**H. E. Carter (left) and R. C. Stillman chat as Mrs. Carter, Mrs. Stillman and Mrs. C. W. Hoerr listen.**

the 118 papers delivered. Thirty-two states were represented, as well as Canada, The Netherlands, British Columbia, Sweden, France, Japan, Germany, and Australia.

### Record Number of Exhibits

For all but a few exhibitors, no hardship was felt, since their equipment was quickly moved into the hotel just as soon as the strike appeared inevitable. However, several of the late arrivals had difficulties attempting to cross picket lines on Sunday. F. G. Shea, Exhibit Chairman, is to be congratulated not only for amassing the largest number of booths at any National AOCS Meeting, but also for conducting an outstanding exhibition.

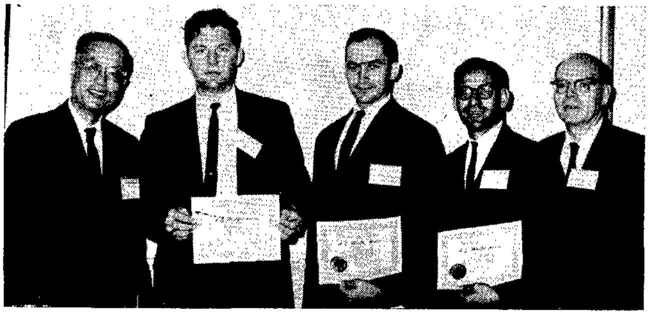
### Sunday Mixer in Colorful Surroundings

"Just for fancy," to borrow a Pennsylvania Dutch phrase, were the decorations at the opening mixer on Sunday evening. The brightly-colored "hex" signs, copied from those seen throughout the countryside, continue to baffle experts who have tried to trace their exact significance, but are usually thought to insure good luck. Not willing to rely on luck, Frank Scholnick and his assistants added work and service, and the evening was a grand success, in spite of the absence of regular hotel serving personnel.

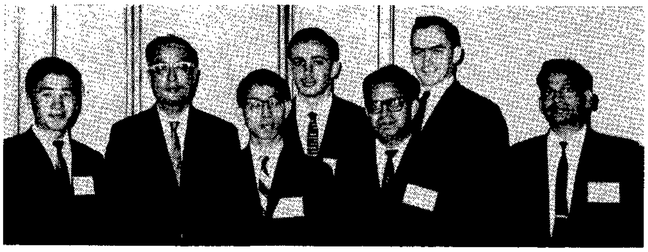
### A. N. Wrigley Opens Monday Session

A. N. Wrigley, General Chairman of the 40th Annual Meeting, presided over the opening session held in the Rose

(Continued on page 494A)



**Honor Student Program Chairman S. S. Chang with AOCS Honor Student Awardees R. E. Anderson, J. A. Thompson, B. J. Burns. At far right is N. H. Kuhrt, Chairman, Education Committee.**



**Rutgers students accompanying S. S. Chang. Left to right: S. S. Liu, S. S. Chang, Yoshiyuki Kawase, R. E. Deck, M. M. Paulose, J. A. Thompson, B. R. Reddy.**

# Arthur Rose Presents Award in Lipid Chemistry

*Following is the text of the Award Address made by Dr. Rose, of Applied Science Laboratories, at the AOCS Meeting in Philadelphia, October 4, 1966.*

This is the third time I have had the assignment and the pleasure of participating in the presentation of the AOCS Award in Lipid Chemistry that is sponsored and financed by Applied Science Laboratories, Inc.

I am very glad to be here with you for a number of reasons. Most of all, I am glad because the Award is going for the first time to a colleague I have known personally and worked with through the years. I positively know that Herbert E. Carter deserves the Lipid Award. It makes me glad I am a Chemist and a fellow Oil Chemist with Herbert and all of you, even though my official function is with the financial part of the Award. I am also glad to be here because this whole thing really started here in Philadelphia with your's and my distinguished colleague, Dr. Waldo Ault, of Philadelphia. I will tell you more about this in a succeeding paragraph. Finally, I am glad to be here because I have the unusual pleasure of giving you greetings from the Governor of Pennsylvania. An appointment with him almost kept me from being here. After I explained my situation, he said he was sorry not to be able to participate in our banquet, and said I must be sure to give you his greetings and best wishes for a good meeting.

Each time the circumstances and location of the presentation of this Award have seemed to me to have had a special significance. The first Award, in 1964 to Dr. Erich Baer of Toronto, was made at State College, Pennsylvania, the hometown of Applied Science and we were pleased to show our facilities to those who attended. The second Award, in 1965 to Dr. Ernst Klenk of Germany, was made in my own hometown of Cincinnati, Ohio, where I received all my professional training, and I was reminded of the "over the Rhine" district, where my father and mother lived before I was born, when they first came from Germany.

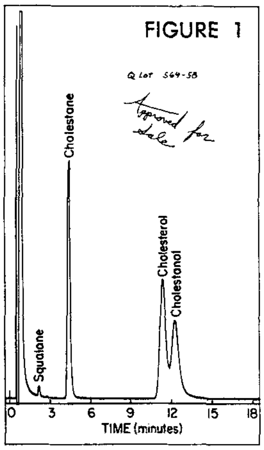
This year, again, I can trace the Lipid Award back to its beginning in connection with Philadelphia and Pennsylvania. The whole story really started with Dr. Waldo Ault. Applied Science Laboratories, Inc., as already mentioned, is a Pennsylvania Corporation, with its hometown in State College. The company was started in State College in 1951 while I was still a professor at the Pennsylvania State University. The objective of the company was to put to practical use some of the know-how of myself and other professors. Applied Science has managed to put some of this knowledge to practical use and one area of work started with preparation of high-purity fatty acids and esters. This led to work with more complex lipids and thus to the sponsorship and financing of the AOCS Award in Lipid Chemistry. But it was Dr. Waldo Ault, of the Eastern Regional Research Laboratory, who really started it all when he wrote to me in 1952 or 53 to find out if I would be interested in some fundamental research on fatty acids distillation. I replied in the affirmative and after we (includes Dr. Daniel Swern, H. B. Knight and others) did some talking and planning, I told him fatty acid work might well be a major interest for the remainder of my professional life. And so the links in the chain are Philadelphia and Waldo Ault, to Arthur Rose to fatty acid distillation to Applied Science to lipids and the AOCS Lipid Award to this presentation in Philadelphia.

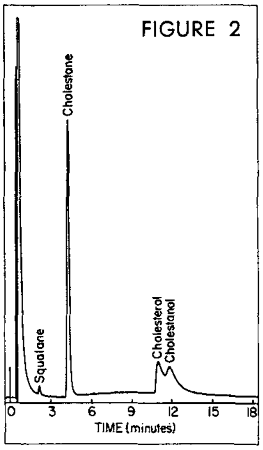
Last year I made a far-reaching prediction about the future of lipid chemistry and related fields. It is too soon to be concerned with a check-up on the prediction, and also too soon to make a further prediction. But certainly, lipid research is on the move. My own associates have put various new products on the market, and these are being consumed in increasing quantities by an increasing number of researchers. We find we must read more and more research papers. Lipid research is certainly active. Sometimes it seems that this is now the central and most

(Continued on page 517A)

# THE NEW GAS-CHROM SUPPORT

Q stands for GAS-CHROM Q, the new support for you — particularly if you are using gas chromatography for analysis of steroids, alkaloids, bile acids, pesticides, etc. GAS-CHROM Q is DMCS-treated specifically for such applications. NEED PROOF? Consider the difficult separation of cholesterol from cholestanol on a low-loaded QF-1 column, which is a good test of a support. It requires high efficiency and negligible tailing. Dehydration of cholesterol can occur if the support is not made just right. **Q is made just right** as shown in figure 1. Results for the same test mix on similar QF-1 columns made with other commercially available silane-treated supports are shown in figures 2 and 3. Note any difference? The test mix contains cholestane as a reference. A good thing, too. Wonder where the -erol and -anol went in figures 2 and 3? Look at the baseline after the cholestane peak.





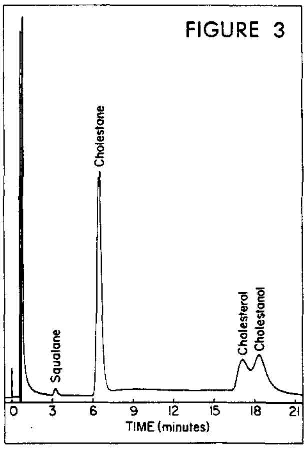


FIGURE 1. GAS-CHROM Q, 100/120 mesh, 7.9 grams of packing
FIGURE 2. Competitor A, 100/110 mesh, 7.8 grams of packing
FIGURE 3. Competitor B, 100/120 mesh high density white, 14.4 grams

All columns were 6 ft. x 4 mm ID glass U tubes run in a Barber Colman Model 5000 at 230° C. Packings consisted of 3% (or equivalent) of QF-1.

| **PRICES:** | Mesh | $/100 g |
|---|---|---|
| | 60/80 | 26.00 |
| | 80/100 | 30.00 |
| | 100/120 | 31.00 |

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**Session E, Symposium on Soap Bacteriostats. Left to right: Chairman Eric Jungermann, H. I. Maibach, D. M. Updegraf, D. Taber, L. J. Vinson, T. F. McNamara, J. Jerome.**

(Continued from page 492A)

Garden Room. C. W. Hoerr officially called the meeting to order, and Frank Naughton, Vice-President of the Northeast Section, delivered the welcoming address in the absence of M. K. Smith, President of the Northeast Section, who was unable to attend.

## Interim Report Given by Hoerr

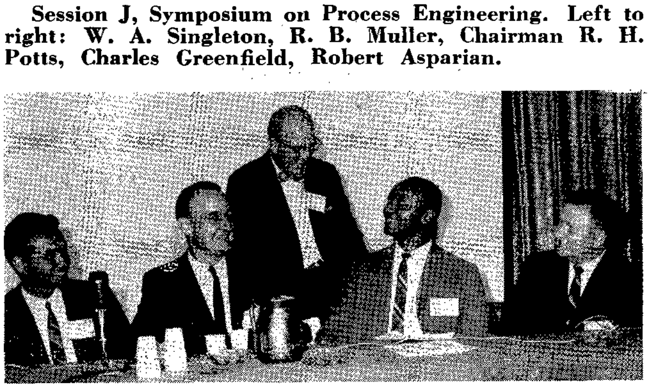
President Hoerr noted that the situation within the hotel had resulted in "minor variations" in the usual smooth proceedings of an AOCS meeting, but added that these did not in any way detract from the quality of the program prepared.

In his Interim Report, Mr. Hoerr observed that membership and revenue figures were increasing, but not to as great an extent as desired. Although the Society is operating "in the black," hopes to build reserves have not yet been realized. He expressed his satisfaction with the success of *Lipids,* launched Jan. 1, 1966. Circulation of this new journal will soon reach the 2,000 mark.

The two 1966 short courses, a TLC Course at Penn State and a Fats and Oils Processing Course at Michigan State University were noted as highly successful. Credit and thanks were given to those who contributed to these excellent sessions. A processing course similar to that held at Michigan State will be conducted in January in Monterrey, Mexico.

Of special interest is the change in the format and production of the membership directory, with the result that the cost is considerably decreased, and annual instead of biannual publication becomes possible. This arrangement is a welcome convenience to the entire membership.

**Session J, Symposium on Process Engineering. Left to right: W. A. Singleton, R. B. Muller, Chairman R. H. Potts, Charles Greenfield, Robert Asparian.**



**Session K, Detergents General. Left to right: D. O. Shah, J. K. Weil, J. F. Gerecht, F. D. Smith, R. G. Bistline, Jr.**

**Lipids Committee, clockwise: W. O. Lundberg, F. W. Quackenbush, George Rouser, Chairman A. R. Baldwin, Raymond Reiser, C. H. Hauber, R. M. Burton, F. T. Lindgren.**

The results of a recent meeting with Wilbur Claus, President of the American Association of Cereal Chemists, was also announced. Mr. Hoerr has been directed by the AOCS Governing Board to appoint representatives to a special committee which will discuss the possibility of a joint meeting with the AACC.

With regret, Mr. Hoerr announced the death earlier this year of J. J. Ganucheau of New Orleans, one of the Society's very few Honorary Members. R. T. O'Connor has been appointed to take Mr. Ganucheau's place as New Orleans Resident Representative, serving with H. L. E. Vix.

## Ernst Klenk Welcomed to Sessions

Ernst Klenk, winner of the second AOCS Bond Award in Lipid Chemistry in 1965, was introduced at this time. Dr. Klenk was unable to be present at the 1965 meeting in Cincinnati because of illness. His wife, Margarete Klenk, accompanied her husband to the Philadelphia meeting, charming her American hosts and evincing considerable interest in the Society. She warmly expressed her appreciation of the Award presented to her husband.

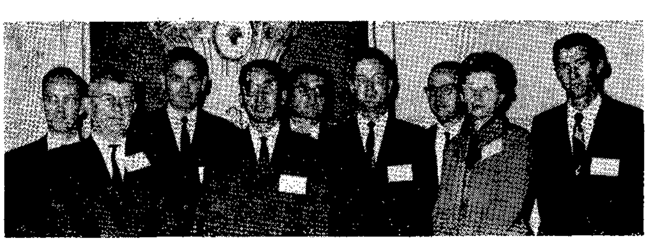
## Warner Receives Bond Award Gold Medal

T. W. Findley presented the Bond Award Gold Medal to D. T. Warner, the Upjohn Company, Kalamazoo, Mich. The award was presented for his excellent delivery of a paper entitled "Molecular Model Formulations of Protein Structure," given at the AOCS Spring Meeting in Los Angeles. Dr. Warner's acknowledgment was delivered in original verse, thereby adding a delightful innovation to the awards program. This poem will be printed in its entirety in the December JAOCS. It is a tribute returned, and it was warmly received.

