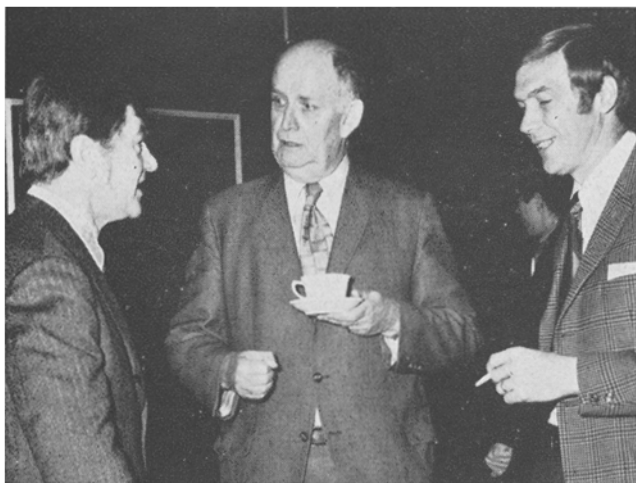


# North Central Section More Than

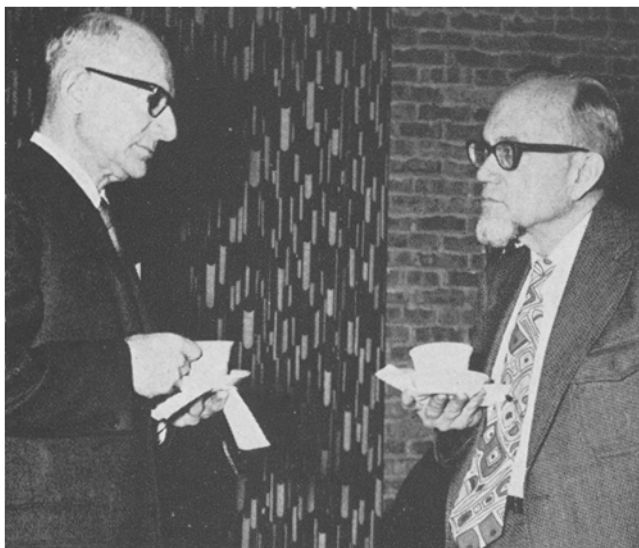
A one day symposium organized by R. Krishnamurthy, Program Chairman of the AOCS North Central Section, was held at Josef's Restaurant in Hillside, Illinois, on January 26, 1972. The all day session was attended by more than 60 people.

The first speaker was H.M. Rieman of Stauffer Chemical Co., and his topic was "Phosphate Applications in Foods." The uses of phosphates were covered in four general areas. The first area was in cereal and cereal applications where phosphates are used as a leavening agent. Various types of phosphate were covered along with their ability to induce the release of CO<sub>2</sub> at different rates. The buffering capacity of phosphates for uses in quick cooking cereal and pasta products where the gelatinizing point is lowered through this use was also discussed. The second area of phosphate use was in the dairy area. Phosphate uses in evaporated milk, processed cheese, soft ice cream and milk gels were discussed. The third area of discussion included the use of phosphates in fruits, vegetables and eggs, where phosphates are used to remove pectin from fruits, prevent blocking of potato products and condition eggs for processing. Rieman concluded with discussion of the use of phosphates in meats with emphasis on moisture retention and increased yields in ham products and comminuted meat systems.

