayashi, Michio Yoshino, and Tetsuo Ikeda (Nippon Oils and Fats Co., Ltd., Amagasaki). *Yukagaku* 11, 35–38 (1962). Disproportionation of tall rosin with Pd-active carbon catalyst under hydrogen atmosphere was investigated. The required amounts of the catalyst in disproportionation under hydrogen atmosphere was one-fifth of that in nitrogen, and the extinction coefficient of ultraviolet absorption spectra of the reaction product under hydrogen was reduced to a greater degree than under nitrogen. The reaction was not affected by the amount of hydrogen within the limit of conditions in experiment. The deterioration of activity of catalyst under hydrogen atmosphere was less than that under nitrogen, and therefore cyclic reuse of the catalyst was possible up to five times. When 0.1% of recovered catalyst is used, 0.03% of new catalyst should be added for each cycle. In this case, the consumption of catalyst for each run would become 0.03% at least.

INFLUENCE ON EMULSION POLYMERIZATION OF STYRENE AND BUTADIENE BY POTASSIUM SOAPS OF DISPROPORTIONATED ROSINS. Takeo Wakabayashi, Michio Yoshino, Kunishi Hatano, and Mitsuta Shibata (Nippon Oils & Fats Co., Ltd., Amagasaki). *Yukagaku* 11, 65–8 (1962). The yield of polymer was not affected by the disproportionated rosins having value less than 2.3 in extinction coefficient at 241 mμ (a_{241}) in ultraviolet absorption spectra, but those having values higher than 2.8 in a_{241} had a tendency to decrease the yield. The yield of polymer was not affected by the amount of unsaponifiable matter or free resin acid in the soap except when a large amount of free acid (over 15 in acid number) was present. The stabilities of various latexes were equal.

UTILIZATION OF RICE BRAN OIL. IV. SOLVENT EXTRACTION OF RICE BRAN OIL. Yasuhiko Takeshita, Yoshiki Ono, and Seiichi Maruyama (Tokyo Oil & Fat Co., Ltd., Edogawa-ku, Tokyo). *Yukagaku* 11, 5–10 (1962). The effect of drying of rice bran and its solvent extraction was compared with that of corn germ. In the case of corn germ, the area in the constant-drying velocity curve and hygroscopic velocity were smaller than that of rice bran; the curve of solvent extraction rate vs. moisture had a maximum at 3% moisture although the increase in the rate of extraction of the raw material was small. The quantity of miscella remaining in the extracted marc was less than one-third of that of rice bran. Extraction with hot solvent was more effective than the extraction with cold solvent with stirring of rice bran. The differences in properties of extracted oil from different solvents were slight although color differences were great. The color intensities of oils from the solvents were as follows: trichloroethylene:benzene:petroleum ether = 4:2:1. The freezing point of benzene in winter was lowered to −8° by mixing it with 30% of petroleum ether.

V. QUALITIES OF FOREIGN RICE BRAN AS THE RAW MATERIAL FOR OIL EXTRACTION. 2. Yasuhiko Takeshita, Kenzi Urakawa, and Yumi Watanabe. *Ibid.*, 11–14. Qualities of rice bran collected in southeastern Asia were compared with that of domestic product. The oil contents were in the range of 5.2–26.7% and these differences were due to the difference in the extent of polishing of rice and contamination of other substances such as rice hull and crushed rice. There were no striking differences in saponification number, iodine number and percentage of unsaponifiable substance of crude oils obtained from brans of different locations but the color of oil from bran of southeastern Asia was lighter than the domestic oil. Ultraviolet spectra of crude oils were given. The oil from bran of parboiled rice after storage for 1 year showed acid number less than 15.

VI. MOLECULAR DISTILLATION OF RICE BRAN OIL. Yasuhiko Takeshita, Yoichiro Kai, Yoshiki Ono, Hiroshi Nakagawa, and Tatsuo Hamada. *Ibid.*, 52–4 (1962). From the result of estimation of hydroxyl values of distillate and residue, the content of intermediate hydrolyzate in crude rice oils with various acid values is not great. The residue from oils of higher acid value contained higher amounts of unsaponifiable matter of high melting point than those having medium or low acid value. The bottoms showed poor appearance and was unsuitable as the raw material for edible oil. The amount of unsaponifiable matter was less than original oil having medium or low acid value, while it was higher than original oil having higher acid value.

STUDIES ON SELECTIVE HYDROGENATION OF FATTY OILS AND CATALYSTS. I. STUDIES ON HYDROGENATION WITH THE KW-TYPE AND ADKINS CATALYSTS. Kazutomo Maebashi (Asahi Electrochem. Ind., Ltd., Ogumachi, Arakawaku, Tokyo). *Yukagaku* 11, 60–4 (1962). Refined finback whale oil was hydrogenated under normal pressure of hydrogen and three different types of catalysts, namely: KW type (Japan. Patent 200,077), U-Ni-A (Japan. Patent 204,353), and reduced Ni-Cu catalysts. A micropenetration test was used to compare the products hydrogenated to an iodine number of about 70. The KW type catalyst was least sensitive to free fatty acid content of the raw material but lowering of acid number to less than 0.4 was indispensable if the catalyst was to be recycled. A simple method was proposed to regain and accelerate activity of the KW type catalyst by treating spent catalyst with alkaline solution under aeration. By applying the above treatment, the KW type catalyst could be re-used four times in the hydrogenation of whale oil. A refined sperm whale oil was hydrogenated with hydrogen at atmospheric pressure with 2% KW type catalyst and a light colored, almost odorless, stable product was obtained without any conspicuous change in its inherent characteristics. Two per cent Adkins catalyst, used to hydrogenate refined finback whale oil, was almost as active as the KW type and could also be re-activated and re-used by the above treatment.