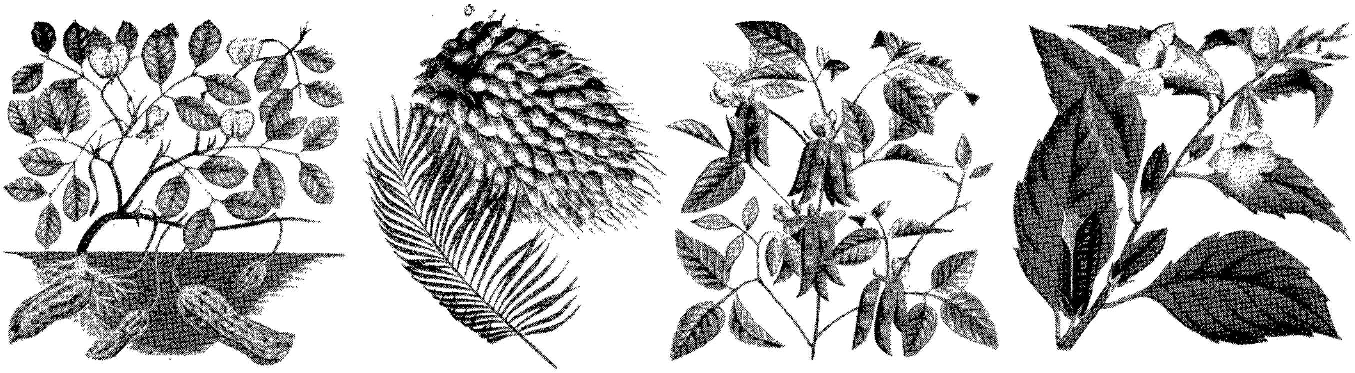
## S. S. Chang Presents MacGee Awards to Three Students

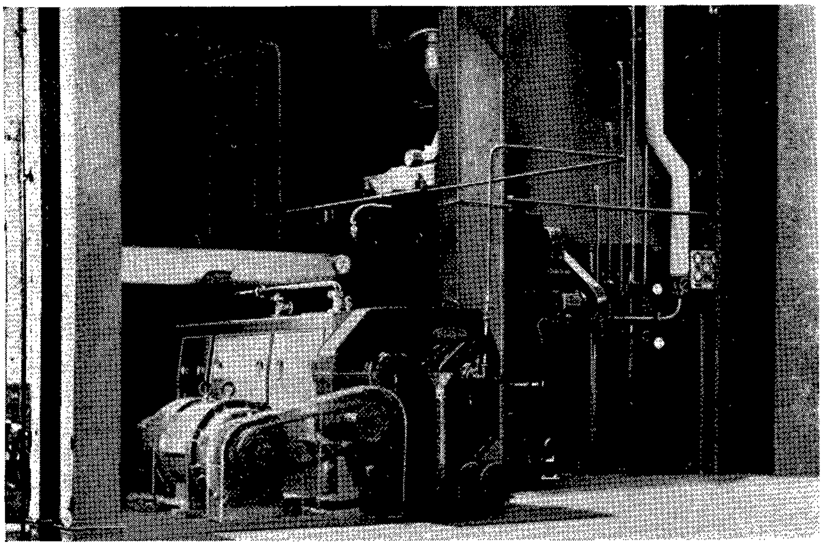
The MacGee Awards were presented by S. S. Chang of Rutgers University. The outstanding students named were: R. E. Anderson, J. A. Thompson and B. J. Burns. Mr. Anderson, PhD candidate from Texas A&M University, has been active in a research project entitled "Triglyceride and Phospholipid Structure of Fat from Animals Raised on a Completely Fat-Free Diet." In his PhD work at the State University of New York, Mr. Burns has been engaged in a study of the effect of lipogenesis by alteration in the lipid content of the diet of alloxan diabetic rats. The title of Mr. Thompson's investigations is "Chemical Characterization of the Thermal Oxidative Polymers of Fats and Oils."

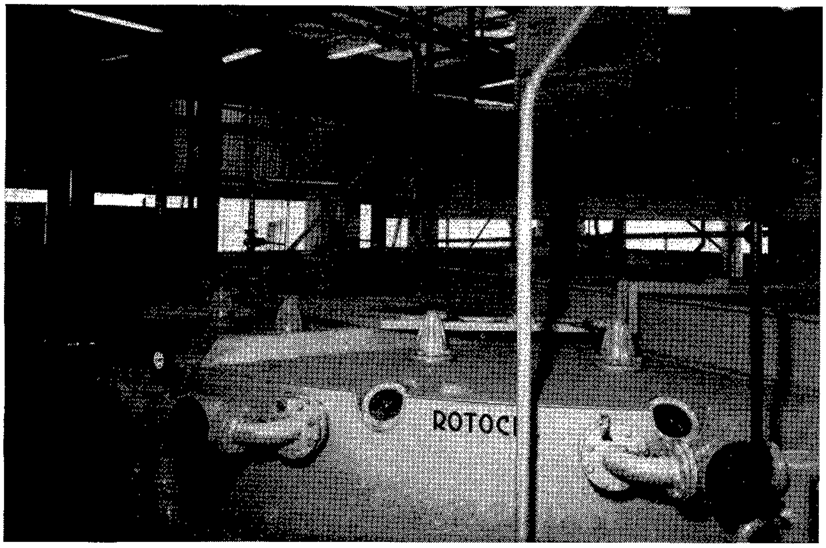
(Continued on page 516A)



**Session H, Detergent Evaluation Methods. Left to right: R. C. Taylor, George Hartwig, R. T. Hunter, H. Y. Lew, B. E. Gordon, N. L. Groves, Chairman T. H. Liddicoet, B. J. Rutkowski, R. E. Madden.**







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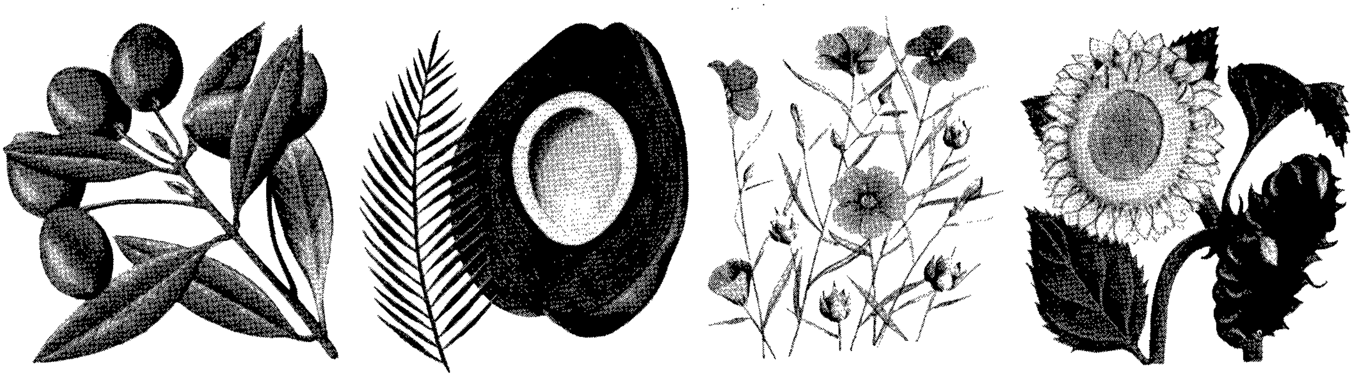

## Notable examples of recent contracts

IN AFGHANISTAN four complete cottonseed oil mills, with associated refineries and hardening plant, to produce refined oil and cooking fat. Capacity 300 tons per day of cottonseed.

IN NIGERIA a complete screw press mill in what is probably the world's largest palm kernel mill.

IN THE LEBANON a complete oil mill and refinery and hardening plant to produce cooking fat from cottonseed. Capacity 60 tons per day, extending to 180 tons per day.

IN PERU a complete oil mill and refinery producing refined oil from cottonseed. Capacity 40 tons per day.

IN HOLLAND a solvent extraction plant processing 150 tons of meat and bone greaves per 24 hours to produce animal fat and sterilised meat and bone meal.

IN THE UNITED KINGDOM a solvent extraction plant processing 250 tons per day of soya and other oilseeds to produce edible oils and feedstuffs.

IN TANZANIA a solvent extraction plant producing castor oil and fertilisers from castor seeds.

IN CHILE a pre-pressing installation of screw presses dealing with 200 tons a day of rapeseed.

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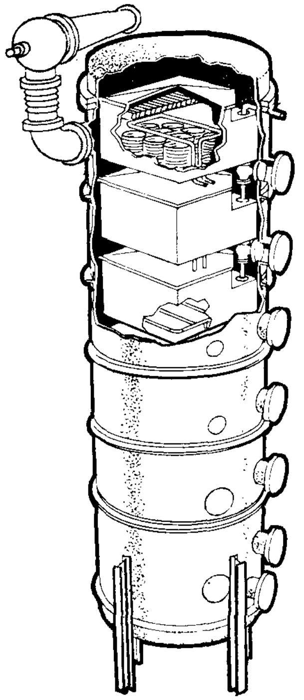
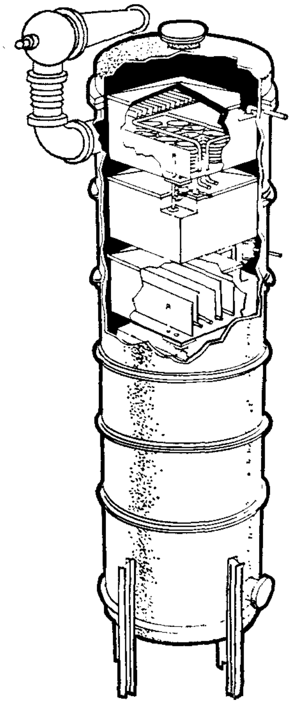


Semi-continuous deodoriser.



Fully-continuous deodoriser.

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# Symposium on Odors and Flavors Attracts 200 Chemists

The two-day symposium on odors and flavors which was held during the 40th Fall Meeting of the American Oil Chemists' Society in Philadelphia on October 2–5, 1966, has received numerous favorable comments. The symposium was organized by S. S. Chang of Rutgers, The State University and consisted of twelve papers contributed by four universities, three government laboratories, and four industrial laboratories.

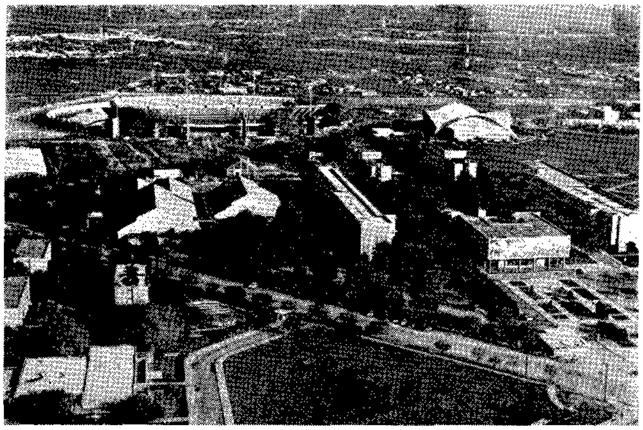
The first session of the symposium was chaired by Dr. Chang. It was opened by D. G. Moulton of Clark University who discussed the physiology of odor and flavor detection and by A. Dravnieks of Illinois Institute of Technology Research Institute who reported the recent advances in the measurement of odors and of odor components of flavors. Dr. Chang then described the methodology he and his associates developed for the isolation, fractionation, and identification of volatile flavor compounds in fats and oils. The recent development in the flavor stability of soybean oil was reported by J. C. Cowan of Northern Regional Research Laboratory. The identification of components responsible for the hydrogenation flavor and in the autoxidative products of methyl linoleate were then discussed by J. G. Keppler of the Unilever Research Laboratory and R. J. Horvat of the Western Regional Research Laboratory respectively.

The second session was also chaired by Dr. Chang. It was opened by E. H. Polak of the Polak Frutal Works, Inc., with a discussion of the methods for the industrial reconstitution of a flavor from the compounds identified by the procedures reported in the first session. The flavor chemistry of milk, cheese, meat, and potato chip was then reported by J. E. Kinsella of Pennsylvania State University, E. A. Day of International Flavors and Fragrances, Inc., I. Hornstein of ARS, USDA, and R. E. Deck of Rutgers, The State University, respectively. The symposium was concluded by H. P. Andrews of Rutgers, The State University, with a discussion of the application of statistics to sensory evaluation research.

This symposium was so successful and well received that a similar symposium is being planned for the 1968 Fall Meeting in New York City.

◆

## Monterrey Section Readies For First AOCS Latin American Short Course Set For January



**Pictured above is the Instituto Technologico y de Estudios Superiores de Monterrey (Monterrey Institute of Technology) which will be the host institution for the first Latin American Short Course of the AOCS, scheduled for Jan. 23–24, 1967. Ing. M. A. Zavala, Associate Professor of the Department of Animal Science and Nutrition is chairman; Q. B. Fidel Villarreal of the Chemistry Department of ITESM is co-chairman.**

## • *Names in the News*


**R. G. Powell**

R. G. Powell (1965), organic chemist at the USDA's Northern Regional Research Laboratory, Peoria, Ill., has been granted a research fellowship by the Department of Chemistry, University of St. Andrews, Scotland. He will work with Professor Frank Gunstone on free radical reactions of unsaturated fatty acids.

M. B. Spitz has been named manager of fatty nitrogen production and marketing of Cargill, Inc.'s chemical products division in Carpentersville, Ill. Assisting Spitz will be J. M. Clumpner, formerly a chemical engineer in the company's Minneapolis research department.

C. M. Cater has been appointed associate director of the Cottonseed Products Research Laboratory and assistant professor in the Department of Biochemistry and Biophysics at Texas A&M University. CPRL, which is headed by A. C. Wamble (1943), is part of the Texas Engineering Experiment Station.

J. B. Strong has been promoted to manager-industrial oil sales for Central Soya. He succeeds S. E. Nelson, who has retired from the company.

C. R. Senior (1958) is now general market manager of the Podbielniak Division of Dresser Industries. Senior's former duties as Podbielniak manager—chemical process markets, will now be performed by J. L. Katz. C. A. Hopper has been appointed manager of the company's new Denver Hydrometallurgy Group.

M. A. Burke has been appointed Mid-South sales representative for the American Mineral Spirits Company, a division of Union Oil Company of California. Burke will be responsible for sales in Louisiana and southern Mississippi and will report to K. W. Keys (1964), Mid-South area manager.

S. L. Taylor has received the first AOAC scholarship award of $600. Taylor is presently a junior in the School of Agriculture, Oregon State University at Corvallis.

