ABSTRACTS

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

• Fats and Oils

FOAMING TENDENCIES OF FRYING OILS. II. FRACTIONATION OF THERMALLY OXIDIZED SOYBEAN OIL AND EVALUATION OF FOAMINESS BY GAS PUMPING METHOD. Shizuyuki Ota, Naoki Iwata and Masaharu Morita (Ajinonomoto Co., Tokyo). *Yukagaku* 13, 210–17 (1964). Thermal oxidation of soybean oil was carried out at 200C for 2, 4, 6 and 10 hours, and at 240C for 4 hours. The column chromatographic method was used to fractionate the foaming oil thus obtained. Silica gel (20 g) treated with 60 ml of *n*-hexane containing 5% isopropyl ether served as the solvent. Thermally oxidized soybean oil samples (0.5–1 g) were eluted with 100 ml of 15% isopropyl ether in hexane to give the first fraction (F_1); 100 ml of 60% isopropyl ether in hexane to give the second fraction (F_2), and with 100 ml ethyl ether to give the third fraction (F_3). Soybean oils with heating for 2, 4, 6 and 10 hours at 200C in the presence of air showed increase of F_2 and F_3, while a decrease was seen in F_1. The contents of F_1, F_2 and F_3 in soybean oil heated for 10 hours at 200C were 38, 35 and 25%, respectively. The physical and chemical characteristics, mean molecular weight and foaming tendencies of each fraction thus obtained were measured. The measurement of foaming tendency were carried out by the gas pumping method through a sieve plate which is suitable for treating of a small amount of sample. The results showed that the foaming of soybean oil was caused by the oxidative polymerized fraction therein. The reduction of carbonyls and epoxy group to hydroxyl in F_2 and F_3 with sodium borohydride caused more foaming, and the elimination of hydroxyl group caused less foaming, indicating that the polar fractions do exert on the foaming tendencies but would actually vary by the quantity or variety of the polar group formed.

LIPIDS OF EUPHAUSIACEA, EUPHAUSIA SUPERBA. I. ACETONE-SOLUBLE LIPID. Hideo Tsuyuki, Uhei Naruse, Atsushi Mochizuki and Shingo Ito (Nihon Univ., Tokyo). *Yukagaku* 13, 203–6 (1964). Fresh stomach contents of finback whale from the Atlantic Ocean consisted mostly of *Euphausia superba*. Extraction of this with acetone yielded 2.41% lipids, n_D^{30} 1.4671, acid no. 12.51, saponification no. 19.7, iodine no. 136.1, unsaponifiable matter 5.5%, phosphorus 0.02%, nitrogen 0.03%, choline 0.01%, ethanolamine 0.02% and sterol 16.51%. Alkali hydrolysis of the lipids yielded 31.8% saturated fatty acids (myristic 5.84%, palmitic 11.41%, stearic 10.19%, arachidic 4.15% and behenic 0.19%), 68.22% unsaturated fatty acids [0.36% C_{14} acid (−2H), 14.5% C_{16} acid (−2.3H), 24.97% C_{18} acid (−3.3H), 20.38% C_{20} acid (−6.2H), and 8.01% C_{22} acid (−5.4H)].

SOYSTEROL. IV. CONCENTRATION OF STIGMASTEROL BY SOLVENT-EXTRACTION OF SOYSTEROL. Tomishi Yamada and Tamotsu Hosono (Kanagawa Univ., Yokohama). *Yukagaku* 13, 200–2 (1964). Solubilities of stigmasterol and sitosterol (containing 5% of stigmasterol) and their acetates in 22 kinds of organic solvent were compared at 20 ± 0.1C. The differences in solubilities between sitosterol/stigmasterol were great in iso-butyl alcohol and *n*-amyl alcohol. Stigmasterol was obtained in high yield by use of above solvents. By use of above alcohols in the extraction of soysterol greater yields were obtained than by using of ethylene chloride-*n*-heptane.

A REVIEW ON RHEOMETRY. Munehiro Date and Eiichi Fukada (Inst. Phys. Chem. Research, Tokyo). *Yukagaku* 13, 52–62 (1964). 30 references.

RHEOLOGY OF EDIBLE FAT. Toshimaro Sone (Snow Brand Milk Products Co., Tokyo). *Yukagaku* 13, 93–100 (1964). A review with 20 references.