II. STUDIES ON COPPER CATALYSTS. Kazutomo Maebashi and Motokazu Yano. *Ibid.*, 54–60. Highly active alkaline co-precipitated copper binary or ternary catalysts were obtained only when acidic metal containing solutions were poured into highly alkaline solutions. Through the above procedure, catalysts of different Cu:Cr molar ratios were prepared and their activities were compared. Co-precipitation of Cr in minor amount (Cu:Cr = 9:1 or less) yielded catalysts of satisfacory activity. Also, a marked increase in catalytic activity was induced by adding such metals as Zn, Al, and Co, whereas Cu alone proved to be almost inactive. These observations showed disagreement with the result reported heretofore, and support the theory of sintering prevention effect by the additives. Studies were made to decrease Ni in the Ni-Cu binary catalyst so as to make Cu predominant over Ni to avoid the inherent catalytic effect of the latter. Though the definite ratio was not determined, less than 1 mole Ni against 9 moles Cu gave an active catalyst. Solid fat index measurements on hydrogenated soybean oil and cottonseed oil indicated that the Cu-Ni catalyst produced hydrogenated products having a lower index than the KW type at the same iodine number down to about 70. The pH during co-precipitation affected catalytic activity. A pH above 9 for Cu:Ni (9:1) and pH above 8 for Cu:Cr (9:1) were suitable to obtain active catalysts. Five kinds of hydrogenated finback whale oil having almost the same iodine number (68–69) were prepared with Adkins, Cu:Cr (9:1), Cu:Al (3:2), Cu:Ni (9:1), and the KW type catalysts. The analytical data showed no significant difference between the three catalysts excepting the Cu-Ni and Adkins. The former made slightly harder products, the latter produced considerable amount of solid and isoöleic acids.

III. STABILITY COMPARISON OF SELECTIVELY HYDROGENATED FATTY OILS. Kazutomo Maebashi and Motokazu Yano. *Ibid.*, 19–24 (1962). In order to prepare samples for stability tests, hydrogenated fatty oils were treated with 1% boiling sulfuric acid, followed by washing with water, alkali refining, activated earth bleaching and deodorization. Such refining was found to be satisfactory for the purpose of eliminating copper and other pro-oxidant metals. A routine test for evaluating stability was proposed, comprising exposure of refined and deodorized specimens under direct sunlight or ultraviolet light and determining the order of their stability by organoleptic evaluation on the slightly reverted specimens. The results indicated that hydrogenated tallow, lard, and finback whale oil developed reversion flavor when their peroxide values were still well under 5 millieq./kg. Also, an evaluation was made on stability of five hydrogenated finback whale oils having almost the same iodine number (68–69) prepared with Adkins (Cu:Cr (9:1), Cu:Al (3:2), Cu:Ni (9:1), and KW (Cu:Cr:Mn) type catalysts.

EFFECT OF THE DEODORIZATION TEMPERATURE UPON THE QUALITY OF SOYBEAN OIL. Kosaku Yasuda, Hisashi Watanabe, and Toshikazu Tokunaga (Research Laboratory, Nissin Oil Mills, Ltd., Yokohama). *Yukagaku* 11, 2–5 (1962). The phenomena of flavor reversion and color reversion of refined soybean oil were investigated by the deodorization at 240C, 270C, and 295C. Increase in deodorization temperature tended to show a progressive decrease in tocopherol content and a higher color stability of deodorized oil, but it was accompanied with a progressive lowering of iodine number. As the deodorization temperature became higher, the linoleic and linolenic acid content of the deodorized oil decreased, while the conjugated diene content increased. Increase in deodorization temperature tended to lower the A.O.M. stability of deodorized oil. The A.O.M. stability was, however, fairly improved by adding citric acid to the deodorized oil. The formation of *trans*-acid became more marked as the deodorization temperature became higher.

PURIFICATION OF OILS AND FATS BY ION-EXCHANGE RESINS. V. DISTRIBUTION OF FATTY ACIDS AND ORYZANOL ADSORBED BY RESIN IN RICE BRAN OIL. Hiroshi Inoue and Tatsuo Noguchi (Ind. Research Inst., Hokkaido). *Yukagaku* 11, 45–9 (1962). The distribution of fatty acids and oryzanol absorbed in a bed of strongly basic anion exchange resin (OH type) was determined by passing through the rice bran oil and its methyl ester, respectively, dissolved in a mixture of benzene and methanol. The amount of oryzanol absorbed in the bed decreased remarkably when the ratio of the resin to the oil exceeded a certain limit. From the quantitative relation between oryzanol and fatty acids in the effluents, it is assumed that oryzanol once absorbed on the resin would be replaced by the fatty acids existing in excess.

VI. EFFECT OF FREE FATTY ACIDS OF CRUDE RICE BRAN OILS ON THE ADSORPTION OF ORYZANOL. *Ibid.*, 49–51. The adsorption of oryzanol by the resin was less when using crude oil lacking in freshness or having high acid number.

COMPOSITION OF FREE FATTY ACIDS IN NATURAL FATS AND OILS. E. H. Meursing (T. Duyvis N.V., Koog aan de Zaan, Holland). *Rivista Ital. Sost. Grasse* 4, 188–189 (1962). The article discusses differences in composition found between free fatty acids and natural triglycerides from which they were extracted. The lower iodine value of the free acids (in some cases, e.g. whale oil, as much as 35 units lower than in the triglyceride) is explained by the lipase's preferential attack on the triglyceride's *alpha* position, more often occupied by saturated acids.

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• *New Literature*

HAGAN CHEMICALS & CONTROLS, INC., new 16 page Bulletin MSP-260.1 reviewing Ring Balance Meters. (Controls Division, Hagan Center, P. O. Box 1346, Pittsburgh 30, Pa.)

