except in the anomalous animals that survive indefinitely, shows remarkable constancy even in dogs which live several weeks. Thus, after double vagotomy, a regulation of the heart rate is again developed which tends to bring it back towards the normal, while in the case of the respiration, such a tendency, if it exists, is much feebler. In the exceptional animals the ratio shows a marked tendency, even in the first few days, to return towards normal, both by a diminution in the pulse rate and by an increase in the rate of respiration.

3. After section of the whole of one vagus and about half of the other, the remaining vagus fibers are sufficient to keep the rate of the heart and respiration almost normal. With how small a proportion of vagus fibers intact, dogs (apart from the anomalous cases mentioned) will survive, remains to be determined, although it has been found that artificial stimulation of a comparatively small number of fibers causes the usual effects on the heart and respiration.

The Influence of the Blood Pressure and of Atropin and Nicotin on Experimental Glycosuria: J. J. R. MacLeod and D. H. Dolley. (Preliminary communication.)

The glycosuria which follows puncture of the floor of the fourth ventricle in rabbits can be inhibited by the administration of nicotine. This may act either by paralyzing the synapses of the centrifugal fibers from the so-called glycosuric center as they pass through the upper thoracic sympathetic ganglia, or be due to a fall in blood pressure.

By applying nicotin directly to these ganglia the glycosuria produced by stimulation of the central end of the vagus is also inhibited, but the marked fall in blood pressure which follows the operation necessary for exposing the ganglia, and not the effect of the drug on the synapses, may be the cause of the inhibition.

In dogs a fall of blood pressure to 40 mm.—produced by hemorrhage—causes the glycosuria produced by stimulation of the central ends of the vagi to disappear.

The injection of nicotin into dogs or rabbits rendered glycosuric by vagal or depressor stimulation does not, as a rule, have any influence in the amount of sugar in the urine.

Atropin has no constant effect either on puncture glycosuria or on that due to stimulation of the vagus or cardiac depressor. Sometimes it causes the amount of sugar in the urine to diminish markedly, at other times it has no effect. No explanation can be offered for this result.

Chas. W. Greene,
Secretary.

SCIENTIFIC BOOKS.

The Phase Rule and Its Applications. By Alex. Findlay. With an Introduction to the Study of Physical Chemistry by William Ramsay. 13 x 18 cm.; pp. lxiv + 313. New York, Longmans, Green and Co. 1904. Price, $1.60.

While physical chemistry in a certain sense is as old as physics or chemistry, the appearance of Ostwald's 'Lehrbuch der allgemeinen Chemie' some twenty years ago really marks the beginning of a new era. Since that time physical chemistry has developed along two quite distinct lines. Van't Hoff brought forward the osmotic pressure theory of solution and Arrhenius the theory of electrolytic dissociation, the two resulting in what may be called the quantitative theory of dilute solutions. Most chemists are fairly familiar with the development of this theory. Not so many people have interested themselves in the second line of work. Roozeboom felt the need of a basis of classification for the numerous double salts and compounds which are met with in inorganic chemistry. He found this in the phase rule of J. Willard Gibbs and he has developed it until it is now seen to be the one

possible general basis of classification for all chemical phenomena. Its results are purely qualitative, but they are absolute.

There has been a feeling that there was something antagonistic between the qualitative classification of equilibria and the quantitative study of equilibria. When put in this way, the feeling is seen to be absurd, since the two things supplement each other. It is only by combining the two that we can hope to attain to a quantitative theory of all chemical phenomena.

Mr. Findlay gives a very clear and elementary statement of the phase rule and its applications. The book can be recommended most heartily. There are a few mistakes here and there, but they are not of serious importance. We have here a most satisfactory introduction to the phase rule. It should not be forgotten that the phase rule is valuable in two ways, as a basis of classification and as an instrument of research. It is only the first aspect which has been considered in this volume. This is quite right and proper; but it is as an instrument of research that the phase rule is to come more and more prominently to the front in the next decade. The time has not yet come when a book can be written on this; but such a book will be necessary before very long, and it is to be hoped that Mr. Findlay may see his way clear to writing it.

WILDER D. BANCROFT.

CZAPEK'S BIOCHEMIE DER PFLANZEN, VOL. I.

ONE of the most unsatisfactory chapters on the subject of plant physiology is that relating to the chemical nature of plant substances and the reactions involved in their production and utilization. This situation has been due, not only to the intrinsic difficulties of the problems involved, but also to the unsatisfactory condition of the literature on the subject. While the handbook of Pfeffer has given the latitude and longitude of these problems to the student undertaking a serious study of the chemical aspect of plant physiology, the more detailed account of this phase of the science prepared by Czapek will be a most highly appreciated resource.

The first volume of the work under discussion reveals the scope of the undertaking. The preface indicates that the author has not proposed to write a text-book introducing the beginner to the subject, but rather to prepare a reference work which shall aid the more advanced investigator to use conveniently the work of his predecessors. This object has been most successfully accomplished, and no student of plant physiology can afford to miss this book from his list of immediately available helps.

Czapek's services have not been enumerated, however, when the results of his wide reading and patient summarizing have been recognized, since the work in question is vastly more than a mere compilation. In these days when the democratic spirit of science opens the door of public expression to men of all ranks of scholarship, the task of discriminating accurately the raw from the ripe and the hasty from the well wrought is not always readily accomplished, and a proper sorting of the material at hand by one so well qualified is a genuine service to science.

Then, again, in this eager time when so many men are straining to get the first glimpse of the real solution of fundamental problems, some are bound to guess shrewdly while others are endeavoring to be sure before speaking. To wisely divide this shrewd guess work from the solid fabric is the work of no mere compiler. In this direction, Czapek has rendered good service.

The general chapters introducing the book are all worthy, but of the various subjects treated an especial interest at present attaches to the discussion of the fundamental facts of enzyme action, of the bearing of the theory of ionization on physiological processes and the significance of colloids and the colloidal condition. These subjects are here treated in an illuminating way.

The special part discusses in detail fats, lecithins, physosterin and related compounds, carbohydrates and the bodies forming the cell membranes. On the subjects covered by this volume, the student is given a practically complete citation of the literature appearing prior to June, 1904.