DIRECT EXTRACTION OF RICE BRAN OIL WITH LOWER ACID VALUE FROM RICE BRAN. Hiroshi Inoue and Tatsuo Noguchi (Ind. Res. Inst., Sapporo, Hokkaido, Japan). *Yukagaku* 13, 206–10 (1964). Rice bran containing 7.7% water, 20.75% oil with acid no. 27.8 was extracted in two steps of using methanol and hexane or benzene. Under suitable condition using methanol (temperature and the rate of flow) it was possible to obtain an oil with acid no. 3.0 in higher yield than using of usual alkali refining method. Ferulic acid ester was found mostly in a fraction of lower acid number.

STRUCTURAL HOMOGENEITY IN UNSATURATED FATTY ACIDS OF MARINE LIPIDS. A REVIEW. R. G. Ackman (Fisheries Res. Bd. of Canada, Technological Res. Lab., Halifax, N.S.). *J. Fish Res. Bd. Canada* 21, 247–54 (1964). Consideration of recent analytical data supports the conclusion that the longer-chain polyunsaturated fatty acids of marine origin are all structurally homogeneous in that the double bonds are *cis*, the double bonds methylene interrupted, and that, with the exception of the C_{16} chain length, the ultimate double bond will normally be three, six or nine carbon atoms removed from the terminal methyl group

COD LIVER OIL: COMPONENT FATTY ACIDS AS DETERMINED BY GAS-LIQUID CHROMATOGRAPHY. R. G. Ackman and R. D. Burgher (Fisheries Res. Bd. of Canada, Technological Res. Lab., Halifax, N.S.). *J. Fish. Res. Bd. Canada* 21, 319–26 (1964). The component fatty acids of cod liver oil from a single fish have been determined by gas-liquid chromatography on several polyester columns with identifications by the linear log plot and separation factor procedures. A number of acids have been detected which are not listed in recent comparable studies.

COD FLESH: COMPONENT FATTY ACIDS AS DETERMINED BY GAS-LIQUID CHROMATOGRAPHY. R. G. Ackman and R. D. Burgher (Fisheries Res. Bd. of Canada, Technological Res. Lab., Halifax, N.S.). *J. Fish. Res. Bd. Canada* 21, 367–71 (1964). The fatty acids of cod fish, chiefly derived from the phospholipids, are characterized by a very high proportion of polyunsaturated fatty acids and a very low proportion of monoethylenic fatty acids. There appears to be a correlation in the ratios of certain polyunsaturated fatty acids in the liver fatty acids and in the flesh fatty acids.

COD ROE: COMPONENT FATTY ACIDS AS DETERMINED BY GAS-LIQUID CHROMATORGAPHY. R. G. Ackman and R. D. Burgher (Fisheries Res. Bd. of Canada, Technological Res. Lab., Halifax, N.S.). *J. Fish. Res. Bd. Canada* 21, 469–75 (1964). The component fatty acids of cod roe resemble the flesh lipid fatty acids to a considerable degree. Comparison with the liver lipids of male and female fish suggests that less essential longer-chain monounsaturated fatty acids from the liver depot fat are metabolized by the female for the synthesis of particular fatty acids required by the developing eggs.

THE ACTION OF PANCREATIC LIPASE ON NATURAL AND SYNTHETIC GLYCERIDES. DETERMINATION OF RE-ESTERIFIED OILS AND THEIR BLENDS WITH VIRGIN OLIVE OILS. F. Mazuelos, A. Vazquez, F. Ramos and J. M. Martinez (Instituto de la Grasa y sus Derivados, Sevilla, Spain). *Grasas y Aceites* 15, 12–16 (1964). Virgin and re-esterified olive oils were subjected to pancreatic lipase hydrolysis. The resultant monoglycerides were separated by thin layer chromatography, and their fatty acid composition determined by gas-liquid chromatography. Palmitic and stearic acids were mainly esterified to the 1,3-positions in virgin olive oil, but were evenly distributed between the 1,2 and 3-positions in the re-esterified oil. When blends of virgin and re-esterified olive oils were subjected to lipase analysis, as little as 25% re-esterified oil in virgin olive oil could be detected.

NEW PROCESSES FOR STANDARDIZING VEGETABLE OIL MILLS AND REFINERIES. C. von Erhardt. *Grasas y Aceites* 15, 17–30 (1964). New developments in the unit processes used in oil mills and refineries are reviewed.

ANALYTICAL DETERMINATION OF RE-ESTERIFIED OLIVE OIL. F. Adam. *Lipidos* 22, 117–119 (1963). Review.