ROGER GILMONT INSTRUMENTS, INC., new brochure illustrates recently developed instruments used for precise measurements of vacuum in various ranges. (1 Great Neck Rd., Great Neck, N. Y.)

WALWORTH-GROVE-ALOYCO'S Bulletin #205 describes and illustrates valves for chemical processing applications. (Sales Division of Walworth, 6529 Hollis St., Oakland 8, Calif.)

BARBER-COLMAN Co., has two new bulletins available upon request. Bulletin F-11413, describes the Series 8000 Two-Pen Recorder and F-11394, Series 8060 Quick Change Multipoint Recorder. Copies of a presentation on gas chromatograph detector systems, by R. E. Johnson of the Barber-Coleman Co. are also available. (Rockford, Ill.)

LAPINE SCIENTIFIC CO., has published their latest "LaPine Apparatus Review" No. 14, 1962, that lists many new products and models of laboratory instruments. (6001 S. Knox Ave., Chicago 29, Ill.)

RESEARCH SPECIALTIES Co. Review, Vol. 4, No. 5, shows two series of electrically heated, insulated Multi-Block Tube Heaters. (200 S. Garrard Blvd., Richmond, Calif.)

BECKMAN SCIENTIFIC AND PROCESS INSTRUMENTS DIVISION, announced the publication of two new brochures. Bulletin SC-4034, describes the Modular Sample Conditioners and No. 779-C, the DB Ultraviolet Spectrophotometer and its accessories. (Technical Information Dept., 2500 Harbor Blvd., Fullerton, Calif.)

MELETRON CORP., Engineering Manual available to anyone interested in the problems of sensing hydraulic and pneumatic pressures. (Dept. 374, 950 N. Highland Ave., Los Angeles 38, Calif.)

WOLVERINE TUBE, DIVISION OF CALUMET & HECLA, INC., released a 12 page catalog entitled "Wolverine Titanium Tube." (17200 Southfield Rd., Allen Park, Mich.)

THE HARSHAW CHEMICAL CO., has issued their new catalog "CHEMISCOPE"—The Scope of Harshaw Industrial Chemicals. (1945 East 97th St., Cleveland 6, O.)

FRIDEN, INC., have announced a 36 page booklet on the Friden Collectadata 30 System. (Promotion Planning Dept., 97 Humboldt St., Rochester 2, N. Y.)

DORR-OLIVER, INC., have revised their 16 page brochure entitled "Continuous Processing" listing the various types of processing equipment, systems, and services offered. (Bulletin No. 7005, Stamford, Conn.)

• *Industry Items*

GENERAL ANILINE & FILM CORP'S, Calvert City, Ky. Plant, has made plans to expand their facilities for the production of a vinyl ether series of products for commercial use. Plans are expected to be completed by the middle of next year.

THEODORE C. KIESEL, INC., Cincinnati, O., has been appointed to represent the full line of chemical products of Foremost Food and Chemical Co., Oakland, Calif., throughout Ohio and neighboring areas.

MONSANTO CHEMICAL CO. announced they will build the world's first plant designed to manufacture synthetic lactic acid. It is scheduled to be in operation by the last quarter of 1963 and will be located at their existing Texas City manufacturing plant.

The Oil Palm . . .

(Continued from page 15)

TABLE I
Manures for Young Palms

Type of soil	Time of Application	Fertilizer	Quantity
Muck soil	Nil	Nil	Nil
Alluvial clay loam	6 mo after planting	Mix X + Mg	½ lb per palm
	12 mo after planting	Mix X + Mg	½ lb per palm
	18 mo after planting	Mix X + Mg	¾ lb per palm
	24 mo after planting	Mix X + Mg	¾ lb per palm
	30 mo after planting	Mix X + Mg	1 lb per palm
	36 mo after planting	Mix X + Mg	1 lb per palm
	Every six months until palms come into bearing		
All other suitable soils	6 mo after planting	Mix X + Mg	1 lb per palm
	12 mo after planting	Mix X + Mg	1 lb per palm
	18 mo after planting	Mix X + Mg	1 ½ lb per palm
	24 mo after planting	Mix X + Mg	1 ½ lb per palm
	30 mo after planting	Mix X + Mg	2 lb per palm
	36 mo after planting	Mix X + Mg	2 lb per palm
	Every six months until palms come into bearing		

Some form of manuring is necessary on most soils in order to obtain high yields over a long period. The type and quantity of fertilizer mixture required depend on the type of soil in which the palms are grown. Tables I and II will enable the cultivator to calculate the requirements for his land. The recommended manures should be applied to the soil in a broad band around the palms just underneath the spread of the leaves. The manures should be lightly changkolled into the top soil.

