

## Chicago Convention News

The convention was formally opened on Monday morning October 30, 1962, by general chairman A. A. Rodeghier. The gathering was welcomed to Chicago by the mayor's representative, and president Baldwin gave a short introductory talk.

V. C. Mehlenbacher was given a testimonial plaque, in appreciation for his loyal and generous service as chairman of the Fat Analysis Committee from 1939 to 1961. The plaque was presented on behalf of the Society by C. W. Hoerr, member of the Governing Board.

Mehlenbacher had been recognized publicly at a previous meeting of the Society for his contributions as editor of the *Official Analytical Methods*. In 1959 he received the A. E. Bailey Award given annually by the North Central Section.

In addition to his work on the Fat Analysis Committee, Mehlenbacher has served on many other committees of the Society, both technical and administrative. He served in various capacities on the Governing Board for eight years and was president of the Society during 1949-50.

Mehlenbacher has been associated with Swift and Company during his entire professional career. He was chief chemist for 12 years, and is now head of the Product Assurance Department.

The Monday evening cocktail hour at the Gold Room of the hotel, an auspicious beginning for the convention, was attended by almost all of the registered members and guests. This "hour" has become the traditional time for oil chemists to greet old friends and to meet new members and visitors. The arrangements and refreshments were furnished by the Distillation Industries and Eastman Chemical Products, Inc. Afterwards many chemists went out to enjoy the restaurants and theatres of Chicago, although a substantial minority remained for committee meetings and serious activities such as last minute rehearsal of lectures.

On Tuesday morning the Girdler Process Equipment Division of Chemetron entertained a large gathering with a Kentucky breakfast party. Real Kentucky ham, with red eye gravy to enhance the grits, was the feature of the meal. After the breakfast John Slaughter, Jr., president of Girdler, presented the Society's president, A. R. Baldwin, with a commission making him a Kentucky Colonel.



V. C. Mehlenbacher



CHICAGO GENERAL COMMITTEE—(top row) C. W. Hoerr, Advisory; D. P. Arndsten, Exhibits. (second row) W. C. Pritchett, Program; D. B. Campbell, Jr., Entertainment; G. J. Stockmann, Advisory. (third row) R. J. VanderWal, Publicity; A. V. Graci, Jr., Hotel; A. F. Kapecki, Publicity. (fourth row) A. A. Rodeghier, General Chairman, Not present; N. W. Ziels, Treasurer; A. J. Schude, Registration; H. C. Black, Advisory; S. S. Fein, Advisory.



President A. R. Baldwin holds his commission as a Kentucky Colonel. It was presented by John E. Slaughter, Jr., with the aid of a Kentucky belle, after the Girdler Process Equipment breakfast at the A.O.C.S. Chicago Convention October 30th.



**LADIES' COMMITTEE**—Mrs. A. F. Kapecki, Mrs. R. J. VanderWal, Miss Cecilia Gilmore, Miss Mary Harmeson, chairman. Mrs. A. A. Rodeghier, Mrs. W. R. Prosch.

The ladies began their program of entertainment at 9 a.m. Monday by taking a chartered bus to Dundee for a visit to the Haeger Pottery plant. They afterwards lunched at The Evergreens.

Tuesday they visited the Patricia Stevens Salon and had lunch at the unique Kungsholm Restaurant. On Wednesday they were shown the laboratory and facilities of Chicago's Law Enforcement Agency, followed by lunch in the hotel's Belmont Room.



**LADIES' LUNCHEON**—After an interesting visit to Chicago's Law Enforcement Agency the ladies lunch together in the Belmont Room. (center front) Mary Harmeson, chairman.

## Chicago Program Diversified

ALTHOUGH it broke no records for total number of papers, the technical program of the 35th Fall Meeting in Chicago October 30, 31 and November 1 presented a wide variety of papers illustrating the diversity of activities in the fat and oil industry. That about one-third fewer papers were presented at this meeting than at the last two Chicago conventions might be explained by the fact that at the Spring Meeting in St. Louis there were almost twice as many technical papers as had been presented at any previous Spring Meeting. Despite the fact that fewer papers than usual were presented, the total attendance at the recent Chicago Meeting was very little less than the record registrations of the 1956 and 1958 Fall conventions.

With fewer papers, it was possible to schedule a minimum of concurrent sessions, so that more people were able to hear a greater percentage of the papers. Consequently, most of the technical sessions appeared to be far better attended than in the past.

It is of interest to note that of the 51 papers presented, 31% were given by members of nine academic institutions. Another 42% came from government laboratories. Of these, all were from units of the four regional branches of the U. S. Department of Agriculture, except for one from the Aberdeen Proving Grounds and one from a research unit of the Canadian Department of Agriculture. Only 27% of the papers were reported by representatives of industrial or commercial laboratories.