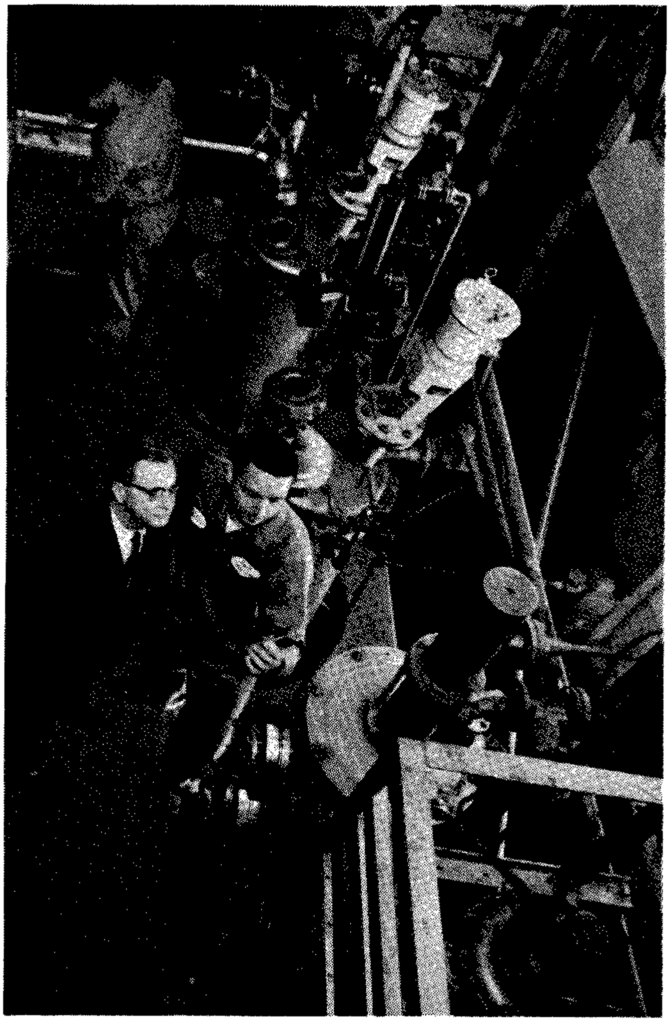

**Nicholas Pelick left and W. R. Supina**

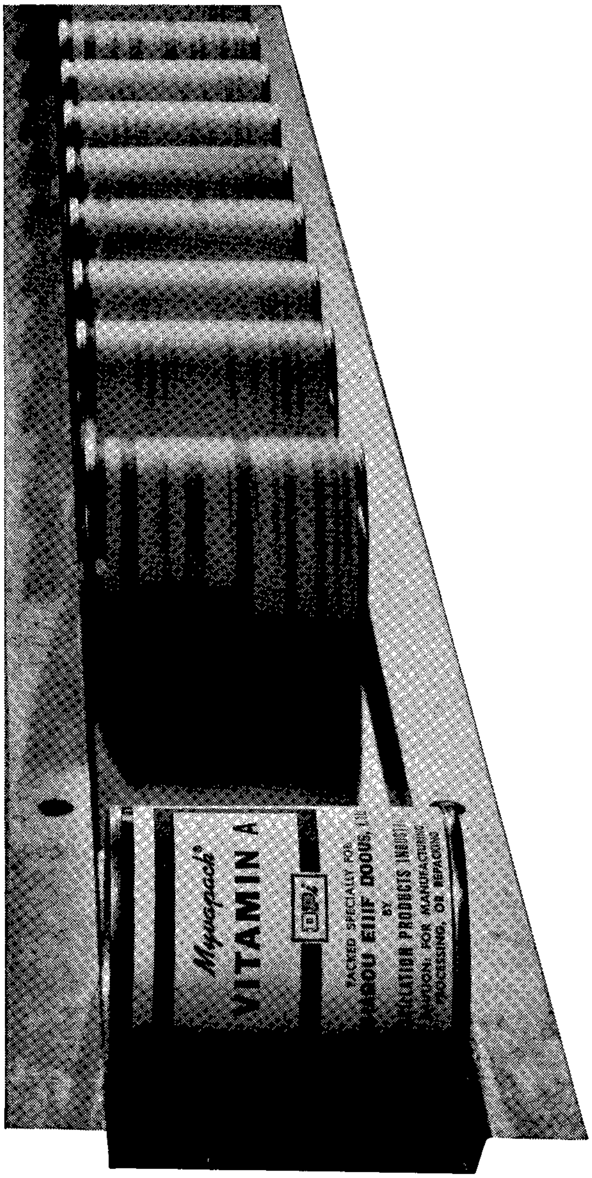
N. Pelick (1962) and W. R. Supina (1964) have formed a new company, SUPELCO, Inc. A large part of SUPELCO's function will be to develop new lipids of major interest, isolated and purified from natural sources. When synthetic lipid products and derivatives are supplied, proof of stated purity will also be furnished. Information can be obtained free of charge by contacting the company's office at P.O. Box 581, 146 S. Water St., Bellefonte, Pa. 16823.

## • *Obituaries*

H. G. Shimp, Sr., president of Hayes G. Shimp, Inc., Albertson, N. Y., died Sept. 14, 1966.

Word has been received at the Chicago Office of the death of W. T. Walton (1941), Paint Research Associates, Inc., of Chicago.





# *Meetings*

## AOCS National Meetings

1967—New Orleans, Roosevelt Hotel, May 7–10. Chicago, Pick-Congress Hotel, Oct. 15–18.

1968—Memphis, Peabody Hotel, April 21–24; New York, Statler Hilton Hotel, Oct. 20–23.

1969—San Francisco, San Francisco Hilton, April 20–23. Minneapolis, Radisson Hotel, Oct. 5–8.

## AOCS Section Meetings

Northeast Section—Dec. 6, 1966, Military Park Hotel, Newark, N. J.

North Central Section—Nov. 16, 1966—"Lipids in Baking" Symposium, Swedish Club, Chicago, Ill., 3 PM.

Southwest Section—Nov. 17, 1966: Jan. 19, 1967; March 16, 1967; May 18, 1967; Michael's Los Feliz, 4500 Los Feliz Blvd., L. A.

## Other Organizations

*Nov. 16–18, 1966—Eastern Analytical Symposium, Statler-Hilton Hotel, New York, N.Y.

Nov. 16, 1966—"Functions of Lipids in Baking Process," Swedish Club, 1258 N. LaSalle St., Chicago, Ill.

November 28–29, 1966—Annual Meeting of Committee D-12 on Soaps and Detergents of the American Society for Testing and Materials, New York City, Barbizon Plaza Hotel.

Nov. 30, 1966—Semiannual Meeting, Society of Cosmetic Chemists, Americana Hotel, New York, N. Y.

*Dec. 5–7, 1966—Theory and Application of Gas Chromatography in Industry and Medicine (Post-Graduate course), Marriott Motor Hotel, Philadelphia, Pa.

*Jan. 23–24, 1967—Processing Short Course, Monterrey Institute of Technology, Monterrey, Mexico.

*Jan. 24–27, 1967—Soap and Detergent Association, 40th Annual Convention, Waldorf-Astoria Hotel, New York, N.Y.

*Jan. 26–28, 1967—American Society for Quality Control, short course "Response Surface Methodology," Chicago, Ill.

*Feb. 5–10, 1967—American Society for Testing and Materials, Spring Meeting, Statler-Hilton Hotel, Detroit, Mich.

Feb. 13–14, 1967—Cottonseed Processing Clinic, Roosevelt Hotel, New Orleans, La.

Feb. 27–March 3, 1967—"Membrane Structure and Function," Alpine Inn, Ste. Marguerite, Quebec, Canada.

March 6–10, 1967—Pittsburgh Conference on Analytical and Applied Spectroscopy Exposition of Modern Laboratory Equipment.

*Apr. 2–6, 1967—American Association of Cereal Chemists, Annual Meeting, Biltmore Hotel, Los Angeles, Calif.

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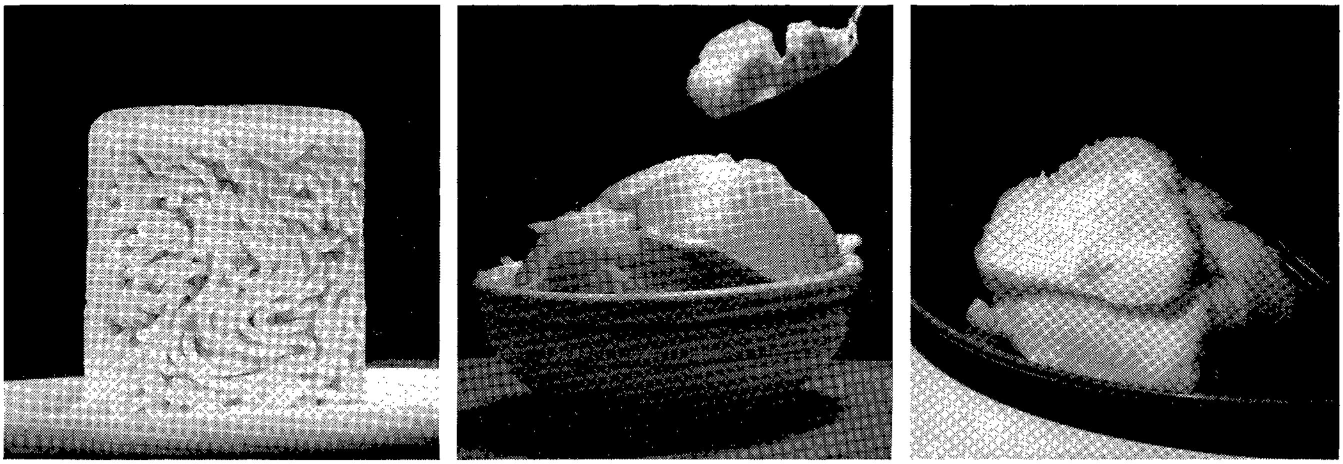
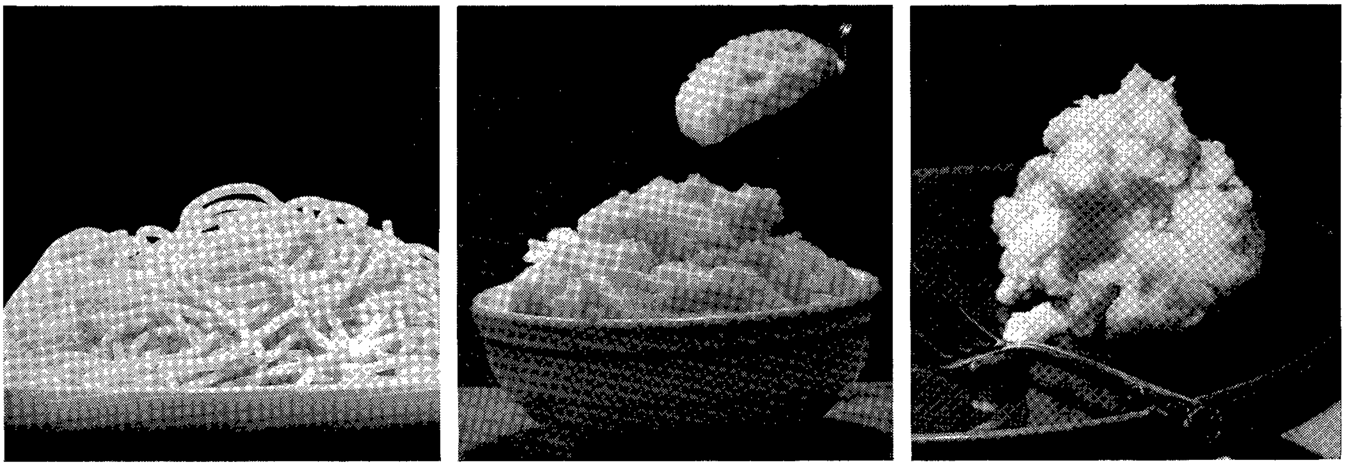
*** Additions to previous calendar**



Problems like these
are vanishing...



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# ABSTRACTS

**R. A. REINERS, Editor. ABSTRACTORS: R. Aguilar B., J. G. Endres, Kazuo Fukuzumi, J. Iavicoli, K. Kitsuta, F. A. Kummerow, Gladys Macy, Louise R. Morrow, E. G. Perkins, T. H. Smouse and J. A. Thompson**

## • Fats and Oils

Thermal reactions of methyl linoleate. I. Heating conditions, isolation techniques, biological studies and chemical changes. W. R. Michael, J. Craig Alexander and N. R. Artman (The Procter & Gamble Co., Miami Valley Lab., Cincinnati, Ohio). *Lipids* 1, 353–58 (1966). Methyl linoleate, diluted with an equal weight of methyl laurate, was heated without exclusion of air at 200C for 200 hours. The reaction mixture was separated by means of molecular distillation, urea adduction, column chromatography, and gas chromatography. Cyclic and aromatic materials were detected in the nonurea adductable monomer fractions. The dimer was separated into polar and nonpolar fractions. Analytical data for the nonpolar dimer are consistent with a cyclic Diels-Alder product. Bioassays showed the nonadductable monomer, the polar dimer, and a fraction of intermediate boiling point to be toxic when administered to weanling male rats. Urea-adductable fractions, nonpolar dimer, and polymer were not toxic. The concentrations of the toxic components were so low that the heated linoleate, before fractionation but after removal of the laurate, was not toxic.

II. The structure of aromatic C-18 methyl esters. W. R. Michael. *Ibid.*, 359–64. This report describes the characterization of C-18 aromatic esters from the heated linoleate and the independent synthesis of two of them. The esters were isolated by a combination of molecular distillation, urea adduction, column chromatography, and gas chromatography. They were characterized by infrared, ultraviolet, NMR, and mass spectroscopy. The analytical data for the isolated esters were compared with the data for the synthetic esters, methyl 11-(2′-methylphenyl)undecanoate, methyl 7-(2′-pentylphenyl)heptanoate, and methyl 8-(2′-butylphenyl)octanoate. The latter two compounds were found to be components of the aromatic fraction isolated from heated linoleate, and their synthesis is described in detail.