Harvesting and Yields

After the third or fourth year in the field, separate bunches of male and female flowers develop in the leaf axils on the same palm. It is rare for male and female flower bunches to reach maturity at the same time on the same palm. Therefore, pollen from one palm usually fertilizes the female on another palm. Bunches of fruit which develop from female flowers usually ripen within a period of about 5½–6 months from the date of pollination (Fig. 7). If a dry spell occurs during development, this period may be extended by another month. An indication of the state of ripeness of fruit bunches is the color of the fruits on the bunch. These fruits are deep violet in color during development; as the bunches ripen, their color changes to an orange-red from the base of each fruit upward. When most of each visible fruit is orange-red in color, the bunch is said to be ripe. It is then possible to remove several fruits easily. During development of fruit bunches, oil is produced in the fleshy pulp and continues to be produced until the bunches are fully ripe. Ripe fruits, in addition to being orange-red in color, also become loose on the bunch. When the bunch starts to shed a few loose fruits it can be considered ripe for harvesting. When the bunches are cut, oil production ceases. If the bunches are left on the palm after they are ripe, the loose fruits fall from the bunches and become bruised. Bunches which have been harvested and stored dry out and the fruits become cracked. Cracking, bruising or over-ripening of fruits cause some of the oil to break down into free fatty acids. The quality and price of oil decrease as the fatty acid content increases. Therefore, in order to produce optimum yields of high quality oil, the bunches must be harvested when they are just ripe and taken at once to the factory for processing. Fatty acid formation is very rapid. In practice, every attempt should be made to process on the same day as the fruit is harvested. Harvesting is carried out at intervals of from 5–10 days. A harvesting knife, attached to a bamboo pole, is used for harvesting fruit bunches when they can no longer be reached with the chisel. The length of the pole varies with the height of the palms. With practice it is possible to use bamboo poles 35–40 ft long. The fruit bunch is harvested by first cutting through the supporting leaf-stalk and then the bunch-stalk. The number of leaves pruned should be restricted to the smallest number necessary to harvest a bunch. Harvested bunches and loose fruits are collected and carried to an appropriate point for transport without delay to the factory.

Table III estimates the approx yields under average conditions of soil, drainage and management. Variations in any or all of these three factors may have considerable effect on actual yields.

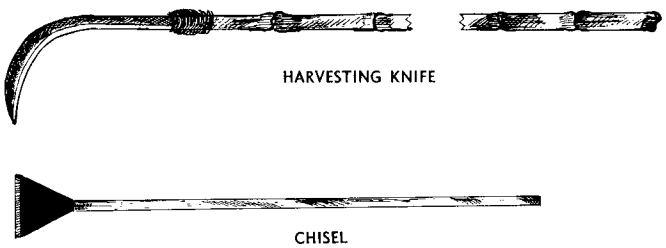

FIG. 6. Harvesting Implements.

Transport of Fruit

It has been emphasized already that it is important to transport harvested bunches to the factory quickly. To accomplish this it is essential that all parts of a group of holdings are accessible. A reasonable max carrying distances of 10 chains in the field requires some form of internal transport at 20-chain intervals. If roads can be built to take 3-ton lorries or tractors and trailers, newly harvested ripe fruit bunches could be loaded at collecting points and taken immediately to the factory. The criterion for the correct type of transport is that it must be able to remove all freshly harvested ripe fruit bunches to the factory for immediate extraction of oil.

TABLE II
Manures for Palms in Bearing
Time of Application—March and September Each Year

Type of soil	Fertilizer	Quantity
Muck soils	Nil	Nil
Alluvial clay loam	Rock phosphate Kieserite	1 ½ lb ½ lb } per palm
Shallow peat	Muriate of potash Magnesium limestone	1 ½ lb ½ lb } per palm
Upland loams (poor)	NPK 5	3 lb per palm
Upland loams (good)	RRI Type G Kieserite	2 lb ½ lb } per palm

Pests and Diseases

Diseases of the oil palm are not always easy to identify. Four common diseases are reviewed below.

1. *Stem Rot:* There may be no symptoms until the trunk of the palm breaks. The inside of the trunk will be brown and decayed. The diseased palm should be destroyed to avoid the spread of the disease. If burning is not possible, the palms should be buried. Stem rot can be preventd by careful pruning and harvesting. Avoid wounding the bases of growing leaves unnecessarily.
2. *Bud Rot:* The spear of unopened leaves collapses and can be pulled out from the bud cavity. When the decayed leaves are pulled out the palm usually recovers. New leaves develop.
3. *Crown Disease:* This is not a true disease. It is the effect of mechanical injury by Rhinoceros Beetle. Control of beetles is thereby necessary for prevention. Damage is caused by the beetle to the unopened leaves. When they open they are twisted and shrivelled. The injury is most severe in young

TABLE III
Estimated Annual Yields of Oil Palm Products from Palms of Varying Ages

Age of palm	Fruit bunches per palm per annum	Fruit bunches per acre per annum	Palm oil per acre	Palm kernels per acre
(Years)	(Katis)	(Pikuls)	(Pikuls)	(Katis)
4	45	22	3 – 3½	80
5	90	44	6½– 7	170
6	135	67	10 –10½	255
7	150	75	11 –11½	280
8	180	88	13 –13½	330
9	195	96	14 –14½	355
10 or more	200	98	14½–15	370

FIG. 7. (F) Partially pollinated Female Flower, among fruit bunches of various stages of ripeness.

palms. Damaged palms usually recover after about a year.

4. *Marasmius Disease:* This is a disease of fruit bunches. Normally the disease does not attack the fruits until just before they ripen. Attacked fruits decay. This disease is spread from unpollinated female flower bunches. Control of the disease is achieved by burning or burying the unpollinated female bunches when they begin to decay.

The three most important insect pests that attack oil palms in Malaya are shown in Table IV.

Animal pests are pigs, porcupines, and rats. Shooting is the most effective method of controlling pigs and porcupines. Hunting and trapping rats is advised. When the palms are in bearing, rats may damage the fruit bunches. Regular dusting of the developing fruit bunchs with barium carbonate prevents excessive damage.

TABLE IV
Details of Three Insect Pests of Oil Palm

Pests	Damage	Treatment
Rhinoceros beetle	Adult beetles attack the bases of leaf stalks and young unopened leaves.	The harmless grubs breed in old stumps, decaying timber, and other vegetation. Such breeding places should be destroyed. Hand collection of beetles and grubs may also be necessary.
Red stripe weevil	The grubs tunnel into the trunk. They can kill the palm.	Eggs are laid on wounded surfaces. Avoid excessive wounding of the palm when pruning leaves or harvesting bunches. Never cut the trunk of the palm. Prevent rhinoceros beetle from making wounds.
Nettle caterpillar	The leaves, usually of young palms, are eaten.	Hand collection of caterpillars and cocoons. The spines on the caterpillar are poisonous. Protect the hands when collecting.

