erol, he pointed out, not many important organic chemicals have been produced from fats.

In enumerating important possible uses for fats and their products, the speaker gave particular attention to the "industrially pure" fatty acids, those which contain more than 90% of a single chemical component. The industrial methods for achieving this purity, he related, are three in number: low-temperature solvent crystallization, selective hydrogenation of the polyunsaturated components of glycerides, and polymerization of the high linoleic fractions followed by distillation of the volatile monomeric acids.

Dr. Swern pointed to a great variety of uses for the pure fatty acids, particularly through their conversion to nitriles, amines, amides, and esters.

A recent use for fats which recently has achieved importance, reported Dr. Swern, is the stabilization of certain resins through the use of epoxidized oils and animal fat esters. These compounds take up the hydrogen chloride given off by decomposition of polyvinyl chloride and thus prevent accelerating degradation of the polymer. The dimer acids from linoleic acid are the base for certain polyamide resins used in coatings. The acetoglycerines made, for example, by the acetylation of monoglycerides, are finding considerable use in food coating. Azelaic and pelargonic acids now are being manufactured by the splitting of oleic acid, said the speaker. A plant carrying out that reaction is now using the world's largest ozonizer, he said.

Interesterification. A very real potential exists for the industrial application of interesterification, according to L. I. Hansen and N. W. Formo, Archer-Daniels-Midland Co. This process, which involves interchange of the acid radicals of glycerides through hydrolysis and re-esterification, can give, as the ultimate, a statistical orientation of the acid portions of the molecules. It is now possible to unbalance the equilibrium, said Dr. Formo, to give a nonstatistical orientation. This is done either by chilling during the process to solidify certain of the higher melting acid components, or by distilling off the more readily volatile acids as they hydrolyze.

The speaker reported that interesterification now is being used to improve the plasticity of lard. It was used at some periods during the war to make a tung oil–soybean oil combination with particularly desirable film characteristics, but the practicality of that depends heavily on economics. He suggested that interesterification holds good possibilities for the upgrading of drying oils.

Edible Fats. John Cowan, Northern Regional Laboratory, USDA, in reviewing progress in research on the flavor stability of soybean oil, said that linolenic acid definitely has been shown to be a precursor in the flavor reversion of fatty acids. Other factors may enter, he said, and not all of these are understood.

Dr. Cowan noted that the use of soybean oil for food purposes has increased from 900 million to 1900 million pounds during the past 20 years. There was inference that progress against flavor reversion problems is likely to mean a considerable further increase.

Lipoxidase is a factor to be reckoned with in foods containing unsaturated fatty acids, according to Marian Kies of the National Science Foundation, but that enzyme has a rather limited distribution. It may not be of prime importance in fat deterioration, but it must be taken into consideration in food studies.

Antioxidants. A number of compounds have been studied as antioxidants for fats, it was reported in a review by H. R. Kraybill and L. R. Dugan, Jr., of the American Meat Institute Foundation. Synthetic products have been found to have qualities superior to the natural in carrying through the baking or frying process, he said. There is now an increase in the use of such materials in packages for fats or food containing fats, the speaker said.

A Nutrition Education Foundation

Adult dietary habits are causing the greatest furor that this nation has known over the matter in a generation, declared H. E. Robinson, Swift and Co., before the luncheon of the Division of Agricultural and Food Chemistry.

There can be little doubt, he told the group, that the reducing craze will have a tremendous effect on the per capita intake of foods which are primarily fatty in nature. Furthermore, it now seems possible that the use of potatoes, bread, and cereals crops may drop at an increasing rate in the next year or two.

Dr. Robinson said that all segments of the food industry should be giving attention to this latest of nutrition fads. If properly carried out, he suggested, it could be a wonderful thing. But a strong educational job is needed, it was emphasized, on common sense reducing diets which do not lose nutritional balance through the elimination of certain necessary food elements. In view of the need for the right kind of nutrition education, Dr. Robinson suggested that it might be sound endeavor for the food industry to form a nutritional educational foundation, conducted along the same lines of high policy set by the Nutrition Foundation.

Dr. George D. Scarseth of the American Farm Research Association relates his experiences of limiting factors in agricultural production at the Division of Fertilizer and Soil Chemistry luncheon

Crop Rotations No Longer Necessary, Scarseth Believes

"Agricultural scientists are slow or hesitant to express their more advanced thoughts," said George D. Scarseth of American Farm Research Association, at the Division of Fertilizer and Soil Chemistry luncheon. "We tend to miss the rich margins of a scientist's mind when he publishes only his proved work," he added. According to Dr. Scarseth, the imagination the scientist draws on in speculative thinking before experimenting can be most stimulating to another scientist. He believes that since the agricultural scientific field has such a vast audience of laymen, the agricultural scientist has not been as free to use and express hypotheses and theory as have the astronomer, physicist, and chemist.

"I claim no priority to the hypothesis that I am about to suggest today, but am willing to accept the blame for all," said Dr. Scarseth.