III. Characterization of C-18 cyclic esters. W. R. Michael. *Ibid.*, 365–8. This paper presents the isolation and characterization of nonaromatic cyclic monomers formed from the heated linoleate. The esters were isolated by a series of column chromatographic separations, followed by repeated gas chromatography to obtain fractions containing $C_{18}$ cyclic esters. Characterization of the esters was achieved by use of infrared, NMR, mass spectroscopy, and standard chemical analyses. Also characterized were the isomers found in a complex mixture of cyclic monomers which had been partially separated by column chromatography. Use of both physical and chemical methods of analyses permitted characterization of the mixture of isomers without their having been separated from each other.

Isomeric monoethylenic fatty acids in herring oil. R. G. Ackman (Fisheries Res. Board of Canada, Halifax Lab., Halifax, Nova Scotia) and J. D. Castell. *Lipids* 1, 341–48 (1966). Monoethylenic fatty acids from herring oil were concentrated by chromatography on silver nitrate-silicic acid columns. Examination of consecutive fractions by open tubular gas chromatography confirmed the preferential elution of longer chain length esters and of esters within one chain length with the double bond closer to the terminal methyl group. Isomeric monoethylenic fatty acids with double bonds in the positions closer to the carboxyl group than the approximate midpoint of the even-numbered fatty acid chains could not be adequately separated by gas chromatography and were determined by ozonolysis. The isomers observed are consistent with primary formation from saturated acids through the action of an enzyme specifically removing hydrogen atoms in positions $\Delta^9$ and $\Delta^{10}$ relative to the carboxyl group. Chain extension of particular monoethylenic isomers by two carbon atoms in the $C_{20}$ and longer chain lengths is apparently influenced by the position of the double bond.

Identification and distribution of epoxyacyl groups in new, natural epoxy oils. W. H. Tallent, Diana G. Cope, J. W. Hagemann, F. R. Earle and I. A. Wolff (Northern Reg. Res. Lab., Peoria, Ill.). *Lipids* 1, 335–40 (1966). New high-epoxy vegetable oils from nine species representing three plant families and four genera have been investigated. The epoxyacyl moiety in at least one oil from each genus was characterized and shown to be the (+)-vernoloyl (*cis*-12,13-epoxy-*cis*-9-octadecenoyl) group. Intraglyceride distribution studies revealed a general preference of the (+)-vernoloyl groups for the β-position of triglyceride molecules. Interglyceride distribution of (+)-vernoloyl groups was studied in three oils and found not to agree with predictions based on either 1,2,3-random or 1,3-random-2-random distribution. A striking exception to the general intraglyceride distribution pattern was discovered in the monoepoxy triglyceride fraction from *Euphorbia lagascae* seed oil.

Compositional variation in seed oils of the Crepis genus. F. R. Earle, A. S. Barclay and I. A. Wolff (Northern Reg. Res. Lab., Peoria, Ill.). *Lipids* 1, 325–27 (1966). Seed oils from eight species of the genus *Crepis* (family Compositae) fall into three groups differing in chemical composition. Besides conventional fatty acids the oils contain either vernolic acid (47–68%), crepenynic (36–65%), or both (18–35% vernolic and 7–11% crepenynic). Within any one section of the genus, the oils are chemically similar, among the limited groups of samples examined.

The occurrence of methyl methoxystearate isomers in the methyl esters prepared from sheep perinephric fat. R. P. Hansen (Food Chem. Div., Dept. of Scientific and Ind. Res., Wellington, New Zealand) and J. F. Smith. *Lipids* 1, 316–21 (1966). A fraction has been isolated from sheep perinephric fat and identified by techniques which included mass and infrared spectrometry, as a mixture of the 8 to 14- methoxyoctadecanoic acid isomers. It is postulated that these isomers are artifacts produced by rigorous esterification with methanol and concentrated $H_2SO_4$ of a large sample of sheep perinephric fatty acids which are presumed to have contained trace amounts of constituent hydroxy fatty acids. It is estimated that these methoxystearic acid isomers represented approximately 0.08% of the total weight of fatty acids.

Pyrolysis chromatography of lipids. I. Mass spectrometric identification of pyrolysis products of hydrocarbons. R. T. Holman, M. Deubig and H. Hayes (Univ. of Minnesota, The Hormel Inst., Austin, Minn.). *Lipids* 1, 247–53 (1966). The products of pyrolysis at 600C of normal paraffins $C_{10}$–$C_{18}$, 2-methyl octadecane, 4-methyl octadecane, 6-methyl octadecane, cyclohexyl decane, cyclopentyl decane, 2,2,4,4,6,8,8-heptamethyl nonane, pristane and phytane were studied by means of a pyrolysis gas chromatograph directly coupled to a mass spectrometer. n-Paraffins yield a homologous series of n-olefins. Branched paraffins yield two homologous series, one of n-olefins and one of branched olefins. The n-olefin corresponding to the position of the branch is not formed. Interpretation of pyrolograms is similar in principle to the interpretation of mass spectra.

Stereochemistry of α-parinaric acid from Impatiens edgeworthii seed oil. M. O. Bagby, C. R. Smith, Jr. and I. A. Wolff (Northern Reg. Res. Lab., Peoria, Ill.). *Lipids* 1, 263–67 (1966). α-Parinaric acid is a major constituent fatty acid (48%) from *Impatiens edgeworthii* Hook F. seed oil. Partial hydrazine reduction of the tetraene gave products which permit defining the stereochemistry of α-parinaric acid. Its structure is *cis*-9, *trans*-11, *trans*-13, *cis*-15-octadecatetraenoic acid. The tetraene readily reacts with maleic anhydride to give the Diels-Alder product with no *trans*-unsaturation. The formation of this adduct is contrary to previous reports.

Keto fatty acids from Cuspidaria pterocarpa seed oil. C. R. Smith, Jr. (Northern Reg. Res. Lab., Peoria, Ill.). *Lipids* 1, 268–73 (1966). The seed oil of *C. pterocarpa* contains three keto fatty acids with unusually long carbon chains: 15-oxo-*cis*-18-tetracosenoic (5.4%), 17-oxo-*cis*-20-hexacosenoic (13.4%) and 19-oxo-*cis*-22-octacosenoic (3.3%) acids. These acids were isolated by countercurrent distribution of the corresponding methyl esters. Their structures were established by oxidative degradation, by reduction to known compounds, and by nuclear magnetic resonance and infrared spectra.

Isolation and characterization of glycerides in human hair lipids by thin-layer and gas chromatography. E. J. Singh, L. L. Gershbein and H. J. O'Neill (Northwest Inst. for Med. Res., Chicago, Ill.). *Lipids* 1, 274–78 (1966). Techniques for the quantitative analysis of hair lipids using thin-layer chromatography (TLC) together with a proximate analysis of components in one sample deduced by these criteria are presented. Mono-, di- and triglycerides were separated by TLC using Silica Gel G as adsorbent. The chromatoplates were developed with 98% acetone + 2% petroleum ether. Additional checking was affected by IR spectra. For determination of glyceride composition, methyl esters of the component fatty acids were prepared by transesterification and submitted to gas chromatography. Comparison of the levels of each of the constituent fatty acids showed no remarkable differences between the three classes of glycerides in one hair lipid pool. Although certain discrepancies in the amounts of a few fatty acid components might be construed for one pool of lipids from hair of white full-headed men in contrast to findings with two Negro pools, no unequivocal conclusions can be drawn presently.

Chemical composition of the wax secreted by a scale inspect (Ceroplastes pseudoceriferus Green). Yoshio Tamaki (Agricultural Chemicals Inspection Station, Ministry of Agr. and Forestry, Kodaira-shi, Tokyo, Japan). *Lipids* 1, 297–300 (1966). The wax material in the secretion of a scale insect, *C. pseudoceriferus* was analyzed chemically with special interest to the composition of higher fatty acids and higher alcohols. The wax consists of 34.2% fatty acids, 27.1% unsaponifiable matter and 29.5% resin acids. The fatty acids were found to be a complex mixture of 15 normal acids ranging from $C_8$ to $C_{32}$. Of these, octacosanoic, triacontanoic and dotriacontanoic acids comprise over 30% of the wax. Presence of relatively large amount of unsaturated fatty acids of the $C_{18}$ series (2.8% of the wax) is of particular interest. From the unsaponifiable fraction, only one saturated straight chain alcohol, hexacosanol, was detected (2.7% of the original wax). The other unsaponifiable matter was considered to be cyclic or branched carbon chain, and consisted of at least 12 to 20 compounds. The resin acid fraction was also found to be a complex mixture of at least 13 to 14 components.

The trans-3-enoic acids of Grindelia oxylepis seed oil. R. Kleiman, F. R. Earle and I. A. Wolff (Northern Reg. Res. Lab., Peoria, Ill.). *Lipids* 1, 301–4 (1966). *trans*-3-Hexadecenoic acid (14%) and the previously unreported *trans*-3-octadecenoic acid (2%) have been identified in seed oil of *G. oxylepis* Greene, Compositae. Evidence was also found for the existence of other acids with *trans*-3 unsaturation.

Preparation of pure methyl esters by counter double current distribution. C. R. Scholfield, R. O. Butterfield and H. J. Dutton (Northern Reg. Res. Lab., Peoria, Ill.). *Lipids* 1, 163–65 (1966). Counter double current distribution with continuous stills for solvent and product recovery and an acetonitrile-hexane solvent system is a convenient method for preparative isolation of individual fatty methyl esters. Preparations of pure methyl linoleate from safflower esters and a methyl arachidonate concentrate from hog liver lipids are described.

A simple, rapid micromethod for the determination of the structure of unsaturated fatty acids via ozonolysis. E. Christense Nickell and O. S. Privett (Univ, of Minnesota, The Hormel Inst., Austin, Minn.). *Lipids* 1, 166–70 (1966). A micromethod for the localization of double bonds in unsaturated fatty acids via ozonolysis employing pyrolytic cleavage of ozonides in the presence of a hydrogenation catalyst is described. Cleavage of the ozonides is carried out in a gas-liquid chromatographic instrument in a small glass tube, containing the catalyst, inserted in the top of the column opposite the input heaters at 225C. Ozonides of methyl esters of straight chain unsaturated fatty acids are cleaved through the action of the catalyst to aldehyde fragments which are swept simultaneously into the column for analysis. The double bond positions are deduced from the chain length of the fragments. The method is demonstrated on methyl oleate, linoleate, linolenate and arachidonate.

Mass spectrometry of lipids. I. Cyclopropane fatty acid esters. W. W. Christie and R. T. Holman (The Hormel Inst., Univ. of Minnesota, Austin, Minn.). *Lipids* 1, 176–82 (1966). A method was developed for the almost quantitative conversion of unsaturated esters (from monoenes to tetraenes) to cyclopropanes using diiodomethane and a highly active zinc-copper couple. These derivatives are sufficiently volatile for GLC analysis and *cis* and *trans* isomers can be distinguished by this technique. Equivalent chain lengths of the cyclopropane derivatives were measured on polar and nonpolar phases. The mass spectra of the monocyclopropane compounds are very similar to those of the parent unsaturated esters. Those of dicyclopropanes, however, are quite distinctive so that the original structure of the ester can be deduced. Polycyclopropanes give complex spectra which are difficult to interpret in terms of the position of the original double bonds.

The structure of the glycerides of ergot oils. L. J. Morris and S. W. Hall (Biosynthesis Unit, Unilever Res. Lab., Colworth House, Sharnbrook, Bedford, England). *Lipids* 1, 188–96 (1966). The oils from sclerotia or from suitable mycelial cultures of *Claviceps purpourea* (ergot) contain up to 44% of ricinoleic acid but no free hydroxyl groups. This is due to the presence of, besides normal triglycerides, tetra-acid, penta-acid and hexa-acid triglycerides. These contain respectively one, two and three ricinoleic acids esterified to glycerol, these in turn being acylated at their hydroxy groups with normal long-chain fatty acids. By suitable complementary use of TLC, GLC and lipase hydrolysis techniques, the proportions, compositions and structures of these novel triglyceride classes were determined. Four types of positional specificities in fatty acid combinations could be shown by our procedures. These are discussed and, on the basis of our results, some tentative proposals as to possible biosynthetic mechanisms are advanced.

Fatty acid distribution in the bovine pre- and postpartum testis. B. Ahluwalia and R. T. Holman (Univ. of Minnesota, The Hormel Inst., Austin, Minn.). *Lipids* 1, 197–201 (1966). Testes from fetuses, calves, bulls and recently castrated animals were analyzed for total lipids, lecithin, cephalin, triglycerides, diglycerides, cholesteryl esters and cholesterol. Total lipids increase somewhat with age, but in the castrated animal the increase is more marked. Phospholipid content increases with age, but decreases in the castrated animal. Cholesterol decreases and triglyceride increases after birth and in the castrated animal. Polyunsaturated acids increase with age in all lipid classes. Eicosatrienoic acid is more abundant in fetal testicular lipids than in testes removed after birth. In the castrated testis there is a general decrease in the unsaturated fatty acids. Acids of the $\omega 6$ family are the predominant polyunsaturated acids and increase somewhat with age in all lipids. The $\omega 3$ family of polyunsaturated acids appears mostly toward the end of fetal life and increases after birth. Acids of the linoleate family reach approximately 25% of total acids in most lipid classes at maturity whereas the $\omega 3$ acids range from 1 to 9%.

Fractionation of triglyceride mixtures by preparative gas chromatography. A. Kuksis and J. Ludwig (Dept. of Biochem., Queen's Univ., Kingston, Ontario, Canada). *Lipids* 1, 202–8 (1966). A semiautomatic system is described for gas-chromatographic separation and recovery of triglycerides of uniform molecular weight in milligram quantities. It employs an Aerograph Autoprep 700 (Wilkins Instrument and Research, Inc.) equipped with a stream splitter and a hydrogen flame ionization detector. The column is an aluminum or stainless steel tube (¼ in. O.D. × 2 ft) and contains silanized Chromosorb W (60–80 mesh) coated with 5% (w/w) JXR or SE-30. Five to ten milligrams of mixed triglyceride are injected at a time and the temperature is programmed exponentially from 150 to 350C. With split ratios of 1:5 to 1:10 collections of 20 to 50 mg of each peak can be made with some 10 to 20 injections.

