



GOVERNING BOARD—Assembled for their first meeting, at the close of the New Orleans program, May 6, are the following officers: T. H. Hopper, A. E. Bailey, Procter Thomson, C. E. Morris, W. A. Peterson, and A. F. Kapecki; (standing) H. C. Black, V. C. Mehlenbacher, J. C. Konen, and E. M. James. Absent because of another meeting is J. R. Mays Jr.

Mix Business and Pleasure at New Orleans Meeting in May

BUSINESS and pleasure were agreeably mixed at the 44th Annual Meeting of the American Oil Chemists' Society held May 4, 5, and 6, 1953, at the Roosevelt hotel, New Orleans, La. Renewal of acquaintances, shop-talk, committee meetings, presentation of technical papers, and social festivities kept the convention a beehive of activity for three days.

The meeting was convened by convention chairman J. A. Kime on Monday morning. Reports of the standing committees were presented. President E. M. James addressed the meeting and reviewed the past year's activity and achievements. Recognition of A.O.C.S. members who had died since the last meeting caused the meeting to pause in silent tribute to their contribution to the Society during their membership. A. R. Baldwin reported on the monumental task of indexing all the Journal's articles since its inception. Procter Thomson, in his report, as Membership Committee chairman, stated that he was confident that the recent by-laws amendment to establish local sections of the Society would augment the membership. The reports of the secretary and treasurer reflected the sound condition of the Society. The long, faithful work of J. J. Voltertsen, who retired as treasurer, was recognized by a standing ovation. Two charter members, T. C. Law and G. Worthen Agee, attended the convention and were similarly recognized. Paul Cretien joined a select group by winning the Smalley cup for the third consecutive year.

Several of the technical committees met at the convention. Among them were the Uniform Methods, Refining, Color, and Spectroscopy.

DETAILED reports of each committee will be published at a later date, but salient points are mentioned herein. In the report prepared by the Uniform Methods Committee and given by Chairman J. T. R. Andrews recommendations of the Fat Analysis, Soap Analysis, Soapstock Analysis, and Spectroscopy committees were approved by the convention. Official Method Ce 11-53, cold test for winter oils, was approved. This method was rewritten and approved at the Cincinnati meeting but was not included in the committee report at that time. Tentative Method Ja 5-53 was approved. This is a new method for phosphorus determination in lecithin. The Fat Analysis subcommittee recommended the adoption of Tentative Method Ca 6b-53 to replace Official Method Ca 6b-40. It was the opinion of the group that the tentative method should be used for the determination of unsaponifiable matter in soapstock. This method is considered more satisfactory than the older Kerr-Sorber method. A new method, Tentative Method Da 30-53, was recommended for determination of trace amounts of copper contamination in soap and soap products. This method utilizes spectrophotometric analysis of the dithizone-copper complex. Tentative Method G 3-53 was approved to replace Official Method G 3-39. This is a method for oxidized fatty acids, which may be defined as that material obtained by the wet extraction method which is insoluble in cold petroleum ether but is soluble in ethyl ether. The proposed procedure is identical with Method G 3-39 for Total Fatty Acids, with an added provision for ethyl ether extraction. This method, recommended by the Soapstock Analysis Committee, was approved by the Uniform Methods Committee and was recommended by them for adoption as tentative.

The Uniform Methods Committee requested the Soapstock Analysis Committee to investigate a discrepancy between N.C.P.A. Rule 276, Secs. 2 and 3, and A.O.C.S. Methods G 2-39, G 3-39 (or G 3-53, if adopted). The difference between the Rules and the A.O.C.S. Methods is in the treatment of the paper used for filtering the petroleum ether extracts. Rules require a dry extraction of the filter paper; A.O.C.S. Methods prescribe washing thoroughly with petroleum ether. If the latter is found to suffice, a more complete specification of the washing technique is indicated. A caution concerning the amount of insoluble impurities to be brought upon the filter paper may be desirable as this may influence the completeness of fatty acids removal by washing. The Soapstock Analysis Committee was further requested to draw up a procedure for preparation of Total Fatty Acids for the Iodine Value Determination.

The A.O.C.S. supply of activated bleaching earth was reported as having been renewed by procurement of 2,000 four-pound cans and has been approved for distribution. Two thousand cans of official natural bleaching earth are still in stock. Eight thousand more cans have been prepared for future needs. The earth has been tested and is of uniform quality. The expiration date of the existing supply will be extended to July 31, 1954, at which time it is expected that the new supply will be distributed as the official earth. A fresh supply of 2,000 cans of Official Diatomaceous Earth has been contracted.