Crop rotations are no longer necessary. This is hardly proved true as yet, but facts point to a hypothesis that says it may work. To illustrate this point he cited the case of the middlewestern farmer who can't afford to grow oats. He does not need them for the straw for bedding or for the legume nurse crop. Other crops can do these tasks more economically. Neither can he afford to grow his old standby, red clover. He can get both nitrogen and organic matter cheaper from synthetic nitrogen and nonlegume higher value crops, if he likes. As a forage crop, alfalfa is better.

Dr. Scarseth has the hypothesis that in fertilizing corn in the North, the greater share of the applied nitrogen should be placed as an ammonia carrier deep under the row, with a starter fertilizer near the seed at planting and the greater bulk of the potash applied broadcast a previous year. He said that although proof of this theory does not exist, certain isolated facts support it. He believes, "We cultivate too much. Saving in expensive labor and power, and gains in conservation of the soil make this attractive, but proof of adequate substitutes is needed —perhaps overdue."

Another problem which Dr. Scarseth believes has not enjoyed sufficient speculative discussion is that of nematodes as a limiting factor to the most effective use of fertilizers. He suggested that perhaps nematodes are responsible for much poor growth attributed to impoverished soils.

Northern farmers are losing a big natural resource of daylight by letting much of the long daylight of spring to June 21 go to waste. Dr. Scarseth predicted the natural forage area of our approaching scientific age will be in the South, where there are more growing winter days than in the North and where rainfall is above 40 inches per year.

There is no end to this type of guessing. As a hypothesis, these statements are justified. Proof perhaps will await the future.

Sugar Chemists Achieve Two Biochemically Important Syntheses

First authentic chemical synthesis of sucrose . . . Practical preparation of desoxyribose from glucose . . . George P. Meade is named "chemist of the year" by carbohydrate division

CHICAGO.—A chemical synthesis of sugar that can provide biochemists with means of tracing the path of the sugar molecule in life processes has been successfully conducted by Raymond U. Lemieux and George Huber of the National Research Council of Canada. Dr. Lemieux reported the results of their work, which they believe will make the synthesis of many complicated substances a matter of easy routine, in a paper presented to the carbohydrate division at the 124th American Chemical Society meeting here.

In the course of fundamental research studies on the chemical properties of sugar the authors gathered data from many scattered sources, and their findings suggested to them that the reactions of Brigl's anhydride at elevated temperatures might hold the key to a synthesis of sugar. A successful synthesis of maltose strengthened this opinion, and sucrose in crystalline form was finally produced (about 1% yield) by reaction of a sirupy 1,3,4,6-tetra-Q-acetyl-D-fructofuranose with Brigl's anhydride, followed by acetylation and extraction of the material from a benzene solution. The product of the synthesis possesses an infrared spectrum identical to that of sucrose octaacetate measured under the same conditions.

All previous attempts to solve this classic problem in carbohydrate chemistry have failed. In 1928 Pictet and Vogel claimed a chemical synthesis, but their method was not reproducible. However, in 1944, Hassid, Doudoroff, and Barker, working at the University of California on methods of sugar production in living cells in plants produced disaccharide sucrose in and enzymatic synthesis using the microorganism *Sacchrophila*.

Desoxyribose from Glucose

2-Desoxy-D-ribose has remained for years a rare and unobtainable sugar in spite of a lively interest in the nucleic acids and their possible relationship to such important phenomena as the mechanism of inheritance, growth and development, and normal versus abnormal growth. Several synthetic routes to 2-desoxyribose have been recorded, but the methods have been tedious and expensive, and it has been difficult to obtain even experimental quantities of the sugar. John W. Sowden of Washington University, St. Louis, Mo., reporting a simple and economical synthesis of deoxyribose, told the audience that the clue to the synthesis was based on the observations of Nef who reported in 1910 that although cold dilute alkali and a reducing sugar give an extremely complicated and uninviting mixture of products, hot concentrated alkali gives a relatively small number of main products that are practically all acidic in nature.

D-Glucose, the starting material for Sowden's synthesis, and concentrated sodium hydroxide in warm solutions are mixed so that the resulting solution is about $8N$ in sodium hydroxide and about 10% by weight in glucose. This solution is heated for about 8 hours at 100° under an atmosphere of nitrogen in order to avoid air oxidation. It is then cooled, ice is added, and sufficient concentrated hydrochloric acid to neutralize the sodium hydroxide. The solution is concentrated and the mixture of saccharinic acids is extracted with cold ethanol. The residual sirup is then oxidized with hydrogen peroxide in the presence of ferric acetate as in the Ruff degradation. The solution is deionized, concentrated, and treated with benzylphenylhydrazine, and from 10 to 12 grams (per 100 grams of glucose) of crystalline benzylphenylhydrazone of 2-desoxyribose is obtained. The hydrazone is readily purified and cleaved with benzaldehyde to give pure crystalline 2-desoxyribose.

George P. Meade of Colonial Sugar (left) receives the commemorative scroll naming him the carbohydrate division's "chemist of the year" from Thomas R. Gillett of California & Hawaiian Sugar, chairman of the division. Looking on is Nelson K. Richtmyer of NIH, chairman-elect of the division