EXTRACTION OF OLIVE OIL BY THE "EXTRAOIL" PROCESS. D. Daniel. *Lipidos* 22, 111–112 (1963). Review.

DESIGNING A PLANT FOR DRYING AND SOLVENT EXTRACTING OLIVE OIL FROM "ORUJO." B. Espuny. *Lipidos* 22, 113–116 (1963). Formulas for estimating the drying, extraction, and storage capacity needed in a plant processing olive oil "orujo" are developed.

PROSPECTING FOR URANIUM BY ANALYSIS OF OLIVE OIL MILL WASTE. II. J. M. Martinez, E. Bermudez, C. Gomez, and C. Janer (Instituto de la Grasa y sus Derivados, Sevilla, Spain). *Grasas y Aceites* 15, 1–5 (1964). The uranium content of the oil, cake, and waste water ("alpechin") from olive oil

mills was studied to determine the distribution of the small uranium content of olives. Uranium was present only in the "alpechin," from which it could be concentrated by colloidal precipitation. The lipoprotic membrane surrounding dispersed oil droplets in the "alpechin" was found to contain up to 12% uranium.

THE EFFECT OF CARRIER GAS PURITY IN THE QUANTITATIVE GAS CHROMATOGRAPHY OF FATTY ACIDS. E. Tiscornia and L. Boniforti (Instituto di Sanita', Rome, Italy). *Riv. Ital. Sostanze Grasse* **41**, 140–3 (1964). Gas chromatography of mixtures of fatty acid methyl esters using H_2 as the carrier gas have given values of the unsaturated C-18 acids consistently and importantly lower than those obtained with He as the transport gas. Such differences were unexplained, since the thermal conductivity of the two gases is practically identical. Neither the type of chromatograph, nor the type of liquid and stationary phases employed were found to have any effect on the unsaturated C-18 level analyzed. When high purity H_2 gas was used, however, the analysis gave results identical to those obtained with He as the carrier gas. The importance of using chromatographically pure hydrogen (especially low in CO, H_2S and hydrocarbons) was thus confirmed.

GAS CHROMATOGRAPHIC ANALYSIS OF FREE FATTY ACIDS. F. J. Kabot, W. Averill and L. S. Ettre (Perkin-Elmer Corp., Norwalk, Conn.). *Riv. Ital. Sostanze Grasse* **41**, 131–8 (1964). Fatty acid mixtures are usually chromatographed after transformation to methyl esters. The reason for this is that when free fatty acids are injected into a chromatographic column partial dimerization and adsorption take place and the peaks exhibit severe tailing, giving inadequate quantitative results. Raupp and Metcalfe first realized the possibility of analyzing fatty acids without prior esterification, by using a strongly acidic additive in the liquid phase, thus obtaining better peak symmetry. Two different approaches to free fatty acids chromatography, are described, one with open tubular (Golay type) columns, using a strongly acidic (C_{54} tribasic acid) and a naphthalenedisulfonic acid additive, the wall of the column being also coated with a similar liquid. The second approach consists in using a completely inert support material (Teflon) and butanediol succinate or trimer acid as the liquid phase. The quantitative aspects of the use of both types of columns are discussed.

RAPID DETERMINATION OF TRICRESYLPHOSPHATE IN VEGETABLE OILS. P. Armandola. *Ind. Aliment.* **3**, 33–34 (1964). Vegetable oils for non-edible industrial use are often denatured with tricresylphosphate. Cases of edible oil adulteration can be detected by analysis of this compound, however, the method currently used is not very rapid. A new method, by which up to thirty samples per day can be analyzed, is described. The method can detect adulteration levels of 0.5–1.0% and upwards.

ANALYSIS OF ISOPROPYL ALCOHOL IN OLIVE OIL. P. G. Garoglio and G. Boddi Giannardi (Univ. of Florence, Italy). *Olearia* **18**, 5–8 (1964). Olive oil is sometimes refined by addition of caustic to a solution of the oil in hexane in the presence of isopropyl alcohol that solubilizes the resulting soaps. Commercial oils treated in this manner have sometimes been found to contain traces of isopropyl alcohol. A method for the analysis of the alcohol, based on its oxidation to acetone, is described.

