CHEMICAL NATURE AND MODE OF FORMATION OF PEPSIN, TRYPsin AND BACTERIOPHAGE

By Dr. JOHN H. NORTHROP
LABORATORIES OF THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH, PRINCETON, N. J.

The field of enzymes has always been a sort of men's land between the fields of chemistry and biology. In the early days of science reactions occurring in, or caused by, living organisms were grouped together as fermentations and were supposed to be qualitatively different from the reactions of inorganic material. In the course of the nineteenth century the work of Payen and Persoz, Schwann, Kühne and Buchner and many others showed that most of these reactions were caused by the presence of unknown substances formed by the living cells, but which were not living. These substances were called "enzymes" by Kühne. Berzelius early pointed out that these reactions were very similar to the catalytic reactions of inorganic chemistry, and the work of Tamman, Arrhenius, Henri, Michaelis, Nelson, Euler, Willstätter, Warburg and other chemists has shown that this view was correct. It is only recently, however, that enzymes have been accepted as a part of chemistry and it is very gratifying that research on enzymes should be selected for a chemical award.

- The chemical nature of the enzymes themselves remained quite unknown until a few years ago. In the last eleven years a number of enzymes have been isolated and crystallized and have been found to be proteins. The hydrolytic enzymes, urease (Sumner), pepticin (Northrop), trypsin, chymo-trypsin (Kunitz and Northrop), carboxypeptidase (Anson), amylase

1 Lecture delivered on the occasion of the presentation of the Charles Frederick Chandler Medal of Columbia University on October 27, 1937. The lecture was illustrated by lantern slides.