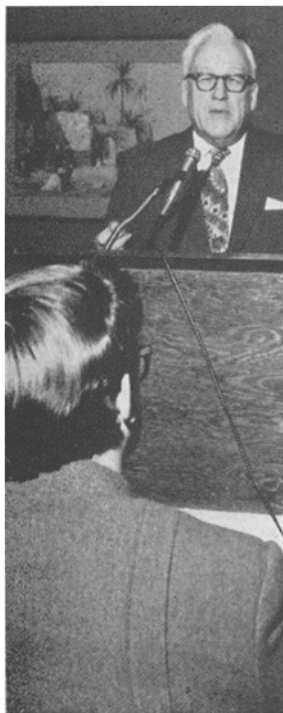
The next speaker was J.B. Stine of Kraftco. Stine is Advisor to the U.S. Delegation for the Codex Alimentarius and his topic was appropriately titled "Codex Alimentarius—What it Means to U.S." Stine gave the chronological development of the Codex Alimentarius and explained the various groups, committees, factions, and their responsibilities. Many questions were asked by the audience as to the U.S. position on standards set by the Codex and the methods by which standards are set. On the first point Stine indicated that the FDA stand is that "we will conform as much as possible." As far as standards there are three possible approaches to acceptance: (a) blanket adoption of standards; (b) adoption of standard with *minor deviation*; and (c) target standard, where a standard will be met by a specified time. Stine pointed out that the food additive field poses the most difficulty to the U.S.



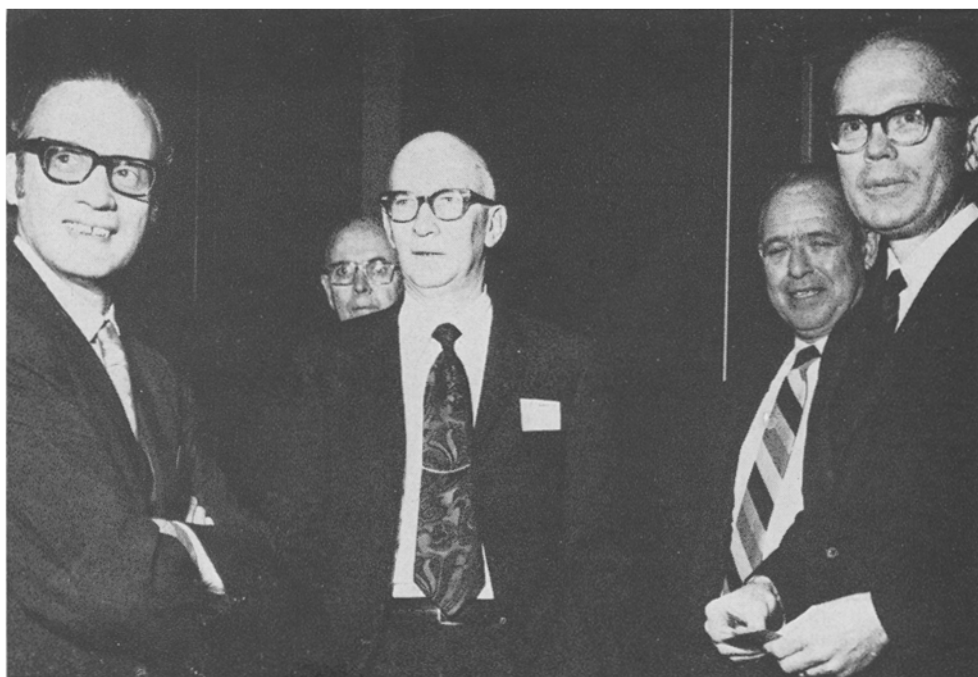
D. Sincroft, J.B. Stine and L.D. Williams.



H. Black and J.C. Cowan.



H.J. Dutton.



