same. A greater difference in the solubilities between the two phases would probably occur if dilute solutions were employed. Crystallization from dilute solution can be brought about by the addition of foreign substances and by the use of low temperatures.

The considerations I have brought forward urge the study of the fractional crystallization of the rare earths, especially their unsolvated ions, at as low a temperature as possible. Perhaps fractionation from alcohol near the freezing point should be attempted first. It may happen at this temperature, if the complete difference in the ionic radii is utilized, that two phases (if the mixture consists of two rare earths) will crystallize out of solution each of which contains one of the rare earths predominantly. Possibly this temperature is not yet low enough. Data alone can give the answer.

CATTOLICA-SAN GIOVANNI SIMON FREED
ITALY [Fellow of the John Simon Guggenheim Memorial Foundation]
RECEIVED AUGUST 25, 1931
PUBLISHED OCTOBER 5, 1931

---

## SYNTHETIC CELLULOSE AND TEXTILE FIBERS FROM GLUCOSE

*Sir:*

A chemical investigation of the structure of the membrane obtained by the action of *Acetobacter xylinum* on glucose has now established the identity of the product as a true cellulose. Hydrolysis with hydrochloric acid and zinc chloride yields glucose quantitatively. Treatment of the triacetate with hydrochloric acid in methyl alcohol solution gives a yield of 94.3% methyl glucoside. The triacetate, after purification, has a rotation of $[\alpha]_D$ $-21.3°$, and is identical in all respects with cotton cellulose triacetate. Methylation of the acetate and hydrolysis of the trimethyl ether yields 2,3,6-trimethylmethylglucoside, the latter on hydrolysis giving the characteristic crystalline 2,3,6-trimethylglucose. A chloroform solution of the triacetate yields a cellulose acetate fiber on dry-spinning identical with cotton cellulose acetate fibers. On hydrolysis of the acetate fibers with alcoholic sodium hydroxide, the regenerated cellulose gives an x-ray diagram which, as found by Dr. George L. Clark, has the typical diffraction pattern of natural cellulose.

Preliminary investigations on similar membranes formed by the action of *Acetobacter xylinum* on fructose, sucrose, mannitol, glycerol and glyceric aldehyde would seem to point to the identity of all of these products with natural cellulose.

INDUSTRIAL AND CELLULOSE CHEMISTRY LABORATORIES HAROLD HIBBERT
PULP AND PAPER RESEARCH INSTITUTE J. BARSHA
MCGILL UNIVERSITY
MONTREAL, CANADA
RECEIVED SEPTEMBER 11, 1931
PUBLISHED OCTOBER 5, 1931