A comparative study of the phospholipids and fatty acids of some insects. P. G. Fast (Insect Pathol. Res. Inst., Sault Ste. Marie, Ontario, Canada). *Lipids* 1, 209–15 (1966). Phospholipids of 27 species of insects representing 6 orders and 20 families were examined by DEAE cellulose column chromatography to determine the choline/ethanolamine phosphoglyceride ratios, and by gas chromatography to determine the constituent fatty acids. The phosphorus in the ethanolamine phosphoglycerides accounted for approximately 50% of the total lipid phosphorus in aphids (Homoptera) and in all but one family of Diptera (flies) examined while the phosphorus in the choline phosphoglycerides accounted for only about 25%. Ethanolamine and choline phosphoglycerides were present in approximately equal proportions in one family of Diptera and in the Coleoptera (beetles) examined. In the other insects examined choline phosphoglycerides predominated, ethanolamine phosphoglycerides comprising only about 25–30% of total lipid phosphorus as they do in most mammalian tissues. Diptera in which ethanolamine phosphoglycerides were the major phosphatides were also characterized by high proportions of fatty acids less than 18 carbons long, particularly palmitoleic acid, in the neutral lipids. Aphids are characterized by a preponderance of 14-carbon fatty acids. The evidence suggests that predominance of ethanolamine phosphoglycerides is associated with a preponderance of shorter chain fatty acids in the neutral lipids. Differences also exist between Diptera and other insects in the fatty acid compositions of different phosphatides, particularly with respect to the distribution of 18-carbon acids. The compositions observed in insects that contained large amounts of the choline phosphoglycerides are similar to those found in vertebrates. Similarities in fatty acid composition of the choline phosphoglycerides in such widely divergent organisms suggest that the fatty acids may play a greater role in phospholipid function than has heretofore been demonstrated.

Gas-Liquid chromatography of triglycerides from erucic acid oils and fish oils. R. D. Harlow, C. Litchfield and R. Reiser (Dept. of Biochem. and Nutr., Texas Agr. Expt. Station, College Station, Texas). *Lipids* 1, 216–20 (1966). By critically selecting optimum operating conditions, quantitative gas-liquid chromatography of triglycerides has been extended to molecules containing substantial amounts of $C_{20}$, $C_{22}$, and $C_{24}$ fatty acids. The triglycerides of four erucic acid oils (water cress, rapeseed, nasturtium, and *Lunaria annua*) and two fully hydrogenated fish oils (menhaden and tuna) have been quantitatively analyzed by this technique. The average fatty acid chain length calculated from the triglyceride composition of each oil agreed closely with that determined by GLC of its respective methyl esters. Several conclusions about the triglyceride composition of the fats analyzed are discussed.

Determination of the specific positions of cis and trans double bonds in polyenes. O. S. Privett and E. C. Nickell (The Hormel Inst., Univ. of Minnesota, Austin, Minn.). *Lipids* 1, 98–103 (1966). A method is described for the determination of the positions and geometric configurations of double bonds in polyunsaturated fatty acids. The procedure consists of three steps: 1) Partial reduction of the double bonds with hydrazine under conditions which give high yields of monoenes. 2) Isolation of the *cis*- and the *trans*-monoene fractions by thin-layer chromatography (TLC) directly or in the form of their ozonide derivatives. In the former technique, selective argentation is employed, in the latter, silicic acid adsorption. 3) Determination of the structure of the monoenes via reductive ozonolysis.

The position of the double bonds is determined from the structures of the monoenes. Since the *cis*-monoenes are separated from the *trans*-monoenes the geometric configuration of each double bond is determined. The method also provides a direct determination of the spacings of the internal double bonds and it may be employed for the determination of the structures of mixtures of fatty acids in conjunction with direct ozonolysis procedures. The various ramifications of the method are demonstrated on pure fatty acids and model mixtures thereof.

Quantitative determination of unsaturation in oils by using an automatic-titrating hydrogenator. T. K. Miwa, W. F. Kwolek and I. A. Wolff (Northern Reg. Res. Lab., Peoria. Ill.). *Lipids* 1, 152–57 (1966). A procedure was developed to adapt an automatic-titrating hydrogenator to the rapid determination of unsaturated carbon-carbon bonds in seed oils. Its utility as a research tool for detecting unusual types of unsaturation was demonstrated by analysis of 35 oils. When the hydrogen-iodine value of an oil determined by the hydrogenator differed significantly from the iodine value by the Wijs method, the presence of unsaturation such as acetylenic or conjugated double bonds was indicated. For repetitive analysis of samples of the same oil, or of oils having nearly the same extent of unsaturation, the hydrogenator can successfully accommodate injection of a new sample every 2 to 5 min. Possible utility of the method for monitoring samples from a processing plant is apparent.

Determination of the structure of lecithins. M. L. Blank, L. J. Nutter and O. S. Privett (The Hormel Inst., Univ. of Minnesota, Austin, Minn.). *Lipids* 1, 132–35 (1966). A method is described for the determination of the classes of lecithins in terms of unsaturated and saturated fatty acids based on a total fatty acid composition, the composition of the fatty acids in the β-position, and the amount of disaturated class determined via mercuric acetate adduct formation. The accuracy of the method was determined on lecithins of known composition and the method was applied to lecithins isolated from milk serum and egg lipids, safflower and soybean oils.

Glycolipids of Briza spicata seed. C. R. Smith, Jr., and I. A. Wolff (Northern Reg. Res. Lab., Peoria, Ill.). *Lipids* 1, 123–27 (1966). The seeds of *Briza spicata* contain 20% of lipid that is semisolid and quite unusual in character. This lipid contains 49% digalactosylglycerides, 29% monogalactosylglycerides, and consequently little, if any, conventional triglycerides. The predominant fatty acids present are palmitic, oleic, and linoleic. Partial resolution of the galactosylglycerides on the basis of fatty acid composition was achieved by counter-current distribution.

Fatty acids of Lindera umbellata and other Lauraceae seed oils. C. Y. Hopkins, Mary J. Chisholm and Linda Prince (Div. of Pure Chem., Nat. Res. Council, Ottawa, Ontario, Canada). *Lipids* 1, 118–22 (1966). Seed kernel oils of seven species of Lauraceae were examined and the fatty acid composition of six of these was determined. The oil of *Lindera umbellata* had 4% of *cis*-4-decenoic, 47% of *cis*-4-dodecenoic, and 5% of *cis*-4-tetradecenoic acid in the total fatty acids. Positive identification of these acids was made and new derivatives were prepared. Possible routes of biosynthesis are discussed. Oils from the other species did not contain more than a trace of unsaturated $C_{10}$–$C_{14}$ acids. Their major acids were capric and lauric with varying amounts of unsaturated $C_{18}$ acids.

Laboratory contaminants in lipid chemistry: Detection by thin-layer chromatography and infrared spectrophotometry and some procedures minimizing their occurrence. G. Rouser, G. Kritchevsky (Dept. of Biochem., City of Hope Med. Center, Duarte, California), Mary Whatley and C. F. Baxter. *Lipids* 1, 107–12 (1966). Many sources of contamination for lipid preparations exist in the laboratory. These contaminants can be detected using thin-layer chromatography (TLC) and infrared spectroscopy. Numerous components that are potential contaminants and can lead to false analyses were demonstrated by TLC in laboratory soaps, cleaners, hand creams and lotions, hair tonics, laboratory greases, floor waxes, oil vapors, tobacco smoke, hydrocarbon phases for gas-liquid chromatography, etc. Procedures preventing introduction of contaminants are presented including descriptions of equipment and precautions to eliminate or minimize contamination. These are useful in isolation of pure polar and nonpolar lipids.

An electrostatic precipitator for preparative gas-liquid chromatography. L. Borka and O. S. Privett (Univ. of Minnesota, The Hormel Inst., Austin, Minn.). *Lipids* 1, 104–6 (1966). The effect of the operating variables of electrostatic precipitators on the recovery and structure of methyl esters and related aerosol forming compounds collected in preparative gas-liquid chromatography was studied. Aerosol formation was prevented by AC or DC voltages of 5000 to 12000 volts. AC was more effective than DC but caused changes in structure which were detectable by both thin-layer and gas-liquid chromatographic methods of analysis. An apparatus of simple construction and operation was designed for the collection of methyl esters and its use demonstrated with several model compounds.

Present status of rice bran oil industry in India. K. S. Murti (Osmania Univ. Dept. of Chem. Tech., Hyderabad, India). *Indian Oil Soap J.* 31 (8), 217–233 (1966). The chemistry and technology of the manufacture of rice bran oil and rice bran is reviewed.

The detection of adulteration of sesame oils with vegetable oils by thin layer chromatography. R. K. Shivastava

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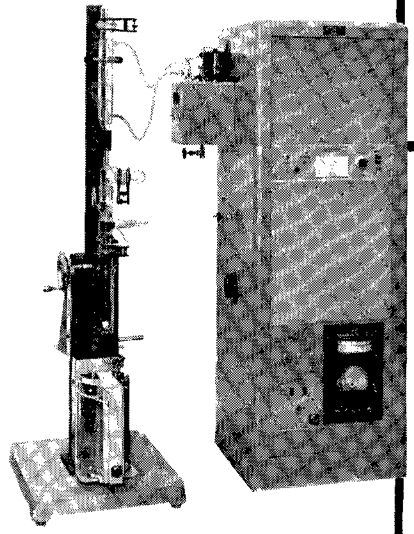

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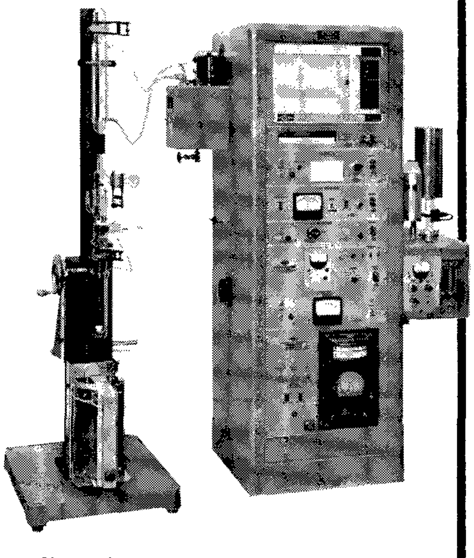

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and P. G. Bhutey. *Indian Oil Soap J.* 31, No. 9, 264–267 (1966). Adulterants, such as linseed, peanut and safflower oils, in sesame oils can be detected as low as the 5% level with use of reverse phase thin layer chromatography.

VAPOR PHASE HYDROGENATOR FOR UNSATURATED FATTY ACIDS. J. Lecerf and J. Bezard (Dept. of Nutr., Fac. of Sci., Dijon, Fr.). *Rev. Franc. Corps Gras* 13, No. 7, 455–462 (1966). In the gas chromatography of fish oils, a complex mixture of fatty acids, including polyunsaturated acids, is obtained. A method has been developed by which the individual fatty acid effluent from a gas chromatography column is hydrogenated. The saturated fatty acids are collected and then rechromatographed. From the second chromatograph it is possible to determine the chain length of the corresponding polyunsaturated acid.

A TENTATIVE PROCEDURE FOR THE CORRELATION OF CHEMICAL VALUES AND FLAVOR MODIFICATIONS OF EDIBLE TALLOWS DURING THE INDUCTION PERIOD. M. Loury, G. Lechartier and C. Bloch (Lab. Jean Ripert, Inst. of Fats and Oils, Paris, Fr.). *Rev. Franc Corps Gras* 13, 395–406 (1966). Animal fats have a natural, fresh flavor which is generally acceptable. However, unstabilized animal fats readily become rancid. There are chemical tests which can easily detect rancidity, but these tests are of no value since a rancid fat has little commercial value. Between the two extreme states, freshness and rancidity, there are different states of fats which can be detected organoleptically, but show no definite analytical differences. It was concluded that an estimate of peroxide values is very important and can give more information than the generally used carbonyl value.

ON THE AUTOXIDATION OF FATTY METHYL ESTERS WITH AND WITHOUT QUERCETIN. A. Letan (Dept. of Food and Biotech., Haifa, Israel). *Oleagineux* 21, 377–380 (1966). Fatty-acid methyl esters from cottonseed oil were autoxidized at 60C, with and without quercetin, to a peroxide value of about 500 µM/g. The changes in peroxide value and in extinction at 232 and 270 mµ (conjugated dienes and trienes) were measured and related to the decrease in the content of quercetin. Extinction at 232 mµ increased linearly with peroxide value and the peak at 270 mµ initially present in the esters disappeared. In the substrate oxidizing without quercetin no induction period was observed; in the esters, oxidizing in presence of quercetin (0.023%, w/w) the induction period lasted 215 hours and the rate of peroxide accumulation was at that stage about 7 times slower than during the post-induction period. During the induction period the rate of loss of quercetin was about 8 times slower as compared with the later stage of oxidation, and the average chain-length of the free radical reaction also about 8 times shorter.

RAPID REPRODUCIBLE PROCEDURE FOR PREPARATION OF WAFERS OF DRIED FOODS, ESPECIALLY THOSE OF HIGH FATTY CONTENTS: A TOOL FOR COLORIMETRY. L. C. Berardi, W. H. Martinez, G. J. Boudreaux and V. L. Frampton (Southern Regional Res. Lab., U.S. Dept. of Agr., New Orleans, Louisiana). *Food Technol.* 20 (9), 120–22 (1966). A method is described for rapid reproducible manufacture of wafers of dried foods possessing uniform smooth surfaces. The method involves the distribution of the dry food sample between thin disks of Teflon in a die. After the die and its contents are evacuated for a short specified time, they are pressed quickly with a relatively low pressing load to form wafers which can be used in reflectance measurements. Wafers of the same food sample yielded nearly identical reflectance spectra. A high degree of reproducibility as measured by reflectance spectra was also obtained with wafers prepared by different operators with different presses. The method was found satisfactory for preparing wafers of dry foods of high fatty contents, such as lyophilized egg yolks and lyophilized peanut butter, as well as those of intermediate or low fatty contents.