A. Firestone, L.E. Gast, R. Scholfield and F.H. Pryde.

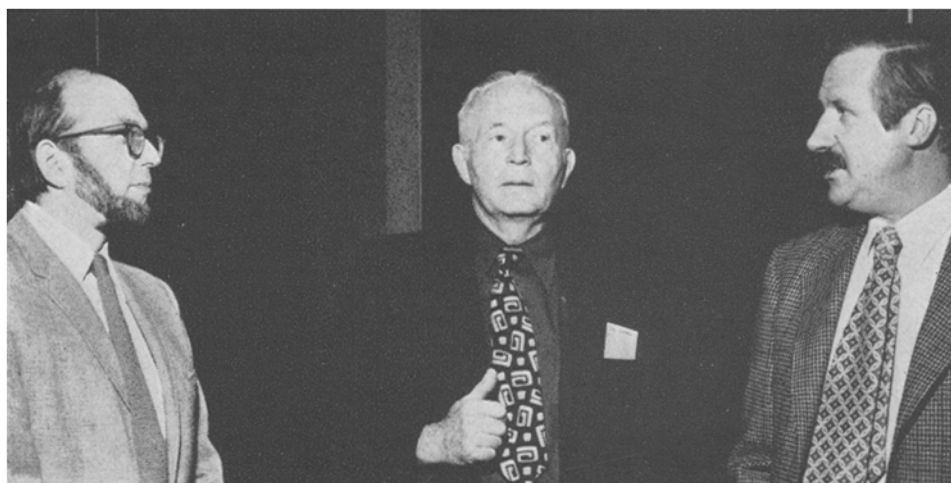
# Symposium Draws 60 Participants

After the first coffee breaks, E.S. Lutton of Procter & Gamble Co. spoke on the "Physical Properties of Triglycerides—Retrospect and Prospect." Lutton discussed the classical theories on triglycerides' physical properties as related to chain lengths on fatty acid position on the glyceride molecule. Lutton approached this broad area by first describing the crystal behavior of pure triglycerides, such as tristearin and tripalmitin before proceeding to mixed triglycerides and the polymorphic behavior of mixed fat systems. In his presentation he explained the X-ray crystallization and IR techniques that were used to support the hypothesis on polymorphic states of triglycerides. He also described the relationship between dilatometer behavior and triglyceride structure as well as the effect of structure on the tempering of fats, nucleation phenomena and surface film on water. Lutton's prospects for the future work in Fats and Oil chemistry covers some 16 different areas which he listed in order of importance. Some of them were as follows: the preliminary work on beta prime structure should be brought to a point comparable to that of the beta form; the conditions of tristearin structure with that of known tricaproin and trilaurin should be

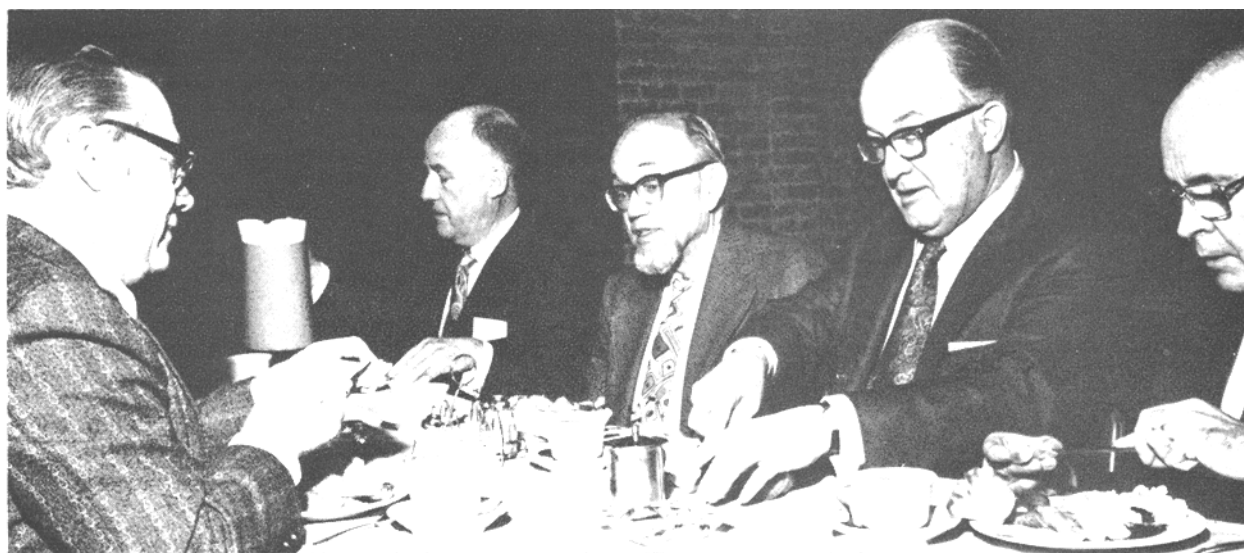
(Continued on page 114A)



F.A. Norris and C.A. Overley.