GAS CHROMATOGRAPHY AND THE CHEMISTRY OF CEREALS. F. Muntoni, E. Tiscornia and G. DeGiuli (Ist. di Sanita', Rome, Italy). *Riv. Ital. Sostanze Grasse* **41**, 154–6 (1964). The fatty substance present in hard and tender wheat flour has been analyzed by gas chromatography. The average composition of the fatty substance extracted from soft wheat flour is: C-16, 18–20%; C-18, 0.5–1.0%; C-18:1, 12–15%; C-18:2, 61–65%; C-18:3, 3–5%. The fat from hard wheat flour was found to have a slightly different composition: C-16, 19–23%; C-18, 1.0–1.7%; C-18:1, 16–20%; C-18:2, 54–58%; C-18:3, 2.8–4.7%.

APPLICATIONS AND EXAMPLES OF HIGH RESOLUTION NMR. A. Melera (Varian AG Res. Lab., Zürich, Switzerland). *Riv. Ital. Sostanze Grasse* **41**, 70–4 (1964). The most interesting applications of NMR spectroscopy are represented by molecular structure determinations, particularly in the case of complex organic molecules. Some applications of proton resonance spectra are described, with examples related to the problems of analysis of mixtures, relative position of atoms and chemical bonds and spatial arrangement of chemical bonds.

INFRARED SPECTRA OF GAS CHROMATOGRAPHIC FRACTIONS OF FATTY ACID METHYL ESTERS, II. F. DeFrancesco (Prov. Agric. Inst., SanMichele Adige, Italy). *Riv. Ital. Sostanze Grasse* **41**, 20–5 (1964). Samples of pure *trans* methyl oleate and methyl oleate fractions obtained by gas chromatography of vegetable oils have been examined by I.R. spectrophotometry with expanded band. Precise measurements on the pure *trans* methyl ester have shown a peak at 967.7 cm^{-1}, instead of 965.0 cm^{-1} as stated in the literature. On the other hand, a peak is also found in the methyl esters from vegetable oils at 963.1 cm^{-1}. It appears that the frequency given in the literature as characteristic of the *trans* isomer is actually an average of the frequency of the pure *trans* isomer and a frequency found (although not always) in the *cis* isomer. Accurate wavelength measurements are therefore a necessary requisite for the I.R. determination of *trans* isomers in the presence of oleic acid.

QUANTITATIVE ANALYSIS OF TRIGLYCERIDES. G. Jurriens (Unilever Res. Lab., Vlaardingen, Netherlands). *Riv. Ital. Sostanze Grasse* **41**, 4–6 (1964). Triglycerides can be separated according to the number and geometry of their double bonds by a thin layer chromatographic method using silica gel impregnated with silver nitrate. After separation the bands are made visible with U.V. light by spraying with an alcoholic solution of 2,7-dichlorofluorescein. The glycerides are then extracted from the adsorbent by means of ether. The method combines the advantages of both column and thin layer chromatography, i.e. larger amounts of substance can be separated quickly.

DUAL COLUMNS. THE DIFFERENTIAL FLAME IONIZATION DETECTOR SYSTEM AND ITS APPLICATION WITH PACKED AND GOLAY COLUMNS. L. S. Ettre *et al.* (Perkin-Elmer Corp., Norwalk, Conn.). *Riv. Ital. Sostanze Grasse* **41**, 79–88 (1964). The application of the dual column technique in programmed temperature gas chromatography has opened new possibilities to high temperature analysis. Until now, however, the systems have had relatively limited sensitivity. Details of the newly developed differential flame ionization detector system and its application to both packed and open tubular (Golay type) columns are discussed. The sensitivity of the system is illustrated with examples from several fields, such as tars and petroleum products, fatty acid esters, steroids, natural waxes, plasticizers and beverages. Finally, the quantitative accuracy of the system is demonstrated with some examples.

THE DETERMINATION OF METHYL ESTERS OF POLYUNSATURATED ACIDS BY GAS-LIQUID CHROMATOGRAPHY. T. Gerson, J. E. A. McIntosh and F. B. Shorland (D.S.I.R. Fats Research Lab., Wellington, New Zealand). *Biochem. J.* **91**, 11C (1964). Analysis of a mixture of methyl linolenate and methyl stearate indicated a loss of approximately 50% of the linolenate. When shark-liver oil was analyzed, 51% of the polyunsaturated C_{20} and 86% of the C_{22} acids were lost. These results emphasize the desirability of confirming by methods other than gas-liquid chromatography the amounts of polyunsaturated constituents. Investigations in progress indicate that the loss of polyunsaturated acids may be largely eliminated by the use of less polar solid supports without recourse to coating with surface deactivators such as hexacethyldisilazane.