EVALUATION OF LIPID OXIDATION IN PLANT TISSUES. Ki Soon Rhee and Betty M. Watts (Dept. of Food and Nutr., Florida State Univ., Tallahassee, Florida). *J. Food Sci.* 31, 664–8 (1966). Essential to application of the TBA test to plant tissues as a measure of prior lipid oxidation is inactivation of lipoxidase in the blending procedure by a strong acid. The production of TBA-reactive material during blending without acid may give a useful measure of the "lipid oxidation potential" of vegetable materials, as affected by their content of lipoxidase, substrate and antioxidants. Comparative data are presented on fatty acids and lipoxidase in dried Blackeye and Green (Burpee's blue bantam) peas, and the data are related to the TBA values in blending of these peas. Wide distribution of lipoxidase in vegetables and fruits has been demonstrated. Among the materials analyzed, the extracts of roots, tubers, botanical fruits with edible seed portion, and seeds usually showed a high lipid-oxidizing activity. Comparing families, the extracts of many vegetables belonging to *Leguminosae, Solanaceae,* and *Cruciferae* had relatively higher activity.

EFFECT OF ANTIOXIDANTS ON LIPOXIDASE ACTIVITY IN MODEL SYSTEMS AND PEA (PISUM SATIVUM) SLURRIES. *Ibid.*, 669–74. The antioxidants BHA, propyl gallate, quercetin, gallic acid, turnip green extract and sodium tripolyphosphate were tested for their inhibitory effect on linoleate oxidation catalyzed by purified soybean lipoxidase or crude pea lipoxidase, and on lipid oxidation occurring in blending of peas. In artificial lipoxidase-linoleate systems, most phenolic inhibitors, especially BHA and propyl gallate, were very effective, but sodium tripolyphosphate was ineffective. The effectiveness of antioxidants decreased with increase in lipoxidase concentration. The relative effectiveness of the various antioxidants was quite different in pea slurries from that in artificial systems. Higher concentrations of propyl gallate, turnip green extract and sodium tripolyphosphate retarded the pea lipid oxidation, but no significant inhibitory effect was found with other antioxidants tested. Factors which might contribute to variations in the behavior of antioxidants in pure model systems versus raw pea slurries are discussed. Hydrogen peroxide at concentrations of 0.005% or higher rapidly destroyed lipoxidase activity.

LIPID OXIDATION IN FROZEN VEGETABLES IN RELATION TO FLAVOR CHANGE. *Ibid.*, 675–79. The TBA test, adapted for vegetable material, was useful in following lipid oxidation in frozen peas. Gas-liquid chromatographic analysis for the loss of unsaturated fatty acids was not feasible for determining lipid oxidation in unblanched vegetables. This work has established that rancidity is not a main cause of flavor deterioration in frozen Blackeye peas (*Vigna sinensis*) and possibly in other frozen vegetables. The amount of lipid oxidation occurring in frozen raw peas was too small to produce rancid odors. Lipoxidase was rapidly inactivated by a short blanching time, and no regeneration of the enzyme occurred during frozen storage of garden peas (*Pisum sativum*).

EFFECTS OF LIPIDS ON BREAD BAKED FROM FLOURS VARYING WIDELY IN BREAD-MAKING POTENTIALITIES. Y. Pomeranz, G. L. Rubenthaler, R. D. Daftary and K. F. Finney (Dept. of Flour and Feed Milling Industries, Kansas State Univ., Manhattan, Kansas). *Food Technol.* 20 (9), 131–34 (1966). Bread was baked from flour milled from hard red winter, hard red spring, soft red winter, durum, and club (white) wheat varities, each from the 1963 and 1964 crops. Loaf volumes were increased 87–195 cc and crumb grains were improved by adding 3 g vegetable shortening per 100 g of flour. The improving effect increased steeply from additions of up to 1.5 g shortening, and thereafter increased only slightly up to 4.5 g shortening. Adding 0.5 g polar lipids isolated from 6 flours to a composite hard red winter flour almost equaled the improving effect of 3 g shortening; adding 0.5 g non-polar flour lipids had very little effect; and adding 0.5 g unfractionated original flour lipids had an immediate effect. Neither shortening nor any of the tested wheat flour lipids affected gassing power. Loaf volume increase and crumb grain improvement were accompanied by parallel retardation of crumb-firming during storage. The effects on bread quality of shortening or of polar lipids were independent of wheat class or variety.

CHANGES IN EXTRACTABILITY OF LIPIDS DURING BREAD-MAKING. Chien-Mei Chiu and Y. Pomeranz (Dept. of Flour and Feed Milling Industries, Kansas State Univ., Manhattan, Kansas). *J. Food Sci.* 31, 753–58 (1966). Free lipids were extracted with petroleum-ether, and total lipids with a chloroform-methanol mixture from flour, dry milk solids, yeast, dough, fermented dough, bread crumb and bread crust. Dough formulations used in bread making included (in addition to a basic formula of flour, water, yeast and sodium chloride) either sugar, commercial vegetable shortening, and dry milk solids, or their combinations. The extracted lipids were fractionated by thin-layer chromatography (TLC). Petroleum ether-soluble flour lipids were reduced to ⅓ during dough mixing or fermentation; subsequent baking lowered the residual free lipids to half. Petroleum ether-soluble free lipids were affected little by dough composition. Only small amounts of hydrogenated vegetable shortening were bound during dough mixing, but about ⅓ to ½ of the added shortening lipids became bound during baking. Processing flour into bread had no effect on the amounts of total lipids extractable by the chloroform-methanol mixture. Fractionation of extracted lipids by TLC showed that much more polar wheat flour lipids than nonpolar components were bound during dough mixing.

FATTY ACIDS IN NEUTRAL LIPIDS AND PHOSPHOLIPIDS FROM CHICKEN TISSUES. M. A. Katz, L. R. Dugan, Jr. and L. E. Dawson (Food Science Dept., Michigan State Univ., East Lansing, Michigan). *J. Food Sci.* 31, 717–20 (1966). Lipid material from skin, depot fat, and dark and white meat from broiler-type male chickens was fractionated into neutral lipids and phospholipids by column chromatography. The fatty acids of these fractions were analyzed by gas-liquid chromatography. Muscle tissues contained relatively larger quantities of phospholipids than did skin and depot fat. Neutral lipids and phospholipids had similar percentages of unsaturated fatty acids. Some 18 different fatty acids were found in the neutral lipids, and 22 fatty acids were found in the phospholipid fraction. The composition of fatty acids in the neutral lipids was similar in the four tissues. Phospholipids from muscle tissues contained more long-chain fatty acids than phospholipids from skin and depot fat. Arachidonic acid was found to be one of the major fatty acids in the phospholipid fraction.

GAS-SOLID CHROMATOGRAPHY OF HYDROCARBONS ON ACTIVATED ALUMINA. EFFECT OF CARRIER GAS ON RETENTION TIME AND COLUMN EFFICIENCY. R. L. Hoffmann and C. D. Evans (Northern Reg. Res. Lab., Peoria, Ill.). *Anal. Chem.* 38, 1309–12 (1966). The quantitative accuracy of gas-solid chromatography (GSC) of hydrocarbons on activated alumina depends on instrumental paramenters. Retention times, peak width, peak height and column efficiency vary with certain molecular characteristics of the carrier gases used to elute hydrocarbons from actviated alumina. These characteristics include mass, atomic cross section and composition. Experimental GSC data have been correlated with these molecular characteristics for eight pure carrier gases. The molecular weight and structural types of hydrocarbons amenable to alumina GSC are strongly influenced by the particular carrier gas selected. Hydrogen and carbon dioxide elute saturated hydrocarbons up to C-12, whereas at the same theoretical plate efficiency helium can elute members up to C-6 only. For unsaturated hydrocarbons, degree of unsaturation and molecular weight set the elution limit. At elevated temperatures column efficiencies for the different carrier gases became similar.

THEORY OF GEL FILTRATION (PERMEATION) CHROMATOGRAPHY. J. C. Giddings and K. L. Mallik (Dept. of Chem., Univ. of Utah, Salt Lake City, Utah). *Anal Chem.* 38, 997–1000 (1966). The theory of zone broadening in gel filtration chromatography is formulated. Starting with a general plate height equation, particular contributions are evaluated in the light of the unique characteristics of this technique. Experimental values, taken from several literature sources, are shown to often exceed the hoped for limits characteristic of high efficiency columns. Reasons for this, including the large ratio of column to particle diameter, are discussed. It is concluded that the excess plate height is not due to stationary phase nonequilibrium because this term is almost negligibly small in gel filtration. This, along with coupling, permits a relatively high speed of operation.

PHOSPHOLIPID-METAL COMPLEXES. INTERACTION OF TRIPHOSPHOINOSITIDE- AND PHOSPHATIDYLSERINE-METAL COMPLEXES WITH ETHYLENEDIAMINE, POLYAMINOACIDS AND PROTEIN. J. G. Fullington and H. S. Hendrickson (Western Reg. Res. Lab., U.S. Dept. Agr., Albany, Calif.). *J. Biol Chem.* 241, 4098–4100 (1966). When ovalbumin, poly-L-lysine, poly-L-aspartic acid, or ethylenediamine is added to a biphasic chloroform-methanol-water system containing the Mg(II), Ni(II), or Ca(II) complex of triphosphoinositide or phosphatidylserine, mixed complexes are formed as evidenced by the formation of an interfacial precipitate similar to that observed by Dawson containing phospholipid, metal, and protein or polyamino acid, or by the presence of ethylenediamine in the chloroform-rich phase where it is ordinarily insoluble. Stable mixed complex formation was shown by gel filtration studies. Analysis of complexes before and after gel filtration indicates stable binding of one ethylenediamine per phospholipid-metal unit and weak binding of an additional molecule of the amine. Polylysine is bound to the triphosphoinositide-Ni(II) complex in a 0.64:1 ratio on a weight basis.

MICROREACTOR CHROMATOGRAPHY. QUANTITATIVE DETERMINATION OF DOUBLE BOND POSITIONS BY OZONIZATION—PYROLYSIS. V. L. Davison and H. J. Dutton (Northern Reg. Res. Lab., Peoria, Ill.). *Anal. Chem.* 38, 1302–05 (1966). Direct injection of ozonized fatty esters into the heated injector port of a gas chromatograph offers a one-step procedure for decomposing ozonides and for analyzing the resulting aldehydic fragments to determine double bond positions. In this manner, microliter samples of ozonides may be analyzed. Acidic functional groups, formed during thermal cleavage, have been effectively eliminated by inserting a short column containing well oxidized zinc granules or zinc oxide on an inert support between the injector port exit and the fractionating column. Monoaldehydes and aldehydic esters were effectively separated in a temperature-programmed gas chromatograph and a mixed polyester-glycol, liquid phase column. A microreactor apparatus has been developed as an independent accessory in which a 5-ul. sample may be successively ozonized, thermally cleaved, and injected without sample transfer and attendant losses. This procedure provides an easy and rapid analysis and is particularly adapted to samples available only in limited amounts.

FACTORS AFFECTING MACADAMIA NUT STABILITY II. ROASTED KERNELS. A. Dela Cruz, C. Cavaletto, H. Y. Yamamoto and E. Ross (Dept. Food Sci. Technol., Univ. Hawaii, Honolulu, Hawaii). *Food Technol.* 20 (9), 123–4 (1966). The effects of moisture, heat and light on the storage stability of roasted macadamia kernels, *Macademia integrifolia* 'Keauhou 246,' were evaluated by chemical and sensory methods. Kernels of 1.1% moisture had good stability under all storage conditions, showing slight quality decreases but developing no staleness in 16 months of storage. Kernels of 1.7 and 2.9% moisture had poor storage stability. Generally, quality over a 16-month period decreased with increasing moisture content and increasing storage temperature. Small differences in free fatty acid values where highly correlated with differences in flavor scores. Light had no obvious effect on storage stability.

COMPOSITION OF COMMERCIAL PEANUT BUTTERS. Sara Roberson, J. E. Marion and J. G. Woodroof (Georgia Expt. Station). *J. Am. Dietet. Assoc.* 49, 208–10 (1966). Thirty brands of commercial peanut butter were analyzed for moisture, oil, protein and fatty acid composition. Organoleptic evaluations were also made on the samples. Results showed wide differences in protein and oil content between samples. The major fatty acids were, in order of decreasing magnitude: oleic, linoleic, palmitic and stearic. Other fatty acids noted were: behenic, arachidic, linolenic and lignoceric. Differences were noted in the fatty acid composition of different samples. The levels of palmitic and linoleic acids appeared to be inversely related to total sensory scores and had correlation coefficients of −0.52 and −0.38, respectively.

LOW CALORIC FATTY SPREAD. H. J. Duin and J. A. Schaap (Lever Brothers Co.). *U.S. 3,266,904.* A low-energy fatty composition suitable for spreading on bread consists of a water-in-fat emulsion in which the fat phase amounts to 40–60% of the total weight and is composed of edible fat emulsified with margarine emulsifiers consisting of a mixture of partial glycerides and phosphatides and in which the aqueous phase contains as its major constituent 4–20% of its weight of a protein such as casein or albumin.

PROCESS FOR IMPROVING THE FLAVOR STABILITY OF PEANUT BUTTER. J. S. Baker, R. E. Mersfelder and R. L. Wille (Procter & Gamble Co.). *U.S. 3,266,905.* The described process consists of the following steps: (a) injecting inert gas into a peanut butter slurry at a rate ranging from about 6–30 volume % of the rate the slurry is being pumped in the process system at the point of injection and while the slurry is maintained in a process system under a positive pressure of a least 3 atmospheres, (b) retaining the inert gas in the process system for a period of time sufficient for substantially dissolving the inert gas in the slurry, (c) subsequent to the solution of the inert gas, flashing the slurry to substantially atmospheric pressure whereby an oxygen-inert gas mixture is released from solution in the slurry, (d) removing the released oxygen-inert gas mixture from the system, (e) rapidly chilling the slurry to a temperature less than 100F to crystallize the glyceride solids in the slurry, and (f) packing the crystallized peanut butter in an oxygen-free atmosphers. The steps (a) through (d) are carried out a plurality of times so that the peanut butter contains not more than about 0.5 volume % of dissolved, absorbed, entrained and accessible oxygen when measured within 15 minutes after packing.

PREPARATION OF WHIPPABLE COMPOSITIONS. R. F. Kozlik and J. L. Swanson (General Mills, Inc.). *U.S. 3,266,907.* The process of making a dry whippable composition for use in the preparation of dessert toppings and icings from a mixture consisting of 5–15 parts shortening, 3–10 parts emulsifier, 45–85 parts sugar, 2–6 parts proteinaceous material, 0–20 parts flavoring agents, 0–1.5 parts lecithin compound, 0–0.6 part citric acid and 0–2.0 parts dye comprises: (1) agitating the shortening and emulsifier to form a homogeneous mass; (2) passing the resulting mass through a scraped-surface heat exchanger to obtain a plastic mass having a fine crystal structure, and (3) intensively blending the resulting plastic mass with the sugar, proteinaceous material, flavoring agents, lecithin, citric acid and dye so that substantially all of the sugar and proteinaceous material particles are smeared with the plastic mass to produce the dry whippable composition without further treatment.