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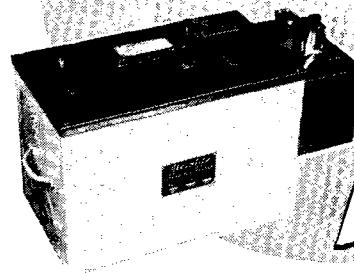
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**OPENING TECHNICAL SESSION**—N. V. Lovegren, S. G. Sourelis, R. B. R. Choudhury, Marcus Sittenfield, W. C. Pritchett—presiding.

The opening session, with W. C. Pritchett presiding, consisted of a series of papers which related chiefly to processing of fats and oils. N. V. Lovegren reported a method whereby certain fats can be converted to their stable polymorphic forms in the solid state merely by mechanical extrusion under pressure. This procedure was found to be effective in promoting crystalline transformations in certain cocoa butter-like fats which were not so readily converted to their more stable forms by conventional methods. Evidence of the desired transformation was obtained from x-ray diffraction patterns. M. Sittenfield reported on the extraction of flaked soybeans with a series of isomeric pentanes and hexanes. It was interesting to note that the various solvents resulted in very little difference in the quality or fatty acid composition of the extracted oils. R. B. R. Choudhury presented two papers differing markedly in their areas of interest. The first reported on the extraction of flaked soybeans with various concentrations of aqueous ethanol to study the effect of the solvent on factors relating to processing and on the quality of the resulting products. His other paper reported that, in order to obtain uniform products during the sulfonation process, some kind of diluent such as water or other solvent is required. S. Chourelis described a continuous one-step procedure for refining and water-washing crude coconut oil. It appeared that this process might well be applied to the treatment of other oils.



**BIOCHEMISTRY & NUTRITION**—(standing) Robert W. Lehman, Thomas McGuire, Carter Litchfield, S. Hashim. (seated) N. R. DiLuzio, J. J. Peifer, Eldon E. Rice—presiding, and Hans Kaunitz.

The afternoon session on Biochemistry and Nutrition, presided over by E. E. Rice, included reports of work on widely differing factors relating to the metabolism of lipids. It is of pertinent significance to note that some of our more sophisticated analytical techniques have been developed during the course of biochemical investigations. This session was no exception, for several papers reported studies involving several newer techniques which will certainly become increasingly useful in the analysis of fats and oils. One of these recent innovations is thin-layer

chromatography. J. J. Peifer discussed detailed procedures for preparing various types of microchromoplates which have been used in the analysis of tissue lipids and bile acids. The further extension and improvement of vapor-phase chromatographic techniques was illustrated by C. Litchfield in reporting the separation of four closely related geometric isomers of methyl linoleate by means of a 200-foot capillary column.

Among the biochemical studies, N. R. Di Luzio reported on the function of the reticulo-endothelial system in regulating the concentration of liver triglycerides. These studies indicated that the reticulo-endothelial cells might play an active role in other areas of lipid metabolism. S. A. Hashim discussed an apparently effective method of lowering serum cholesterol by cholestyramine-induced sequestration of bile acids. H. Kaunitz reported experiments which suggest that feeding of oxidative fat polymers might give some protection against x-irradiation damage. In another paper, Kaunitz discussed work which indicated that the feeding of long-chain triglycerides or of oxidized fatty material increased the tocopherol requirements of rats. In another report by J. J. Peifer, it was found much more practical, and fully as effective, to obtain the beneficial dietary effects of marine oils by feeding whole fish meals instead of only the marine oils derived therefrom. T. McGuine reviewed the recent intensive search by the fatty acid industry for the elusive "chick edema factor." Much of this information has been discussed privately for some time but had not previously been disclosed publicly. R. W. Lehman compared several different vitamin A assay methods currently in use and discussed the results which might be expected in analyzing various types of commercial vitamin A used in fortifying margarine.



**ANALYTICAL METHODS**—(standing) R. Buswell—presiding, Glen Jacobson, James W. Ryder, W. D. Pohle, (seated) Ralph Conlon, Ronald Binder, C. D. Evans.

As might have been expected, the session on Analytical Methods, with R. J. Buswell as chairman, was almost completely dominated by papers based on various chromatographic techniques. Three papers which failed to mention chromatography managed to find their way into the session. Of these, one presented by R. D. Conlon described a simple, rapid, and direct application of coulometry to the determination of organic acids in a non-aqueous medium. Acid values and free fatty acids in fatty materials have been measured by this method. W. D. Pohle compared the results obtained by three of the current methods of predicting the oxidative stability of fats and oils. It was found that the active oxygen method is not so precise as either the Eekey oxygen absorption or ASTM oxygen bomb methods. G. A. Jacobson reported on the application and limitations of a modified thiobarbituric acid reaction for determining certain components of oxidized fats.