Factory

As the fruits bunches come into the factory, they are weighed and then cooked in the sterilizer in order to loosen the fruits from the bunches. From the sterilizer, the bunches go into the thrasher. As the name implies, the individual fruits are thrashed out of the bunches. These loose fruits are then carried by bucket conveyor to the digestor where they are cooked into a mush. This mush is let into the press where the oil is expressed. The oil is pumped into the settling tanks where most of the dirt is settled out. The clean oil is then pumped through a clarifier which separates water and dirt from the clean oil. The pure oil that comes out of the clarifier is pumped to the storage tanks. From the press also comes the cakes which are sent to the fiber screen. In the fiber screen, the fiber is separated from the nuts. The nuts are dried in a silo and then cracked in the nut cracker. The cracked nuts are sent to a mud bath where the kernels are separated from the shell. The kernels are then dried in a kernel drier. When dried, they are sacked ready for export.

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BLEACHING OF VEGETABLE OILS. P. Fontana and O. Colagrande (Univ. Cattol., Piacenza). *Rivista Ital. Sost. Grasse* 4, 180–187 (1962). The properties of various earths in bleaching vegetable oils have been studied under atmospheric pressure, under vacuum, and under nitrogen atmosphere. The results show that Langmuir's equation is better suited than other mathematical relationships (e.g., Freundlich's) to interpret the adsorption phenomena connected with bleaching, especially in terms of the theoretical maximum color removal to be expected in the operation. In general, bleaching under atmospheric pressure is considerably more effective than bleaching under vacuum; however, bleaching under nitrogen gives slightly better results than bleaching under air at normal pressure.

VAPOR PHASE CHROMATOGRAPHY IN THE PRODUCTION OF COMMERCIAL STEARIC ACID. R. Aeschbacher (Steinfels Labor., Zürich, Switzerland). *Olearia* 2, 65–69 (1962). A gas chromatographic analysis was made of the methyl esters of crude tallow fatty acids as well as the various intermediate and end products of the commercial stearic and oleic acid industry. Results were in very good agreement with those obtained through chemical analysis.

• Fatty Acid Derivatives

ANTISTATIC EFFECT OF SURFACTANTS ON POLYPROPYLENE FIBERS. II. PROLONGED STORAGE AFTER APPLICATION. Koji Onoda and Yugo Saigusa (Miyoshi Oils & Fats Co., Ltd., Tokyo). *Yukagaku* 11, 69–72 (1962). Alkyl phosphates, quaternary ammonium type cationics, and betaine type amphoterics gave good results even after 90-day storage.

PROCESS FOR PREPARING A MIXTURE OF SOAP AND FATTY-ACYLAMINOMETHANE SULFONATE. A. Alsbury, K. A. Phillips, and B. Taylor (Lever Bros. Co.). *U. S. 3,047,509*. A fatty amide having from 10 to 18 carbon atoms is reacted with from 0.8 to 1.2 molecular proportions of sodium or potassium formaldehyde bisulfite in the presence of (a) from 15 to 40% by weight of the amide of a free fatty acid having from 10 to 18 carbon atoms and (b) from 1 to 26% of a water soluble alkali metal soap having from 10 to 18 carbon atoms. The reaction is conducted at a temperature of from 150 to 210C.

WATER-BASED DRILLING FLUID HAVING ENHANCED LUBRICATING PROPERTIES. M. Rosenberg and P. W. Schaub (Gulf Research & Development Co.). *U. S. 3,048,538*. The described composition consists of water and, as an extreme pressure lubricant additive, one of the following: fatty acids having at least 8 carbon atoms, sulfurized fatty acids having at least 8 carbons, alkali metal soap of fatty acids or sulfurized fatty acids. The fluid also contains calcium ions in a concentration above 150 p.p.m. high enough to form insoluble curds of calcium soap and a non-ionic surface active agent (polyoxyethylene derivative of alkyl phenols, alkyl glycols, or anhydroalkitol esters) in a concentration adequate to disperse the calcium soap.

• Biology and Nutrition

FORMATION AND FATE OF ENDOGENOUS TRIGLYCERIDES IN BLOOD PLASMA OF RABBITS. R. J. Havel, J. M. Felts, and C. M. Van Duyne (Cardiovascular Research Inst. and Dept. of Med., Univ. of Calif. School of Med., San Francisco, Calif.). *J. Lipid Research* 3, 297–308 (1962). The formation of hepatic triglyceride fatty acids from palmitate-1-C^{14} and their transport from the liver to the blood and from the blood to peripheral tissues were studied in rabbits. Isotopic equilibration of triglyceride fatty acids (TGFA) in subcellular compartments of the liver required up to 2 hr. Hepatic TGFA appear to be the immediate precursor of TGFA contained in very low-density lipoproteins of plasma. Isotopic transfer between hepatic TGFA and TGFA of very low-density lipoproteins occurred rapidly in relation to the turnover rate of TGFA in liver and plasma. Experiments in which labeled palmitate or labeled TGFA in very low-density lipoproteins were injected intravenously showed that the distribution in tissues of FFA is not affected by the nutritional state, but that of TGFA

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is markedly altered. About 20 times as much TGFA radioactivity was deposited in the adipose tissue of re-fed rabbits as in that of fasted animals, but oxidation was considerably less. The rate of esterification of FFA, however, depended greatly on nutritional state in adipose tissue and, to a lesser degree, in skeletal muscle and lung. These findings are discussed in relation to the roles of lipoprotein lipase activity and esterifying capacity of tissue in the fate of circulating FFA and TGFA.