AQUEOUS EMULSION COMPOSITION. J. F. Abere (Minnesota Mining and Mfg. Co.). *U.S. 3,266,921.* An aqueous emulsion comprises an amount not in excess of about 50% by weight based on water of a polymerized polyene fatty acid having a plurality of carboxyl groups per molecule, at least a stoichiometric equivalent of a polyalkylenimine curing agent and an emulsifying agent.

STABILIZED CAKE BATTER SYSTEM AND PROCESS FOR PRODUCING SAME. R. G. K. Strobel (Procter & Gamble Co.). *U.S. 3,268,338.* A process for improving a cake batter system comprising shortening, flour, water and sugar, comprises incorporating in the batter emulsion from 0.5–16%, by weight of the shortening, of an alpha-phase crystal-tending emulsifier which is lipophilic and hydrophilic and contains at least one higher fatty acid radical having from 12–22 carbon atoms and at least one free and unesterified hydroxyl group, from 0.1–8% of a high temperature batter stabilizer, and from 0.001–1.0% of a non-toxic, water-soluble polyvalent metal ion salt.

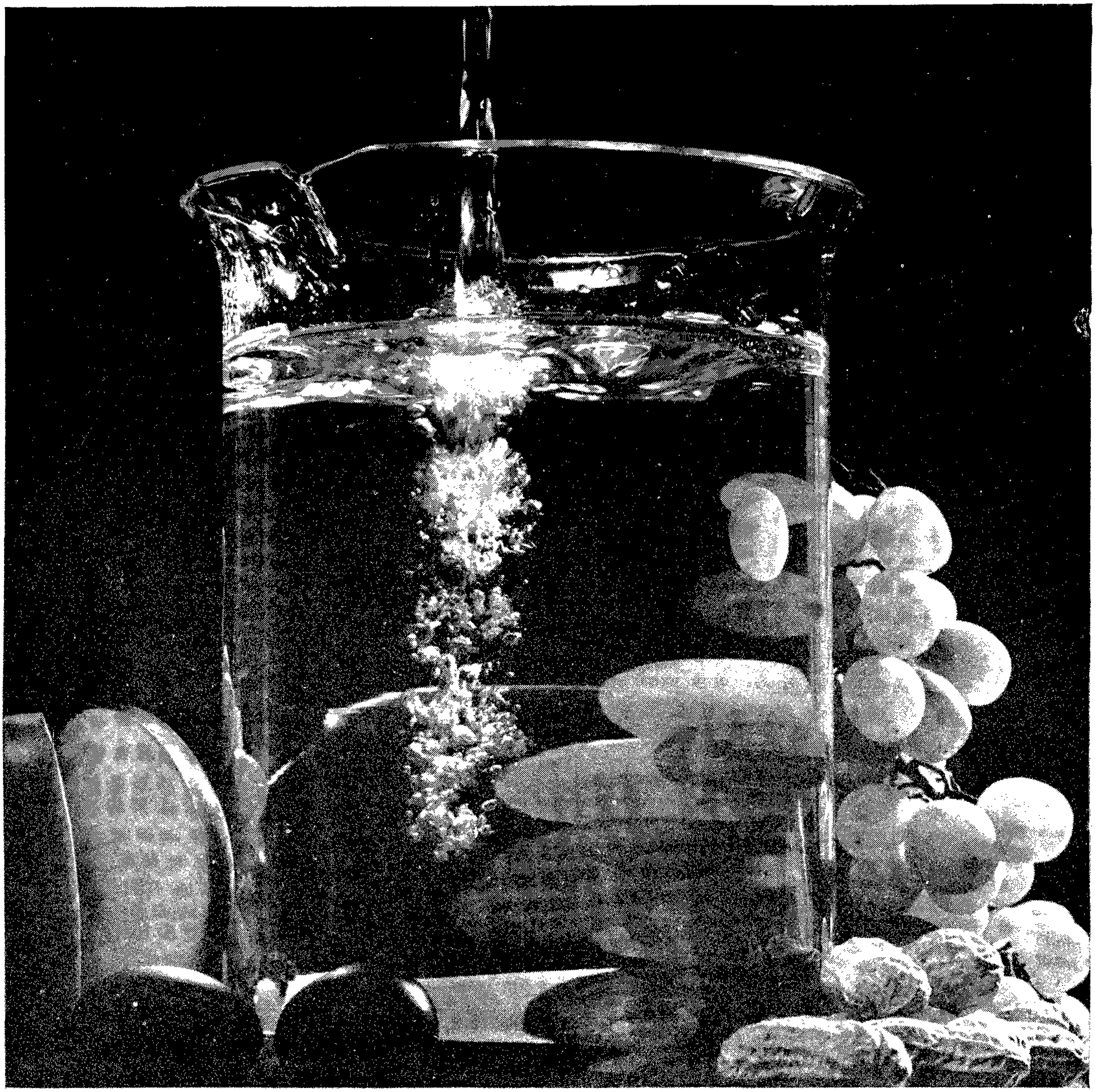
MARGARINE OIL AND MARGARINE MADE THEREFROM. V. K. Babayan and H. Lehman (Drew Chemical Corp.). *U.S. 3,268,340.* The major portion of a margarine oil composition consists of a rearranged mixture of 1–10 parts by weight of at least one lauric acid oil and 1 part of at least one non-lauric acid oil taken from the class consisting of corn, safflower, sesame, peanut, soy and cottonseed having a Wiley melting point of 73–80F. The minor portion of the margarine oil consists of 4–20% by weight of the composition of at least one hydrogenated lauric acid oil and from 3–6% of at least one additive taken from the class consisting of stearines and triglycerides of higher fatty acids having 16 or more carbon atoms and resembling tristearine in solid fat content. The margarine oil composition has a Wiley melting point of 84–102F.

SAFFLOWER OIL COMPOSITION. R. Erickson (A. C. Grace Co.). *U.S. 3,269,844.* The described composition consists of safflower oil, 1.2–1.5% by weight of glycerol mono- or dioleate, and 1.2–1.5% of a polyoxyethylene monooleate in which the glyceride of oleic acid and the polyoxyethylene monooleate are present in the ratio of 40-60 parts by weight of one to 60-40 parts by weight of the other.

PROCESS OF PREPARING STABLE TRIGLYCERIDES OF FAT FORMING ACIDS. Betty L. Bradshaw, R. O. Feuge and N. V. Lovegren (Sec'y. of Agr., U.S.A.). *U.S 3,270,040.* A process for converting a liquid mixture of fatty acid triglycerides in which at least 20 weight % of the triglycerides have an average chain length of the fatty acid groups of at least 12 carbon atoms, to the thermodynamically stable crystalline form comprises: subjecting the liquid mixture to extraordinary physical stress while maintaining the temperature with a range defined by a lower limit which is the melting point of the alpha crystalline form of the fatty acid triglycerides and an upper limit which is the melting point of the highest melting form.

LOW-TEMPERATURE RENDERING OF ANIMAL FATTY TISSUE. O. G. Artar, C. J. Filipowicz and J. C. Wilcox (Armour and Co.). *U.S. 3,270,041.* A low temperature rendering process for recovering substantially protein-free fat and highly stable protein-rich fat from animal tissue comprises the following steps: decreasing the particle size of the tissue and providing a flowable mass having a temperature between 65 and 80F; mechanically dislocating the fat from the proteinaceous material of the tissue by grinding the tissue between blunt surfaces to cause a temperature rise of no more than 10F and no less than 3F, while maintaining the temperature of the tissue between 79–85F; decreasing the viscosity of the ground mass of fat and protein by heating; and centrifuging to obtain a substantially protein-free and a protein-rich fraction having improved storage life while maintaining the temperature in the range of 92–100F.

CONTINUOUS BREAD MAKING PROCESS WITH NORMALLY LIQUID SHORTENING. P. M. Koren and F. R. Schwain (Procter & Gamble Co.). *U.S. 3,272,634.* The shortening in the described process comprises a suspension in a liquid glyceride vehicle of 6–14% by weight of shortening of substantially fully saturated fatty glyceride solids, having an iodine value not greater than 12, the solids consisting of 0.8–6.0% of monoglycerides of fatty acids having from 16–22 carbons, 0.0–6.0% of diglycerides of fatty acids having 16–22 carbons, and 2.0–8.0% of triglycerides of fatty acids having 16–22 carbons. The amount of shortening which is added at the first mixing stage is not less than 2.8%, based on weight of flour content in the dough.



## • Fatty Acid Derivatives

INTERCONVERSION OF FATTY ALDEHYDES AND DIMETHYL ACETALS AT LOW TEMPERATURES. V. Mahadevan, C. V. Viswanathan and W. O. Lundberg (Univ. of Minnesota, The Hormel Inst., Austin, Minn.). *Lipids* 1, 349–52 (1966). Facile procedures are described for nearly quantitative conversion of saturated and unsaturated fatty aldehydes to their dimethyl acetals, and vice versa, at low temperatures. The methods are based on the chemical behavior of aldehydes and dimethyl acetals in 100% sulfuric acid. Under the experimental conditions described, no side reactions seemed to occur. The purity of the aldehydes and dimethyl acetals was ascertained by thin-layer chromatography, infrared spectra and other techniques.

THE SYNTHESIS OF $^{14}C$- AND $^{3}H$-LABELED GLYCEROL ETHERS. E. O. Oswald, C. Piantadosi, C. E. Anderson and F. Snyder (The Med. Div., Oak Ridge Inst. of Nuclear Studies, Oak Ridge Assoc. Univ., Oak Ridge, Tenn.). *Lipids* 1, 241–46 (1966). The racemic $^{14}C$- and $^{3}H$-labeled alpha and beta derivatives of octadecyl glycerol ether (batyl alcohol) and of hexadecyl glycerol ether (chimyl alcohol) of high specific activity were synthesized by treating the appropriate alkyl halides with a large excess of the potassium salts of isopropylidene or benzylidene glycerol. By use of the trifluoroacetic anhydride esterification procedure, the labeled diesters of alpha and beta octadecyl and hexadecyl glycerol ethers were prepared. The labeled monoesters of beta octadecyl and of beta hexadecyl glycerol ethers were isolated from the reaction mixtures by silicic acid column chromatography.

PREPARATION OF SULFATE ESTERS. R. O. Mumma (Dept. of Biochem., The Pennsylvania State Univ., Univ. Park, Penna.) *Lipids* 1, 221–23 (1966). This communication reports a new method for the synthesis of sulfate esters, in good yield, under mild conditions. Sulfuric acid reacts with an alcohol and dicyclohexylcarbodiimide in a polar solvent to produce sulfate esters.

REACTIONS OF DIMETHYL SULFOXIDE WITH SULFONATE ESTERS OF FATTY ALCOHOLS. I. SYNTHESIS OF HIGHER SATURATED AND UNSATURATED FATTY ALDEHYDES. V. Mahadevan, F. Phillips and W. O. Lundberg (Univ. of Minnesota, The Hormel Inst., Austin, Minn.). *Lipids* 1, 183–87 (1966). Long-chain saturated fatty aldehydes ($C_{10}$ to $C_{18}$), as well as the $C_{18}$ unsaturated aldehydes (oleyl, linoleyl, and linolenyl), were synthesized in good yields by the selective oxidation of the sulfonate esters of the corresponding alcohols with dimethyl sulfoxide in the presence of sodium bicarbonate. Chromatographic procedures for the isolation of the pure aldehydes from the reaction mixtures are described. The purity of the aldehydes was ascertained by thin-layer chromatography, melting points of their 2,4-dinitrophenyl hydrazones, infrared spectra and other physical methods.

LONG-CHAIN FATTY ACIDS CONTAINING ETHER LINKAGE. I. THE ANTIBACTERIAL AND FUNGICIDAL ACTIVITIES OF SOME NEW β-ALKYLOXYPROPIONIC ACIDS AND THEIR METHYL ESTERS. Yoshiro Abe (Dept. of Applied Chem., Keio Univ., Koganei-shi, Tokyo, Japan). *Lipids* 1, 141–45 (1966). β-Alkoxypropionic acids and their methyl esters were made with alkoxy groups ranging from $C_4H_9O$ to $C_{18}H_{35}O$: $R\text{-}O\text{-}CH_2CH_2COOH(CH_3)$. Methyl esters and acids were also made with one and with two oxyethylene groups between the alkoxy group and the propionic acid group: $RO(CH_2\ CH_2\ O)n\text{-}CH_2\ CH_2\ COOH(CH_3)$. The compounds were tested against *Staphylococcus aureus* and against *Penicillium* for growth inhibition. The optimum size of the alkoxy group appears to be $R = C_{12}H_{25}$. Oxyethylene groups enhanced the activity against *S. aureus*, but had relatively little effect against *Penicillium.*

FATTY ACIDS AS SOURCES OF DICARBOXYLIC ACIDS. B. Sreenivasan (Res. Lab. Tata Oil Mills, Sewri, Bombay 33, India). *Indian Oil Soap J.* 31, No. 8, 234–243 (1966). A comprehensive review of the laboratory and commercial preparation of dicarboxylic acids.

STRUCTURAL EFFECTS OF ARYLSTEARIC ACIDS AS COMBINATION OXIDATION AND RUST INHIBITORS. J. L. Snead, J. Messina and H. Gisser (Frankford Arsenal, Phil., Pa.). *Ind. Eng. Chem. Product Res. Dev.* 5, 222–25 (1966). Effect of variation in molecular configuration of hydroxyarylstearic acids on effectiveness as combination oxidation and rust inhibitors in bis (2-ethylhexyl)sebacate was studied. Alkyl groups ortho and para to the hydroxyl of 9(or 10)-hydroxyarylsteraic acids enhanced oxidation protection but decreased rust protection somewhat. A second hydroxyl on the aryl ring, e.g. 9(or 10)-(2,3-dihydroxyphenyl)stearic acid, yielded still better oxidation protection, while 9,12-bis(4-hydroxyphenyl)stearic acid was the best antioxidant, of those studied, with only a slight compromise in rust protection. Alkaline earth soaps of the compounds were also effective combination inhibitors. The additives described are generally good antioxidants up to 175C, effectiveness decreasing with increasing temperature, and they provide adequate protection against rust.