E. Snyder, E.S. Lutton and L. Wiederman.



R.B. Thompson, J.C. Cowan, F.A. Norris and C.A. Overley.

## • North Central Section Holds Symposium . . .



F.A. Norris, H.J. Dutton, L.D. Metcalf, G. Lichtenwaller and B. Bushwell.



H.H. Rieman.

(Continued from page 113A)

fully established; detailed structure of mixed  $C_{16}$  and  $C_{18}$  triglycerides must be explored; a thorough examination of fat bloom should be made; investigate the arrangement of molecules on the surface of beta crystals should be investigated; more work on the beta 3 structure must be done; and the extent of occurrence of optical isomer of natural triglycerides should be determined. These were just a sampling of Lutton's suggestions that insures that "there is a place in this emotionally ecological, relevance ridden, and scientifically satiated world for fat and physical chemistry."

The fourth paper entitled "Selectivity of Copper-containing Hydrogenation Catalysts" was presented by H.J. Dutton of the Northern Regional Research Laboratories, Peoria, Ill. Dutton presented data from radioisotope experiments which elucidate the selective mechanism of hydrogenation for copper-containing catalyst. It was pointed out that the conjugation of the double bonds is an obligate step for the hydrogenation process. Through the use of mass spectrometry and deuterium gas it was observed that hydrogen from the fatty acids is constantly being adsorbed and described on the catalysts surface and the major portion of the reduced fatty acids contained no deuterium at all. Another interesting phenomenon was the continual shifting of the deuterium up and down the fatty acid chain from the  $\Delta 9-10$  to the  $\Delta 3-4$  and  $\Delta 15-16$  position. More on the deuterium experiment was that deuterium appeared

to be pushed to the extreme end ( $\Delta 17-18$ ) of the molecule in the cis fatty acids. These experiments reinforced the fact that isomerization occurs very readily with copper catalysts. However Dutton pointed out that only 20% of the 18:2 fatty acid was isomerized and are the same types found in nickel reduced oils. The interest of course in the copper catalyst is its ability to reduce 18:3 content in an oil without increasing the level of 18:0. The audience expressed their concern for the high ratio of isomerization with copper catalysts that may affect nutrition. Dutton said that this point is now under investigation by way of biological studies on transport through the placental membrane. One other question raised was the reuse of such a catalyst and the answer was 2-2½ times.

David Firestone of the FDA, Washington, D.C., was the fifth speaker of the day. His topic was "Lipoxidase Method for *Cis-Cis* Polyunsaturated Fatty Acids—A Collaborative Study." This study was carried out under the auspices of the Association of Official Agricultural Chemists. The theory of the enzymatic method was presented and the specific procedure used. The method is based on the soybean lipoxidase catalyzed conversion at pH 9 of naturally occurring *cis-cis* methylene interrupted polyunsaturated fatty acids to *cis-trans* conjugated hydroperoxide that adsorbs at 234 nm. Fifteen collaborative laboratories were involved in this investigation and 5 out of the 15 were consistently off on values reported for the enzymatic method. The reproducibility of the method was discussed, as well as the results from the different oils used. It was concluded that earlier steps in the method produce more of the differences or error than the determinative steps. The collaborators made many suggestions for improving the procedure. Some of the audience suggested that a gas liquid chromatography method be used. Firestone asked: "Have many in the audience had capillary gas liquid chromatography available and of these two who would sponsor a collaborative for comparing these two methods?" From the negative response of the audience, Firestone made his point on the difficulty of conducting a collaborative study. A final question was raised as to the status of this method as far as acceptance and the enforcement of labeling declarations. Firestone replied that the collaborative is under review by the proper authorities and no decision of label declaration has been made.