The Refining Committee met and heard a report from the subcommittee on investigation of Possible Refining Method for Cottonseed Oil Extracted from Pre-Pressed Cake. Due to nonuniformity of the oil no feasible method for refining loss could be adopted for solvent extracted oil from prepressed seed. The special subcommittee was disbanded.

The Color Committee completed plans for work on competitive samples for the coming year.

The Spectroscopy Committee has outlined an extensive program. They have planned work on the collection of data on mono-unsaturates in the infrared region. Particular attention will be paid to trans-configuration in cis-trans mixtures.

A number of varied and interesting papers were presented. T. H. Hopper organized the technical sessions, in which 28 papers were given. Many of the papers dealt with current investigations of vegetable oil constituents and with methods of analysis. Other papers about oil flavor stabilization and the effects of various process conditions on product composition and quality were presented.

Two papers were given on the effect of various oxygen-coordinating compounds as trace metal scavengers. A number of investigations have been conducted. It was pointed out that the metal chelation activity in edible oils increases with the number of free acid groups. No compound was found to be effective which had no free acid groups. Of the chelating agents tested, citric acid seemed to be the best. However another material that had been used and showed more promise



MONDAY SPEAKERS—Facing their chairman, Procter Thomson, from left to right are H. J. Dutton, W. S. Singleton, Cyril Evans, Rex J. Sims, R. O. Simmons, O. S. Privett, and F. R. Senti.



TUESDAY MORNING SPEAKERS—To the left of the presiding officer, F. G. Dollear, are R. F. Paschke, L. R. Dugan, and W. G. Bickford. At the extreme right is F. E. Luddy.



WEDNESDAY SPEAKERS—Lined up on the platform in the ballroom of the Roosevelt hotel in New Orleans are W. H. Hunt, Duncan Macmillan, Ralph Planck, D. S. Bolley, E. A. Gastrock (chairman), F. A. Kummerow, H. L. E. Vix, S. T. Bauer.

than citric acid was carboxymethylmercapto succinic acid. Although it can be decomposed during deodorization, imparting a slight sulfur odor to the oils, the order was not carried into the cooked foods. It was recommended that this compound be added towards the end of the deodorization process. The stabilizing effect of this compound on edible oils in the presence of iron and copper was demonstrated by the oxidative and organoleptic results obtained. It was felt that the material is a metal chelating agent, but there is no direct evidence or substantiation.

Investigations on fatty acid formation in growing soybeans were discussed. Evidence was presented to show the order of preference in which these acids are found. Excised soybean stems, bearing pods and leaves, were supplied with radio-active sucrose. The fatty acids were separated chromatographically and their specific activity measured. Radioactivity appeared in oleic, saturated, linoleic, and linolenic, in that order. Because of the consistently high specific activity in the oleic acid, it was assumed that oleic acid may be converted to other acids to some extent.

Verification of the isomeric configuration of alpha- and beta-oleostearic acid by infrared spectroscopy indicate the usefulness of this information in varnish and paint formulation. This information may also be applied to the manufacture of plastic.

Dilatometric analysis of some of the octadecenoic fatty acids showed that the melting dilation of the trans isomers was greater than the cis form. It was predicted that hydrogenated glycerides containing trans isomers of oleic acid would be more dense than similar glycerides containing normal oleic acid.

Another paper was given on the formation of trans isomers during hydrogenation. It was brought out that conditions favoring selective hydrogenation also favor the development of trans isomers. An inverse relationship exists between hydrogen pressure and the percentage of developed trans isomers, which can be measured by infrared absorption. Trans isomerization is promoted by elevated temperature, decreased agitation, and low catalyst concentration. Palladium at 40°C. was found to be as selective as reduced nickel at 200°C. Platinum was found to be very non-selective. During hydrogenation the trans isomer content increases to a maximum and then decreases to zero as the fat approaches complete hydrogenation. For hydrogenated soybean oil the trans isomer content varied from 14% to 72% at the maximum point and was dependent upon the selectivity conditions. In general, the higher the initial iodine value of an oil, the greater the percentage of trans isomers formed.