WIDE-RANGE PROGRAMMED TEMPERATURE GAS CHROMATOGRAPHY IN THE SEPARATION OF VERY COMPLEX MIXTURES. C. Merritt, Jr., J. T. Walsh, D. A. Forss, P. Angelini and S. M. Swift (Pioneering Res. Div., U. S. Army Natick Lab., Natick, Mass.). *Anal. Chem.* **36**, 1502–8 (1964). The range of programmed cryogenic temperature gas chromatography has been widened to include temperatures from −196C to over +200C. Various and veriable rates of temperature rise may be employed and automatic programming can be provided. The necessity for employing very low starting temperatures for mixtures containing very volatile components is demonstrated, and an example of a separation of a mixture of compounds having a boiling range from −161C to +200C is given. The technique has been applied to the total analysis of the carbon dioxide, center cut, and water fractions of the volatile compounds from irradiated beef. The efficacy of the separations enhances the use of a rapid scanning mass spectrometer for identification of the components in the eluate.

CONCENTRATION AND MASS FLOW RATE SENSITIVE DETECTORS IN GAS CHROMATOGRAPHY. S. Halaśz (Inst. für Physikalische Chemie

der Universität, Frankfurt am Main, W. Germany). *Anal. Chem.* 36, 1428–30 (1964). The detectors are grouped into two families. The characteristic features of these groups are described. The advantages of the mass flow rate sensitive detectors in quantitative analysis are set forth. Use of a scavenger gas in concentration sensitive detectors is discussed.

CHARACTERIZATION AND SEPARATION OF AMINES BY GAS CHROMATOGRAPHY. W. J. A. Vanden Heuvel, W. L. Gardiner and E. C. Horning (Lipid Res. Center, Dept. of Biochemistry, Baylor Univ. College of Med., Houston, Texas). *Anal. Chem.* 36, 1550–60 (1964). The separation, identification and estimation of biologically important amines by gas chromatographic methods presents a number of unresolved problems. The use of appropriate derivatives and selective stationary phases permits a wide choice of conditions which may be used to increase or decrease volatility of the compounds under study and to improve both separation patterns and the quantitative aspects of analytical separations. These experimental variables have been less thoroughly investigated for amines than for many other substances. Accordingly, a study was carried out of several groups of amines as model substances with different kinds of structure (long chain and alicyclic monoamines, aliphatic diamines and aromatic amines) with the aim of obtaining basic information which might be used in biochemical separation problems. At the same time, observations were made with respect to relationships between gas chromatographic behavior and the structures of amines and their derivatives.

MEASUREMENT AND INTERPRETATION OF THE C TERMS OF GAS CHROMATOGRAPHY. J. C. Giddings and P. D. Schettler (Dept. Chemistry, Univ. of Utah, Salt Lake City, Utah). *Anal. Chem.* 36, 1483–9 (1964). This work deals with the significance of the nonequilibrium or C terms in gas chromatography. It is shown, first, that the C terms have an important role in column resolution. Two new methods are then proposed for the experimental isolation of liquid and gas contributions, C_l and C_g. These methods are applied to a conventional GLC column, a glass bead column, a preparative column and a gas solid column. The experimental results are combined with theoretical interpretations to evaluate the changing role of the C terms in different kinds of columns. The experimental characteristics and problems of each of these systems are discussed and compared.

SEPARATION OF LIPIDS BY SILICA GEL G COLUMN CHROMATOGRAPHY. Q. E. Crider, P. Alaupovic, J. Hillsberry, C. Yen and R. H. Bradford (Oklahoma Med. Res. Inst. and Dept. of Biochemistry, Oklahoma Univ. School of Med., Oklahoma, Okla.). *J. Lipid Res.* 5, 479–81 (1964). A column chromatographic procedure utilizing silica gel G is described for separating lipid components of serum and lipoproteins into individual fractions containing hydrocarbons (I), cholesterol esters (II), triglycerides (III), cholesterol (IV), free fatty acids (V) and phospholipids (VI). Silica gel G required no pretreatment except adjustment of moisture content to 10%. The method affords a rapid, complete separation of all major lipid classes except diglycerides. Recoveries of serum and tissue phospholipids were approximately 60–80%, whereas those of the other major lipid classes were essentially quantitative.