The sixth and final speaker of the symposium was H.F. Reid of the W.R. Grace & Co. and his topic was "Ester-based Synthetic Lubricants—Properties and Performance." Reid presented a very interesting story on the high and low temperature properties of various ester-based lubricants and their role in future systems requiring lubricants. Diesters and polyol esters are the least expensive and have the most potential for the future. Some examples were dioctylsebacate. The sebacic acid can be replaced by azelaic and adipic acids while the esterifying alcohol can vary in chain length. As for the polyol esters, an example was trimethylpropanetrivalerate. Usually mixed acids are used rather than pure valerate. Capric acid is the most widely used today. Long chain acids present low temperature

(Continued on page 115A)



Left to right: H.F. Reid and R. Krishnamurthy.

# Prominent Lipid Chemist Dies in Cologne

Professor Ernst Klenk, renowned lipid chemist, died December 29, 1971, in Cologne. Professor Klenk, who had just entered his 75th year, is survived by his wife, Dr. Margarete Klenk, and three sons.



**Ernst Klenk**

Klenk was born October 14, 1896, in Pfalzengrafenweiler, Germany. Following World War I, he became a resident of Tübingen, where he joined the Institute of Physiological Chemistry. After earning his doctorate from the University of Tübingen in 1923, he worked with Professors Thierfelder and Knoop. In 1936 he was awarded a personal professorship in physiological chemistry at the University of Cologne, where he served as dean of the medical faculty from 1947-48 and rector of the University from 1961-62. Until his retirement in 1967, Professor Klenk headed the Department of Physiological Chemistry of the University of Cologne. He became an AOCS member in 1965 and received the AOCS Award in Lipid Chemistry during that same year.

Professor Klenk was a pioneer in the general methodology of fatty acid metabolism, and a forerunner in the use of column chromatography prior to the advent of gas liquid chromatography. He demonstrated the existence of families of fatty acids and deduced much about their metabolic interrelationships, concentrating on the polyunsaturated and essential fatty acids. Klenk's studies covered plants, higher animals and fish, with remarkably accurate results, in spite of problems of methodology in an area which was entirely new at the time he began his research.

Klenk was first to demonstrate the presence of inositol-containing lipids (the inositol phosphatides) in soybean lipid extracts. One of his most outstanding achievements was the discovery of the important class of brain lipids, the gangliosides. He succeeded in isolating one of the gangliosides in crystalline form from brain lipid extracts, and demonstrated that gangliosides were markedly elevated in Tay-Sachs disease (an inherited and fatal disease in infants leading to complete failure of brain development and function).

Professor Klenk also discovered that sphingomyelin is elevated in the brain and other organs in Niemann-Pick disease, another inherited metabolic disease of children. This demonstration brought the total of such diseases known to involve lipids to three (two were discovered by Klenk and one, Gaucher's disease, had been discovered many years earlier). Only within the past four years has another disease, metachromatic leucodystrophy, been added to this list.

Professor Klenk's most recent work related to unsaturated fatty acids.

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## • North Central Section . . .

(Continued from page 114A)

problems. Reid projected the usage of synthetic ester-based lubricants by 1975 and feels that there will be a small per cent, but volume-wise a substantial portion of the market open for these particular lubricants. Reid charged the fats and oils industry with producing the fatty materials for this potentially lucrative area.

The seventh scheduled speaker of the day, W.B. Papagorge of Monsanto was unable to present his paper on "PCBS—Present and Future."

The next meeting for the North Central Section will be the Bailey Awards Dinner presentation on March 22, 1972, at Josef's Restaurant in Hillside, Illinois. The 12th Alton E. Bailey Award will be presented to Ralph T. Holman of the Hormel Institute, University of Minnesota, Austin, for his research contributions to the better understanding of the nutrition of fatty acids and the dietary importance of polyunsaturated fatty acids. Holman will present some of his work in his talk entitled "Nutrition and the Metabolism of Polyunsaturated Fatty Acids."

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