COPOLYMERS OF EPOXY FATTY ESTERS AND/OR FATTY ALCOHOLS WITH $C_4$–$C_6$ LACTAMS. R. J. Johnson (Swift & Co.). *U.S. 3,269,965.* A method for preparing a hard resinous composition comprises: forming a mixture of an oxirane substituted higher fatty composition such as esters of epoxy fatty acids or alcohols and an amount of a lactam of 4–6 carbons sufficient to react with some, but not all, of the positions at a temperature of 50–400C to form a copolymer, and then further reacting the copolymer with an epoxy curing agent.

POLYMERIZATION OF UNSATURATED COMPOUNDS WITH AROMATIZED LINOLEIC ACID. M. E. Hannah, Jr. (Tenneco Chemicals Inc.). *U.S. 3,269,968.* In the production of linear polymers by polymerization of a water insoluble, unsaturated organic compound containing a $CH_2=C<$ group while dispersed in an aqueous medium in the presence of an emulsifying agent under polymerization as an emulsifying agent the sodium or potassium salt of aromatized linoleic acid.

## • Biochemistry and Nutrition

WATER-SOLUBLE PRODUCTS OF UV-IRRADIATED, AUTOXIDIZED LINOLEIC AND LINOLENIC ACIDS. N. Baker and L. Wilson (Veterans Admin. Center, Los Angeles, and Dept. of Biological Chem., UCLA Center for the Health Sci., Los Angeles, Calif.). *J. Lipid Res.* **7,** 341–8 (1966). The water-soluble products of the UV-initiated autoxidation of linoleic and linolenic acids emulsified in water were separated into volatile and relatively involatile components, each of which reacted with both thiobarbituric acid (TBA) and peroxidase. The volatile TBA-reactive compound is probably malonaldehyde and the volatile peroxidase-reactive compound is hydrogen peroxide. Additional compounds which absorb UV light were present in the volatile fraction. The mass of relatively involatile compounds was about 20 times greater than that predicted from either peroxidase or TBA assays of water extracts of oxidized linolenic acid. The properties of the water extract were similar to those shown by others for the products of prolonged autoxidation (without UV-irradiation) of emulsified methyl linoleate.

WATER-SOLUBLE INHIBITOR(S) OF TUMOR RESPIRATION FORMED FROM ULTRAVIOLET-INDUCED OXIDATION OF LINOLEIC AND LINOLENIC ACIDS. *Ibid.*, 349–56. Inhibition of Ehrlich ascites carcinoma respiration by aqueous extracts of oxidized linoleic or linolenic acid (aqueous emulsions UV-irradiated, 90 min) was associated entirely with relatively involatile compounds which were both thiobarbituric acid (TBA)-reactive and peroxidase-reactive. Inhibitory compounds were heat stable and migrated in thin-layer chromatography with aldehydes, "hydroperoxides," and TBA-reactive compounds. Peroxidase-catalyzed reduction of the "hydroperoxide" diminished the inhibition. At least 12 compounds (approximate chain length, 7C to 13C) containing $\alpha,\beta$-unsaturated carbonyl groups were isolated by gas-liquid chromatography (GLC) of dried extracts of oxidized linolenic acid. No single fraction inhibited tumor respiration, but the recombined mixture of all compounds caused complete respiratory inhibition of ascites tumor cells. Less material was required to inhibit oxygen consumption before than after GLC presumably because the more highly inhibitory components of the extract (along with "hyperperoxides" and TBA-reactive compounds) were lost during GLC. Extracts from oxidized linolenic acid were found to produce in all tumor cells cytoplasmic evaginations which were readily detected by phase microscopy.

ABNORMAL GANGLIOSIDES IN TAY-SACHS DISEASE, NIEMANN-PICK'S DISEASE AND GARGOYLISM. D. A. Booth, H. Goodwin and J. N. Cumings (Inst. of Neurology, The National Hosp., Queen Square, London, England). *J. Lipid Res.* **7,** 337–40 (1966). The molar ratios of N-acetyl neuraminic acid, hexose, hexosamine and sphingosine have been determined for the abnormal ganglioside in Tay-Sachs disease that was previously detected as a fast-moving band in thin-layer chromatography, and in two abnormal fast-moving bands of gangliosides from the cortex and white matter of the brain in cases of gargoylism

(Continued on page 532A)

Guests at Kentucky Breakfast enjoy traditional Kentucky breakfast.

(Continued from page 494A)

## Members Attend Sessions of Choice

The technical sessions got under way Monday morning immediately after the General Assembly, with three outstanding symposia: Oil and Seeds, Flotation, and Medium Chain Glycerides. Later that afternoon, three new symposia began: Soap Bacteriostats, Odors and Flavors, and Chemistry and Structure of Lipoproteins. (The Odors and Flavors symposium is reviewed on page 498A, this issue.)

Monday also found AOCS members with multiple committee assignments busy trying to fit into their schedules the important meetings on Hydrogenation of Oils, Feed Grade Fats, Safflower Seed Analysis, Antioxidants, Fatty Nitrogen, Drying Oils, Epoxidized Oils, Membership, Advertising, Education and Instrumental Techniques.

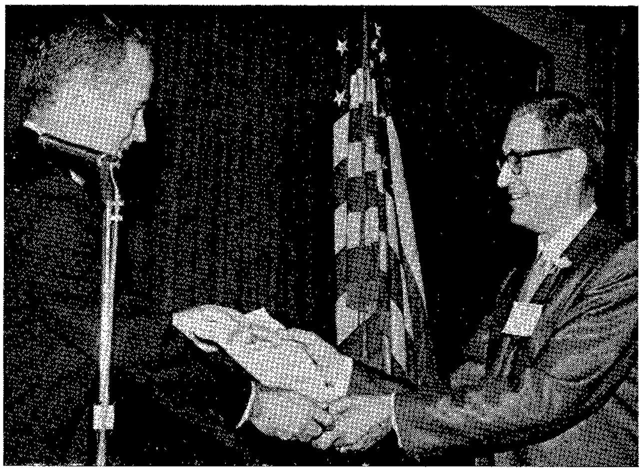
## DPI-ECPI Reception Highlights Monday Social Events

The annual reception sponsored by Distillation Products Industries and Eastman Chemical Products, Inc., always a distinguished feature of AOCS meetings, clearly maintained its tradition of hospitality in spite of the adverse conditions resulting from the strike. Members of the DPI and ECPI firms joined forces with members of the hotel administrative staff and tireless committeemen in serving the guests, and were easily spotted in the crowd with their white boutonnieres.

An unusually attractive selection of appetizers, crowned by two great heads of cheese, fell victim to the hundreds of registrants who had just completed a long and satisfying day. Needless to say, there was no lack of interesting things to discuss at this, certainly one of the most eventful of AOCS meetings.

General Chairman A. N. Wrigley spoke briefly to the crowd of his colleagues, announcing necessary adjustments in sessions, social events, and Ladies' Program. His efforts to apologize for any inconvenience being suffered by registrants were answered by an ovation that must have warmed his heart. It was quite clear, here at the DPI-ECPI Party as well as elsewhere during the meeting, that unanticipated and uncontrollable difficulties which might be expected to dampen the spirits of a less interested group, had only served to sharpen the appreciation for the efforts of a gallant committee.

Stringed Band Entertainers.



N. T. Joyner gives C. W. Hoerr his commission as a "Kentucky Colonel" at the Girdler-Votator Kentucky Breakfast.

## Kentucky Breakfast Tradition Continued

The Kentucky Breakfast plans also underwent a few minor changes in overall arrangements, but the shift to a restaurant outside the hotel affected neither the menu nor the atmosphere of fine southern hospitality. This breakfast, a tradition with Girdler Catalysts and Votator Divisions of the Chemetron Corporation, features home-cured Kentucky hams, flown in especially for the occasion. (They may have been flown in to Philadelphia, but they were trundled from the Bellevue-Stratford to Kugler's Restaurant by more old-fashioned methods: volunteers loaded the hams—delicacies in flavor but definitely not in weight—onto hand trucks and delivered them several blocks away to the Kugler chefs.)

Highlighting the occasion, as always, was the presentation of the Kentucky Colonel Commission to President Hoerr. The Commission was conferred by N. T. Joyner, Executive Vice President, Votator Division, Chemetron Corporation.

## Tuesday's Technical Sessions

Tuesday's technical sessions introduced the Symposium on Process Engineering led by R. H. Potts. The Symposium on Odors and Flavors continued throughout the day while sessions on Detergent Evaluation Methods, Chemical Modifications and Derivatives, and Triglycerides were also held. Tuesday was also a busy day for committee conferences

Annual Banquet at Kugler's Restaurant.

**Head Table at Banquet, clockwise: George Rouser, A. R. Baldwin, Arthur Rose, Mrs. H. E. Carter, C. W. Hoerr, W. O. Lundberg, Mrs. Rose, H. E. Carter, Mrs. Hoerr, Raymond Reiser.**

which included Dibasic Acids, Oxygen Bomb, Uniform Methods, Commercial Fatty Acids, Polymerized Acids and National Programming and Planning.

## A Banquet To Be Remembered—and the Lipid Award

With the strike still in force, it was necessary to change Tuesday evening's Annual Banquet from the hotel to Kugler's Restaurant also. Nearly 800 superb filet mignon dinners were served on relatively short notice, with a fine complementary wine.

After the dinner, C. W. Hoerr introduced Arthur Rose, President of Applied Science Laboratories. Dr. Rose conferred the third AOCS Award in Lipid Chemistry to H. E. Carter of the University of Illinois for his research in antibiotic chemistry and the biochemistry of complex lipids. The full text of Dr. Rose's remarks is to be found in this issue of *JAOCS,* page 492A.

Upon receiving the Award, Dr. Carter observed that lipid chemistry is "coming of age." His AOCS colleagues obviously feel that he has done a great deal to speed the maturation process. The Award gives formal recognition to his work as a scientist, an educator, an administrator, and an important contributor to the activities of numerous scientific societies. Dr. Carter is head of the internationally recognized department of chemistry at the University of Illinois.

## String Band Provides Unique Entertainment

For the evening's entertainment, Frank Scholnick called upon Charles Gresh and his orchestra. Then the Quaker City String Band marched out in very colorful costumes and gave several enjoyable moments of string band music that only Philadelphia has to offer—a display that will be remembered by all. Next, comedian Will Jordan took over and kept the crowd roaring with his personal imitations of movie stars. Before the audience could catch its breath, pop singer Trude Adams was in command, her beautiful voice capturing full attention. But at that moment, things began to go wrong; first, a blown amplifier fuse. With the ingenious mind of a restaurant employee, the entertainment was continued by replacing the fuse with some aluminum foil from a cigarette package. A few songs later, smoke began pouring from the amplifier and a transformer burned up before the electricity could be disconnected. But—never say die—with a replacement amplifier, dancing and singing were enjoyed until midnight.

## Wednesday Concludes Sessions

Wednesday's activities were highlighted by sessions on general analytical procedures, biochemistry, computer applications, and several general papers. With the reading of the 118th paper at 3:20 p.m., a very full and rewarding technical program came to a close, concluding an unusual—but very successful—meeting. Soon after everyone had departed for their homeward destinations, the strike was settled, and Philadelphia hotel life returned to normal. Alas!

## While the Men Were Busy . . . .

A busy and colorful program was planned for the ladies during the hours while their husbands were attending the technical sessions. Bright and early Monday morning following breakfast, the ladies boarded buses for a trip to Longwood Gardens where they enjoyed a conducted tour of this landmark on the du Pont Estate. On the return trip the buses stopped at the Red Rose Inn. A most delicious and filling lunch was enjoyed by all in the colonial atmosphere in the Inn which has been serving travelers on the Baltimore Pike since 1740. That evening husbands, wives, and friends socialized at the reception sponsored by Distillation Products Industries and Eastman Chemical Products, Inc.

**Ladies' Continental Breakfast.**

The feature activity Tuesday morning was a bus tour through historic Philadelphia. There were several stops to give the ladies a close look at the Liberty Bell, a rooftop view of "The Most Historic Square Mile in America" from atop the Penn Mutual Life Insurance Company Building, a tour through Betsy Ross' House, and a guided tour of the Powel House. Following the tour, an appropriate seafood luncheon was served at the Old Original Bookbinders Restaurant. That evening everyone was dressed in their finest attire for the Annual Fall Banquet.

Wednesday morning while the technical sessions were concluding, the ladies who were interested went on a tour of the Philadelphia Art Museum.

Despite the problems created by the strike, it is hoped by the Ladies Committee that all of the wives who accompanied their husbands went home with many pleasant memories of their visit to Philadelphia in October, 1966.

## To Those of the Various Committees

Special thanks is given to all committees for doing an excellent job of providing registrants with the best in technical papers, exhibits, accommodations and entertainment. A. N. Wrigley as General Chairman selected a fine group of hard-working people, and W. C. Ault arranged an excellent Technical Program. Others who made this a successful Fall Meeting are Mrs. Abner Eisner, Ladies' Committee; F. G. Shea, Exhibits; Frank Scholnick, Entertainment; E. J. Saggese, Hotel; F. E. Luddy, Registration; G. A. Jacobson and Gerhard Maerker, Finance; T. H. Smouse, Publicity; and J. A. Kirkpatrick, Printing. General Advisors were Frank Naughton and A. M. Rossetto.

The hard work of all these people and those on their committees made a highly successful meeting which will be remembered by all. Our thoughts now turn toward the 1967 Spring Meeting at New Orleans.

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## • *Rose Address*

(Continued from page 492A)

vibrantly active area of biochemistry and physiological chemistry. It is appropriate that the AOCS be an active factor in this development through an award and a publication program.

Dr. Carter, famous and distinguished Lipid Chemist and scientific leader, and Herb, my good friend and co-worker, on behalf of all fifty-odd members of the staff of Applied Science Laboratories, Inc., I take pleasure in presenting you this $2500 check as the financial part of the 1966 AOCS Award in Lipid Chemistry. I do this in recognition of your major past accomplishments and in certain knowledge of other contributions to come. I congratulate you.