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