All the other papers in this session referred in one way or another to the application of some type of chromatography. J. W. Ryder discussed the analysis of non-volatile materials in refined hexane by separation of the residues by paper chromatography and identification of the components by ultraviolet spectrophotometry. This solvent was considered to be suitable for the extraction of foods since no known carcinogenic materials were found in the



**CHEMICAL REACTIONS AND DERIVATIVES**—(standing) N. O. V. Sonntag—presiding, George R. Riser, James K. Weil, E. Jack Kahler, Eugene Miller. (seated) Abner Eisner, J. L. O'Donnell, Arthur Schwab, R. A. Eisenhauer, J. P. Friedrich.



**FAT COMPOSITION**—(standing) J. C. Cowan—presiding, William E. Scott, Orville Privett, H. J. Dutton, Richard Hoffmann. (seated) Mary McKillican, C. D. Evans, B. D. Mookherjee, Edward Selke, Marvin O. Bagby.

residues. Many of the principles of adsorption were utilized in the separation and characterization of alkyl benzene sulfonates outlined in the paper presented by M. E. Tuvell. By varying the composition of the solvent to control the effectiveness of the van der Waal's forces and the rate of elution, it was possible to obtain good separation of the component homologous and isomeric sulfonates according to differences in structure and molecular weight. Further progress in the determination of double-bond structure was reported by O. S. Privett who described an improved procedure for ozonizing the double bonds, catalytically reducing the ozonides, and analyzing the aldehyde fragments by gas-liquid chromatography. C. D. Evans presented two papers, one reporting the separation of mono-, di-, and triglycerides by utilizing a single-solvent system in a silicic acid column, and the other describing a method for identifying the components of a given homologous series by means of a semilogarithmic plot of elution volumes. R. G. Binder reported the fatty acid compositions of a number of domestic and foreign castor oils as determined by consecutive column and gas chromatographic analyses.

Held concurrently with the analytical session was the program of papers on Chemical Reactions and Derivatives under the chairmanship of N. O. V. Sonntag. In a report on the reaction variables involved in the preparation of dialkyl alpha-sulfofatty acid esters, E. J. Miller discussed the addition of lower olefins to alpha-sulfofatty acids in the presence of boron trifluoride. The preparation of a series of diesters and sulfonic acid monoesters of alpha-sulfopalmitic and alpha-sulfostearic acids was reported by J. K. Weil. Further studies on methanesulfonic acid catalyzed reactions were discussed by A. Eisner. Chromatographic separations and infrared analyses were utilized in characterizing the two types of products obtained through the addition of phenols to olefins. G. R. Riser reported on the stabilizing properties of various components extracted from *Vernonia anthelmintica* seed when used in plasticized sheets of polyvinyl chloride.

The other papers presented at this session all related to some aspect of the drying-oil properties of linseed oil. E. J. Kahler reported an infrared study of the changes of certain functional groups during the drying of linseed oil at elevated temperatures. R. A. Eisenhauer discussed the effect of ethylene on the yields of cyclic acids obtained by alkali treatment of linseed oil and linoleic acid at elevated temperatures, and J. P. Friedrich reported on a survey of catalysts and reaction conditions for increasing the yields of such cyclic acids. J. L. O'Donnell reported the preparation and properties of various types of emulsifiers developed for stabilizing linseed oil emulsion paints, and A. W. Schwab discussed some of the factors affecting the stability of such paints containing zinc oxide.

The session on Fat Compositions, presided over by J. C. Cowan, consisted of a series of papers based largely on the application of a wide variety of analytical techniques. The age-old myth that *trans* double bonds do not occur in nature was dispelled further by the finding of another *trans* isomer in a vegetable seed. M. O. Bagby

presented a detailed study of *trans*-5, *cis*-9, *cis*-12-octadecatrienoic acid isolated from the oil in *Thalictrum polycarpum* seed. It was suggested that similar acids might well be present in other vegetable seed oils. W. E. Scott reported that an enzyme system possessing lipase activity has been discovered in the seed of *Vernonia anthelmintica*. Studies in progress relate to the control of the lipase activity and to its specificity in the hydrolysis of glycerides.