THE ROLE OF DIETARY FAT IN THE UTILIZATION OF PROTEIN. I. QUALITY AND QUANTITY OF FAT. D. J. Naismith and Rahmat Ullah Quresh (Human Nutrition Research Unit, National Inst. for Med. Research, Mill Hill, London, England). *J. Nutrition* 77, 373–80 (1962). A study was made of the nutritive properties of a number of fats indigenous to the Pakistani dietary. Ghee, partially hydrogenated cottonseed oil, and mustardseed oil were incorporated in a Pakistani-type diet and fed, *ad libitum*, to weanling rats. The two saturated fats exerted a comparable effect on the rate and efficiency of growth, while the highly unsaturated mustardseed oil was found to inhibit growth and reduce the efficiency of food utilization. The adverse effect on mustardseed oil on growth was attributed to its content of erucic acid. When diets containing ghee, hydrogenated cottonseed oil, mustardseed oil, rapeseed oil, sunflowerseed oil, and lard were pair-fed to young adult rats, no differences in nitrogen retention were noted. The fats were aabsorbed to essentially the same extent. These experiments demonstrate that the protein-sparing property of a fat is independent of its degree of saturation and fatty acid composition. Nitrogen retention was compared under the extreme dietary conditions provided by feeding a fat-free diet and one rich in unsaturated fat (sunflowerseed oil). It was found that, as a source of energy in the diet, fat may be completely replaced with carbohydrate without adversely affecting the utilization of protein. These observations are discussed in relation to the calorie deficiency of the Parkistani diet.

THE ROLE OF DIETARY FAT IN THE UTILIZATION OF PROTEIN. II. THE ESSENTIAL FATTY ACIDS. D. J. Naismith (Human Nutrition Research Unit, Nat'l Inst. for Med. Research, Mill Hill, London, England). *J. Nutrition* 77, 381–86 (1962). Weanling rats were fed, *ad libitum*, diets containing 1% of hydrogenated coconut oil (essential fatty acid-free diet) or 7% of sunflowerseed oil (control diet). One per cent of cholesterol was incorporated into both diets to increase requirements for essential fatty acids (EFA's). Growth was markedly reduced with the EFA free diet, and characteristic signs of EFA deficiency developed within 5 weeks. Dietary cholesterol, per se, had no influence on protein metabolism.

SODIUM POLYETHYLENE SULFONATE: TISSUE DISTRIBUTION AND EFFECT ON C^{14}-1-PALMITIC ACID OXIDATION. W. L. Miller and J. J. Krake (Dept. of Metabolic Disease, The Upjohn Co., Kalamazoo, Mich.). *Proc. Soc. Exp. Biol. Med.* 110, 309–311 (1962). Neither injected sodium polyethylene sulfonate (PES) nor heparin affected the rate of oxidation of intravenously administered C^{14}-1-palmitic acid in rats whereas both agents increased the oxidation of C^{14}-1-tripalmitin. These findings are interpreted as indicating that PES and heparin increase the rate of oxidation of triglyceride fatty acids indirectly by increasing the rate of hydrolysis to fatty acids, which in turn are rapidly oxidized. When tritiated PES was given to dogs and rats, only a fraction of the dose was found in the urine. In rats about 50% was excreted in the urine and the remainder could be accounted for in various tissues; liver and skeletal muscle contained the most.

COMPARISON OF LARD, TALLOW, BUTTER, AND HYDROGENATED COTTONSEED OIL IN STARTERS AND OF PELLETED VS. NONPELLETED COASTAL BERMUDAGRASS HAY FOR CALVES. W. J. Miller (Dairy Dept., Univ. of Ga., Athens). *J. Dairy Sci.* 45, 759–64 (1962). A total of 99 calves was used in three experiments to study: (a) the effect of adding various fats to starters, (b) the influence of calcium level in high fat starters, and (c) the effect of grinding and pelleting vs. grinding Coastal Bermudagrass hay on calf performance. In Experiment 1, 56 baby calves were fed one of seven starters and pelleted or coarsely ground Coastal Bermudagrass hay *ad libitum* in an 8-wk growth trial. The addition of 10% butter, tallow, lard, or hydrogenated cottonseed oil to starters did not significantly ($P = 0.05$) affect weight gains, days of diarrhea, or hay consumption. Level of calcium in starters containing hydrogenated cottonseed oil had little influence on calf performance. Pelleting the hay approximately doubled its consumption and reduced the starter eaten, but did not affect the total amount of feed consumed. In cafeteria trials (Exp. 2) the con-

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Vitamin A in Margarine . . .

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TABLE IV

Calculated Potency of 4.5 mg Vitamin A in Various Commercial Sources by Various Assay Methods

Commercial type	Assay Method				
	Maleic value	Blue-color	$E_{uncorr.}$	USP XVI	Biological
All-Trans	5	15,000	14,900	14,800	14,800
Trans-Neo	33	15,000	14,500	13,600	13,400
Trans-Cis	33	15,000	13,700	12,900	10,800
Fish Liver Oil	33	15,000	13,800	13,100	11,400

have led to this estimate of isomer composition, on the average, for several fish liver oils studied: 52% all-*trans*, 25% 13-*cis*, 15% 9-*cis*, and 8% 9,13-di-*cis*. These are approximate; the actual figures are not significantly different from the 48-24-19-9 proportions mentioned above for the Trans-Cis synthetic vitamin A, and also for the equilibrium proportions estimated for those aqueous systems that induce isomerization.

Table II summarizes these estimates of isomer proportions in the four commercial vitamin A sources.

Assays on Commercial Vitamin A Sources

It is a simple matter to calculate the expected assay potency for a given mixture of isomers using the basic data in Tables I and II. Table III presents an example calculation of the biopotency of 4.5 mg of vitamin A having the isomer composition estimated for fish liver oil.