HERBERT J. DUTTON, Northern Regional Research Laboratory, discussed the preparation of the "Global Edible Spread." Because domestic margarine is quite hard when cold and very soft at warm temperatures, the Quartermaster Corps has been very interested in a spread with a wide plastic range. Logistical problems are too complicated to allow particular margarine formulations to be dictated by climatic conditions. A need for a universal product that would be suitable for any place in the world was indicated; hence the name "Global Spread." The first attempts to prepare this product were made analogous to the development of lubricating greases, soybean oil plus calcium soap. Good spreadability was obtained, but poor flavor, poor stability, and indigestibility prevented its acceptance. A blend of vegetable oils, monostearate, butter flavor, coloring, salt, antioxidants, and oil-soluble vitamins gave good results. Since the product contains no moisture, there is less trouble with spoilage or weeping. The "Global" margarine is spreadable from below freezing to in excess of 110°F. The consistency of the product can be controlled by the amount of saturated monoglyceride. Incorporation of nitrogen gives the spread a margarine-like characteristic. Unsaturated monoglycerides offered no advantage.

High speed centrifugation can be used to determine the solid-liquid ratio of a plastic fat. The liquid phase may be recovered in a pure form, but the solid phase will contain appreciable quantities of the liquid portion. By correcting for the liquid oil, it is possible to use this method for rapid estimation of the solid-liquid ratio. By centrifuging the fat with a layer of aqueous alcohol of intermediate density to the oil and solids, the solid phase may be separated more nearly oil-free. By this method the solid-liquid ratio estimation is approximately 2 to 2½ times as high as by dilatometric methods. The variation of 2 to 2½ is due to difference in types of crystalline structure.

Every scientific advance has followed an improvement in experimental technique. Liquid-liquid extraction is one of the oldest methods of experimental procedure, having been used in the preparation of perfumes since prehistoric times. Until recently however it was applied only to those things which are easily separated. With the development of better methods of procedure, it has been used for separation of lipid fractions. For this purpose it has many advantages, not the least of which are the mild conditions under which extraction is conducted as compared to other methods such as distillation. Until very recently the most efficient extractions consisted of the equivalent of 53 plates, but the new Craig extractor has made 400 plates available in a compact unit and, by recycling, this unit has been applied to problems involving a 3,000-plate extraction. Part of the experimental data included in this paper proved that soybean oil is not of even distribution, that it is possibly a borderline restricted configuration or possibly random distribution. This procedure should be very usable in pigment work, and the authors hope to see it applied to the study of cottonseed pigments. One additional advantage is complete recovery of all materials.

The phosphatide content of commercial lecithin is normally characterized as that fraction which is insoluble in acetone. At present the tentative method for arriving at this figure is to determine moisture, benzene insoluble, and acetone soluble and then subtract the total from 100. This is a time-consuming, indirect method which is subject to at least two known errors. One is solubilization by traces of residual petroleic ether, and the other is the slight but appreciable solubility of phosphatides in acetone. By eliminating the petroleic ether and using phosphatide saturated acetone for washing, in a direct method where the acetone insoluble is weighed as such, more accurate determinations can be made in less time.

COLOR of oils can be accurately designated by trichromatic coefficients and brightness. These properties can be determined by transmission spectra of the oils. Chromaticity, which



KEY TO THE CITY—A. Brown Moore (left), representing Mayor de Lesseps S. Morrison, conferred honorary citizenship of New Orleans and a key to the city upon E. M. James, retiring president of the American Oil Chemists' Society, on May 4 at the Roosevelt hotel. Moore is commissioner of public utilities.

represents the hue and purity of a color, is not a sufficient definition of color. However neither is the existing Lovibond system satisfactory. For example, a group of oils arranged in order of their brightness will, when inspected, have a logical order of appearance. That is, the darkest oil from a standpoint of brightness will also be the darkest in appearance. A series of oils arranged according to Lovibond colors, as determined in the Wesson Tintometer, may not be at all logical in appearance. It is suggested that brightness may be effectively determined by a single reading of transmission at a proper wave-length, in an instrument such as the Coleman Jr. Spectrophotometer.

A new cause of blue-colored lard has been discovered. The color is due to a photoactivation effect on lard contaminated with iron and treated with a combination of antioxidant ingredients. Lecithin and iron in the presence of butylated hydroxyanisole, propyl gallate, and citric acid were found to be responsible for the production of the photoactivated color. The blue-black color was not noticed in lards in the absence of lecithin.

