

## Enzyme Research

### Ergebnisse der Enzymforschung

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THIS year's volume of the "Ergebnisse" deals in the main with the remote sections of the subject and to that extent is of special rather than general interest. Inasmuch as progress on the experimental side depends on the development of new technique, some of the contributions are of importance. For example, two Indian investigators in Bangalore deal with the application of dilatometry to enzyme reactions, which involves the measurement of volume changes under carefully standardized conditions. Though the mechanism through which volume change is caused is not clearly understood, it is claimed that the validity of its application has been established in specific cases by a comparative and critical study. The practical difficulty is to be sure that the reaction, or rather mean result of possibly several reactions measured, is the one which the experimenter describes.

Perhaps the most interesting chapter is that by Hugo Theorell of Stockholm on the yellow ferment and its component, known in crystalline form as lactoflavin, which appears to be vitamin B<sub>2</sub> and about which so much has been discovered working with extremely small quantities of material. In the ferment, the presence of which must be regarded as essential to life, the lactoflavin is joined to a pentose sugar, phosphoric acid and protein, a combination which seems usual in the cell. It acts as a hydrogen carrier, the physiological problem being whence comes this hydrogen and whither it goes. Lactoflavin has been synthesized. The summary is a useful one of this most important subject.

Miss Stephenson, of Cambridge, writes of hydrogenylase—an alarming word to describe bacterial enzymes which produce molecular hydrogen from formic acid. The work done on this reaction indicates that since all substances so far known to yield hydrogen by bacterial action also yield formic acid, the hydrogen is liberated from this substance.

A somewhat lengthy paper contributed from Lwów, by J. K. Parnas, deals with the vexed question of the changes which take place during the breakdown of glycogen in muscle. The changes are complex, and they involve phosphates; there

is much controversial matter in the article, which would have been improved by a summary. The editors of the "Ergebnisse" should encourage authors, even in the most specialized fields, to make clear wherever possible the probable position in relatively simple language and not leave it to the unfortunate general reader to become lost in the confusion of contradiction and detail.

Everyone must experiment with heavy water in these days, and there is a section on ferment reactions in its presence from K. F. Bonhöffer of Leipzig. It is largely mathematical and does not make any particular point.

The chapter by Emil Abderhalden on the protective ferments demands careful study. Apparently when foreign substances of a hydrolysable character are introduced into the blood stream, it is not long before appropriate new enzymes appear capable of breaking them down, and these enzymes afterwards appear in the urine. These protective proteinases are characterized by being sharply specific towards the substrate which has called them into being. Their origin has not been discovered; they can be detected in blood serum and in urine within less than 24 hours of the introduction of the foreign substance. The subject is a new one and obviously of outstanding importance. It is interesting to note the two conflicting trends in enzyme theory—some emphasize the absolute character of the specificity, others consider a particular enzyme, for example emulsin, to have a wide range of activity though it acts on some substrates with extreme slowness.

Lastly may be mentioned an American contribution, by J. B. Summer of Ithaca, on antiurease, a member of the class of anti-enzymes of which sixteen have already been mentioned in the literature. Crystalline urease being available, it was possible to study the production of antiurease by injecting it into an animal. The author speaks of having made the purest antibody preparation yet obtained, though he has not yet succeeded in crystallizing it. This work is of importance.

These brief extracts must suffice to show some of the directions in which hopeful progress is being made. The work is truly international, the laboratories of the world are co-operating in it and it is worth while to stress this, the real and the predominant aspect of scientific chemical activity, as the true state of affairs, and to regard the excessive reference to warlike activities as largely an overstatement.

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