This type of calculation has been made for the four commercial sources, and for the four assay procedures. Table IV presents the estimates derived in this way.

One interpretation that can be made of Table IV is to consider that margarine samples are fortified at a level to give exactly 15,000 units per lb by blue-color assay, using four commercial vitamin A sources. The three right-hand columns show the assay results that would be expected

TABLE V

Assay Values for Margarine Containing 15,000 Biological Units per Pound

Commercial source of vitamin A	Assay method		
	Blue-color	$E_{uncorr.}$	USP XVI
All-Trans	15,200	15,100	15,000
Trans-Neo	16,800	16,200	15,200
Cis-Trans	20,800	19,000	18,000
Fish Liver Oil	19,700	18,200	17,200

(neglecting random assay variation, and effects of extraneous materials) by the other assay procedures.

Table V presents the same information, but on a different basis. Here it is assumed that margarine samples are fortified with that amount of each of the commercial sources necessary to give exactly 15,000 biological units per lb. The three columns present the assay results that would be expected (again neglecting random variation and effects of extraneous materials).

It is apparent that different physicochemical assay procedures give equivalent figures, agreeing within themselves and with biological potency, only when All-Trans vitamin A is used for the fortification of margarine. When other commercial vitamin A sources are used, physicochemical assays overestimate the biological potency by amounts dependent on the isomer composition of the vitamin A source.

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New Findings In Viscose Solutions

Researchers from Buckeye Cellulose Corp. have discovered the presence of a significantly greater number of very small particles in viscose than had previously been known to exist. Their studies show that viscose contains many more millions of gels of 0.2–0.3 μ in diameter than earlier researchers had suspected.

The significance of this discovery lies in the fact that gels may exert major influence on the filterability and spinnability of viscose.

Employing a combination of light scattering measurements, electron microscopy, light microscopy and an electric counter, identification of particles as small as 0.1μ in diameter was obtained. Previously, quantitative determinations on viscose fiber residues were limited to about 15 μ for direct studies on viscose, and limited to about 5 μ when the residues were isolated and redispersed.

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trol starter was decidedly more palatable than those containing added fat. The following order of decreasing palatability was indicated for the others: butter, lard, hydrogenated cottonseed oil, and tallow. Calves exhibited a decided preference for the pelleted hay.

CLINICAL STUDIES OF LONG-TERM ESTROGEN THERAPY IN MEN WITH MYOCARDIAL INFARCTION. Jessie Marmorston, F. J. Moore, C. E. Hopkins, O. T. Kuzma, and J. Weiner (Dept. of Med. and Public Health, Univ. of Southern Calif. School of Med., Los Angeles County Hosp., and Cedars of Lebanon Hospital, Los Angeles). *Proc. Soc. Exp. Biol. Med.* **110**, 400–08 (1962). In a clinical trial men with coronary artery disease who had recovered from a frank myocardial infarction were randomly treated with Lynoral (ethinyl estradiol), Anvene, Premarin, or a placebo. The 3 estrogen preparations were used in small well-tolerated doses of comparable potency as indicated by mild breast tenderness. No untoward effects of the treatment were observed in up to 60 months of continuous treatment. Changes in libido were rarely noted. Premarin therapy significantly improved survival, particularly in the first 2 years of treatment. Lynoral and Anvene had no effect on survival as compared with placebo treatment. Subclasses of patients most likely to benefit from Premarin therapy were those with relatively poor initial prognosis: men under age 55, who had a first myocardial infarction, and with complications of arteriosclerotic heart disease present. Lynoral and Anvene significantly lowered the cholesterol-phospholipid ratio. Premarin had no such effect. There is no necessary correlation between physical response (e.g. breast tenderness), serum lipid and survival effects of estrogen preparations in the male recovering from myocardial infarction: altering of the serum lipids does not necessarily improve survival, and survival may be improved without altering of the serum lipids.

HETEROGENEITY OF HUMAN SERUM BETA-LIPOPROTEIN. S. H. Lawrence and F. C. Shean (Veterans' Admin. Hosp., San Francisco, Calif., and School of Med., Univ. of Calif., Los Angeles). *Scienoe* **137**, 227 (1962). Human serum beta-lipoprotein (specific gravity 1.063 to 1.007) has previously been shown to form two lines on immunoelectrophoresis. In the study of a large number of individual sera it appears that both are not always present, that they are present in varying amounts in normal individuals, that a third form sometimes exists, that they are not separable by sedimentation techniques, and that they cross-react immunologically. These can also be demonstrated on starch gels and starch gel immunoelectrophoresis, one from entering the gel and the other remaining at the origin.

• Drying Oils and Paints

IDENTIFICATION OF CARBOXYLIC ACIDS IN ALKYD AND POLYESTER COATING RESINS BY PROGRAMMED TEMPERATURE GAS CHROMATOGRAPHY. G. G. Esposito and M. H. Swann (Coating and Chemical Lab., Aberdeen Proving Ground, Md.). *Anal. Chem.* **34**, 1048–52 (1962). A gas chromatographic procedure is proposed for identifying dicarboxylic and monocarboxylic acids present in alkyd and polyester coating resins. The method was effectively used to identify 19 of the most frequently encountered acids used in the production of synthetic resins. The technique involves transesterification of the resin with lithium methoxide to form methyl esters and subsequent separation by programmed temperature gas-liquid chromatography (PTGLC) on polar and nonpolar columns and identification by their relative retention.