A SOURCE OF CONTAMINATION IN THE ULTRAMICRO ANALYSIS OF METHYL ESTERS OF FATTY ACIDS BY GAS-LIQUID CHROMATOGRAPHY. P. V. Johnston and B. I. Roots (Dept. of Anatomy, Univ. College, London, England). *J. Lipid Res.* 5, 477–8 (1964). Contaminants which could be erroneously identified as methyl esters of fatty acids on gas-liquid chromatographic (GLC) analysis were traced to anhydrous methanolic HCl used for methanolysis. Further studies indicated that the artifacts are not esters of carboxylic acids even though they mimic them on GLC analysis.

ISOLATION AND FATTY ACID COMPOSITION OF THE PLANT SULFOLIPID AND GALACTOLIPIDS. J. S. O'Brien and A. A. Benson (Dept. of Marine Biology, Scripps Inst. of Oceanography, Univ. of Calif., La Jolla, Calif.). *J. Lipid Res.* 5, 432–6 (1964). The plant sulfolipid has been isolated from *Chlorella pyrenoidosa* cells and from alfalfa leaves by chromatography on Florisil and DEAE cellulose columns. The galactolipids, galactosyl diglyceride and diaglactosyl diglyceride were isolated by further chromatography on silicic acid columns. The galactolipids from alfalfa leaves were highly unsaturated and contained 87–94% linolenic acid, while the sulfolipid contained approximately equal amounts of palmitic and linolenic acids.

QUANTITATIVE SEMIMICRO ANALYSIS OF TRIGLYCERIDE FATTY ACID DISTRIBUTION IN A CONGO PALM OIL. G. Jurriens, B. De Vries and L. Schouten (Unilever Res. Lab., Vlaardingen, The Netherlands). *J. Lipid Res.* 5, 366–8 (1964). The triglycerides of a

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Room Assignments for Committee Meetings During Fall Meeting

Enthusiastic response from the chairmen of the Administrative and Technical Committees has made it possible to schedule many of the committee sessions which will be held during the Fall Meeting in Chicago.

As the Journal goes to press, the following dates, times and meeting rooms assigned are indicated in the tabulation below. Chairmen who wish to schedule additional meetings of their committees are urged to contact AOCS Fall Meeting Hotel Chairman S. C. Miksta, National Dairy Products Corp., Research and Development Div., Glenview, Ill. 60025, as promptly as possible.

AOCS Committee Room Assignments
Fall Meeting—Chicago
October 11–14, 1964

Sunday, Oct. 11, 1964	Parkview Room	Victorian Room	Columbian Room	Music Room
10:00–12:00 noon		Examination Board		
1:00– 6:00 p.m.	Governing Board			
Monday, Oct. 12, 1964				
8:00– 9:00 a.m.	Literature Review Comm.			
9:00–10:00 a.m.	Literature Review Comm.	Fatty Nitrogen Sub-Comm.	Neutral Oil Loss Sub-Comm.	
10:00–12:00 noon		Fatty Nitrogen Sub-Comm.		
2:00– 3:00 p.m.	Soap & Synthetic Detergent Analysis	Epoxidized Oils Sub-Comm.		Local Section Liaison
3:00– 4:00 p.m.	Soap & Synthetic Detergent Analysis		Dibasic Acids Sub-Comm.	
4:00– 5:00 p.m.		Education Comm.		Uniform Methods Comm.
Tuesday, Oct 13, 1964				
9:00–10:00 a.m.	Journal Advertising Comm.	Hydrog. Oils Sub-Comm.		Standards Comm.
10:00–11:00 a.m.	Journal Advertising Comm.		Commercial Fatty Acids Sub-Comm.	
11:00–12:00 noon		Drying Oils Sub-Comm.		
2:00– 3:00 p.m.	Membership Comm.	Polymerized Acids Sub-Comm.	Instrumental Techniques Comm.	Bleaching Methods Sub-Comm.
3:00– 4:00 p.m.				
4:00– 5:00 p.m.	Commercial Fats & Oils Analysis Comm.	National Program & Planning Comm.		
Wednesday Oct. 14, 1964				
8:00– 9:00 a.m.		Abstracts Comm.	Journal Comm. Breakfast	
9:00–10:00 a.m.	Industrial Oils & Derivatives Comm.	Abstracts Comm.	Journal Comm. Breakfast	Biochemical Methods Comm.
10:00–11:00 a.m.	Industrial Oils & Derivatives Comm.			