Mary E. McKillican reported on the variation of the relative proportions of different lipid classes during the maturing of both flax and safflower seeds. This study involved an extensive combination of gas-liquid, paper, column, and thin-layer chromatographic techniques. O. S. Privett proposed a new theory of the mechanism responsible for the initial stages of autoxidation on the basis of ultraviolet spectrophotometry of the oxygen absorption of a series of unsaturated methyl esters. Further studies of the components of reverted soybean oil were discussed by B. D. Mookherjee in presenting work on the characterization of various carbonyl compounds isolated by adsorption chromatography. Studies of a similar nature were reported by C. D. Evans, who discussed the finding of other oxygenated and non-oxygenated decomposition products in autoxidized soybean oils by means of vapor-phase chromatography. R. L. Hoffmann reported the investigation of unsaponifiables extracted from refined soybean oils and separated by combined liquid-liquid, gas-liquid, and thin-layer chromatographic techniques. Continued usefulness of the multiple-transfer countercurrent distribution procedure was evidenced by E. Selke in his report on the wide variety of isomeric dienes and monoenes separated from partially hydrogenated linoleic acid. Such reports continue to confirm that a multiplicity of isomers is formed during the hydrogenation of fats. Another paper by Selke discussed the applicability of combined mass spectrometry and gas chromatographic techniques in determining double-bond positions. It is the use of advanced tools such as these that will most likely bring about future progress in our basic knowledge of fats and oils.



**DETERGENTS**—(standing) A. Mankowich, Alex J. Stirton, Martin J. Schick, L. Cohen, John Monick, J. O. Sherrill. (seated) A. C. Zettlemyer, Eric Jungermann—presiding, Albert R. Martin, H. B. Klevens.

The session on Detergents, with E. Jungerman as chairman, indicated that continued interest exists in this area on the part of a broad segment of the Society. The mechanism of soil removal and the physical structure of micellar agglomerates in the surfactant solutions still command considerable attention. Two papers presented by A. R. Martin related to principles involved in soil removal. In deriving a simplified form of the Kubelka-Munk equation which relates the amount of soil to the light reflectance of a fabric it was found that, when detergents are used in insufficient quantity to insure good soil removal, it is possible under certain conditions that the wash bath actually becomes a soiling bath and serves to fix the soil on the fabric. In his other paper which related to studies of the mechanical action of washing machines, Martin concluded that such action might be a major factor in promoting the redeposition of soil on fibers if the wash bath is not capable of holding in suspension all the soil it removes. A. M. Mankowich reported on the removal of three different kinds of soiling agents from metal surfaces by a variety of anionic and cationic detergents. It was found that there was no general correlation between maximum detergency and critical micelle formation. The apparent mechanism of soil removal depended on the given detergent-soil system. In some cases, soil removal seemed to be due to a displacement action caused by preferential wetting of the metal. In other cases, it appeared to be effected by solubilization or emulsification of the soil particles.

Among the reports on micelle formation and behavior, I. Cohen discussed the phenomenon of coacervation in aqueous cationic soap solutions on the basis of the light-scattering, viscosity, and diffusion properties of a number of these systems. In theorizing on the role of water in micelle formation, H. B. Kleven proposed a possible structure of the water molecules in the vicinity of the ionic atmosphere of the micelle. M. J. Schiek reported the effect of electrolytes on the micelle properties of nonionic detergents. By postulating that the solubility of such detergents

is a function of the hydration of their ethylene oxide chains, it was deduced that added electrolytes dehydrate the chains, thereby promoting aggregation and enhancing micelle formation.

A paper submitted by R. D. Vold reported the results of conductimetric and potentiometric measurements of the reactions between zinc salts and various surfactant solutions. This investigation was undertaken as a step toward understanding the effect of zinc oxide on the stability of emulsion paint systems. A. J. Stirton reported on the wetting, lime-soap dispersion, and related properties of an extensive series of sodium salts of alkyl esters of alpha-sulfofatty acids. It was found that the various physical properties were a function of molecular structure as well as molecular weight. A. C. Zettlemoyer discussed the adsorption of calcium ions to surfactant films on graphitized carbon black in the light of radiocalcium adsorption measurements. In the final paper of the session and of the meeting, J. A. Monick described a method for the continuous processing of alkylol amides.

Thus, it can be seen that much ground was covered during the 35th Fall Meeting. One major area of activity which seems to have been slighted is the field of tall oil processing. Other areas received only casual attention. It is such oversights that the National Program and Planning Committee is striving to correct and avoid in the future.

At any rate, it is evident that progress is being made in many directions. We are gradually finding out more about the metabolism and nutritional aspects of fats and oils. Our analytical techniques are becoming more precise, more widely applied, and more sophisticated. Processing methods are being progressively converted to more continuous procedures governed by more complicated automatic control systems.

Yet there are gaps in our progress. For example, despite the recent enthusiasm over the introduction of enzymatic hydrolysis, there were no papers at this meeting reporting

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