FAST SURFACE-DRY OIL EMULSION PAINT. A. W. Schwab and H. M. Teeter (Sec'y of Agriculture, U. S.). *U. S. 3,047,413.* An ionic paint composition, washable from a paint brush in running water and which will, when in a film, air dry to touch at room temperature in about 10 to 30 minutes, consists of a potassium dimerate-assisted pH 8.5 aqueous emulsion of a highly bodied linseed oil having a Gardner-Holdt viscosity of Z_6, finely divided pigment solids suspended in the emulsion, a naphthenate dryer, and about 4% (based on the water) of hydroxyethyl cellulose. The hydroxyethyl cellulose is of such viscosity grade that a 1% aqueous solution has a viscosity of about 300 cps.

VINYL RESIN-EPOXY FATTY ACID COATING COMPOSITION, METHOD, AND ARTICLE. P. H. Rhodes and T. W. Findley (Swift & Co.). *U. S. 3,047,415.* A method of forming a hard, tough, flexible, adherent vinyl halide film consists of depositing a mixture of a vinyl chloride polymer and an oxirane-containing glyceride material having an oxirane content in excess of 8.5%, the oxirane groups of which are located in internal open chain portions of the glyceride molecule, onto the surface of an object, and then spreading the mixture to form a film. The object and supported film are heated to a temperature and for a time sufficient to set the mixture and form an insoluble, infusible film.

COATING MATERIAL AND METHOD OF DRYING SAME. B. L. Sites and M. S. Agruss (Miehle-Goss-Dexter, Inc.). *U. S. 3,047,422.* A printing ink consists of a nonaqueous solution of a drying oil binder having a conjugated system of double bonds and an oil-soluble dye capable of initiating the polymerization of the binder upon irradiation with actinic energy. The ink is free of any substance rendering it polymerizable by visible light and has a viscosity that enables it to be applied as a thin coating. A sheet is printed with the ink and irradiated with actinic energy, thereby rapidly indurating the ink.

• Detergents

APPLICATION OF AMPHOLYTIC SURFACE ACTIVE AGENTS IN TEXTILE INDUSTRY. IV. MEASUREMENT OF THE DRAWING FRICTION COEFFICIENT OF SYNTHETIC FIBER TREATED WITH AMPHOLYTIC SURFACE ACTIVE AGENTS. Akira Nagata, Yoshio Nemoto, and Wasaburo Kimura (Tokai Seiyu Kogyo Co., Ltd., Higashi-ku, Nagoya). *Yukagaku* **11**, 24–28 (1962). Ampholytics were found to be effective as antistatic agents and softeners, without effecting dyeing. In order to investigate the adaptability of ampholytics as oiling agent, the drawing friction of Bonnel (Mitsubishi Rayon Co.) fiber treated with it was measured. The minimum value of friction was observed at the concentration of 0.03–0.16% of 1-hydroxyethyl-2-heptadecyl-imidazolium betaine, 0.07–0.1% of *N*-lauryl-*N*,*N*-dimethyl-α-betaine, and 0.2–0.4% of oleic acid. For the oiling of Bonnel, much less amount of ampholytics are required as compared with oleic acid.

WATER NUMBER OF NONIONIC SURFACTANTS. III. POLYOXYALKYLENE DERIVATIVES OF FATTY ALCOHOLS. Kiyoyuki Tagawa, Shigenori Iino, and Noriaki Oba (Nihon Surfactants Ind. Co., Tokyo). *Yukagaku* **11**, 14–19 (1962). Water number of polyoxyethylene derivatives of fatty alcohol showed a tendency to increase linearly with an increase in number of moles of ethylene oxide, then it turned downward after reaching a maximum value. When the addition of ethylene oxide was above 100 moles, the water number was in the range of 10–12. When polyoxypropylene cetyl ether (CP) was the oleophilic group, the feature of increase in water number with an increase in number of moles of ethylene oxide was almost the same as in the case of usual nonionic surfactants. The solubility of these derivatives in water could be clearly classified by the magnitude of water number.

COSMETIC COMPOSITION AND PREPARATION OF THE SAME. T. Suzuki. *U. S. 3,046,199.* A cosmetic composition to be used for facial treatments consists of (1) 0.1 to 0.2% by weight of scordinine, (2) 0.01 to 0.1% of 4,4,4-trimethyl-3,3,3-triheptyl-8(2-thiazol)-2,2-pentamethinthiazolocyanine-3,3-diiodid, (3) 4 to 8% of stearic acid or palmitic acid, (4) 1 to 3% of at least one member selected from the group consisting of isopropyl palmitate, isopropyl myristate, lanolin, liquid paraffin, and squalene, (5) 0.7 to 1% of sodium stearyl sulfate, (6) 2 to 5% of at least one member of the group consisting of polyoxyethylene glycol stearate, stearic monoglyceride, polyoxyethylene sorbitan monostearate and sorbitan monostearate, (7) 0.5 to 1.2% of triethanol amine, (8) 4 to 12% of a propellant such as dichlorodifluoromethane, dichlorotetrafluoroethane, or butane, and (9) water.

DEFOAMING DETERGENT COMPOSITION. A. T. Martin and N. S. Temple (Economics Laboratory, Inc.). *U. S. 3,048,548.* A machine dishwashing composition consists of an inorganic alkali metal detergent salt and a small amount, sufficient to maintain wash pressure, of a polyoxyalkylene glycol mixture. The glycol mixture consists of a product which, statistically represented, has a plurality of alternating hydrophobic and hydrophilic polyoxyalkylene chains, the hydrophilic chains consisting of oxyethylene radicals linked one to the other, and the hydrophobic chains consisting of oxypropylene radicals linked one to the other. The product has 5 such chains comprising 3 hydrophobic chains linked by 2 hydrophilic chains. The central hydrophobic chain constitutes 30 to 34% by weight of the product, the terminal hydrophobic chains together constitute 31 to 39%, and the linking hydrophilic chains 31 to 35%. The intrinsic viscosity of the product is from 0.06 to 0.09 and the molecular weight from about 3000 to 5000.