Information relative to the factors affecting the stability of peanut crude oil was presented. The relation between fatty acid composition, tocopherol and autoxidative stabilities of 16 samples of crude oil derived from three types of peanuts were investigated. Of the three types, Spanish, Virginia, and Runner, the Spanish variety had the highest linoleic acid content while the Runner species had the lowest. The reverse was found to be true regarding oleic acid content. Of the four known tocopherols only alpha- and gamma-tocopherols were found to be present. There is some evidence that crude peanut oil contains a non-tocopherol antioxidant or synergist.

Tall oil, which is a by-product of sulfate pulp manufacture, is becoming important in the paint drier field. This subject was treated thoroughly, and various production problems were emphasized.

Considerable interest has been shown in alga chlorella. Because of the rapid increase in world population and the alarming rate of top soil erosion, plants not dependent upon soil are being studied. Chlorella is a single cell microscopic plant and is a member of the green algae family. It is a nutritious food for both man and animal. The protein content is increased and the lipid content decreased by increasing the nitrogen content of the growing medium. The lipid portion has been analyzed, and the fatty acids have been determined as C16 and C18.

Conditioning, rolling, cooking, and procedure for screw press operation can greatly affect the quality of cottonseed oil and meal produced in mechanical presses. In general, so far, it appears that cooking at higher moistures and temperatures



NEW ORLEANS COMMITTEE—Some of the key people behind the 44th annual meeting are shown above: (seated) J. J. Ganuchau, Mrs. C. H. Fisher, J. A. Kime, T. H. Hopper; (standing) W. S. Singleton, C. L. Hoffpauir, A. F. Freeman, R. M. Persell, and E. A. Gastrock.

than are currently used, followed by evaporative cooling and conditioning, results in better quality crude oil, approaching hydraulic characteristics, with slightly improved meal. Cooking at lower temperatures and moistures than are currently used resulted in greatly improved meal but was detrimental to oil quality. Both of the modifications resulted in reduced capacity through expellers. Obviously, the ideal operating procedure would be one which would combine the advantages of the two new techniques without sacrificing capacity. This work is of great interest since the relative quality of expeller cottonseed oils and meals becomes of greater importance as more and more mills convert to expeller operation for reasons of economy.

A series of publications have dealt with a new concept of solvent extraction perfected at the Southern Regional Research Laboratory of the U.S.D.A. This new extraction scheme, called Filtration-Extraction, is claimed to have a number of advantages over existing methods. It has now been applied successfully in pilot plant scale to soybeans. This paper will be of interest particularly to those mills who may have the problem of processing cottonseed and soybeans interchangeably.

A survey of the colleges and universities which offer training in fat and oil technology was compiled and presented to the convention by F. A. Kummerow of the University of Illinois. Of the 39 institutions contacted, 12 schools offer some training in this field, and five schools have established comprehensive programs. All of the five universities' curricula are sufficient for a major in fats and oils, with additional graduate work. These schools are: Ohio State University, Purdue University, University of Illinois, University of Minnesota, and University of Wisconsin.

At the final business session of the convention Retiring President E. M. James presented the traditional Indian hammer gavel to the new president, Procter Thomson. Officers who were installed by Mr. Thomson were: C. E. Morris, vice president; T. H. Hopper, secretary; A. F. Kapecki, treasurer; and Governing Board members-at-large H. C. Black, J. C. Konen, and W. A. Peterson. The president entertained a motion for adjournment, and the 44th meeting ended on a note of enthusiasm and attainment of purpose.

WALES NEWBY
R. J. BELL

Meetings

Eight technical symposiums and many other technical papers on a wide range of subjects in the field of engineering materials are on the program of the 56th annual meeting of the American Society for Testing Materials at Chalfonte-Haddon hall, Atlantic City, N. J., June 28-July 3, 1953.

The 33rd annual convention of the American Soybean Association will be held at the Jefferson hotel in St. Louis, August 20-21. There will be four half-day sessions, each on a general topic such as marketing, growing, new products.

The annual meeting of the National Society of Professional Engineers will be held in Daytona Beach, Fla., at the Sheraton-Beach hotel, June 18-20, 1953. The meeting will include the presentation of the NSPE award to Charles F. Kettering, vice president of General Motors.



REPORTERS—Teaming up to cover the New Orleans meeting for the Journal are Wales Newby (left), Cotton Products Company, Opelousas, La., and R. J. Bell, Mrs. Tucker's Foods Inc., Division of Anderson, Clayton and Company, Sherman, Tex.