tains an energy-rich phosphate bond. To the first group belong all compounds in which phosphate is combined with an alcoholic hydroxyl in an ester linkage, *e.g.*, hexose-, pentose-, triose-, glycerol- and glyceric acid phosphates. The change in standard free energy resulting from the splitting of the ester linkage of this group of compounds is estimated at $-2{,}000$ to $-4{,}000$ calories. The same numerical values with reversed sign gives a measure of the group potential. The energy-rich phosphate bonds are of the type, P-O-P, N-P, carboxyl-P, enol-P, represented by such compounds as adenosinetriphosphate, creatine and arginine phosphate, phosphoglyceryl- and acetyl phosphate and phosphoenol-pyruvate. The average energy available in these types of linkages is assumed to be 9,000 to 11,000 calories. The following reaction phases are distinguished in the constantly occurring metabolic turnover of phosphate. (1) Introduction of inorganic phosphate into ester linkage. (2) Generation of energy-rich phosphate bonds. (3) Distribution of phosphate by the adenylic acid system. (4) Regeneration of inorganic phosphate. A fine coordination between a great number of enzymatic reactions is necessary in order to avoid obstruction of the phosphate cycle by the accumulation of intermediates. The fall of the phosphate group potential from a higher to a lower level during the metabolic phosphate cycle provides a source of energy which may be utilized for a variety of purposes, *e.g.*, resynthesis of glycogen, mechanical work during muscular contraction, bone formation and various organic chemical syntheses in the cell. Lipmann suggests that a large part of available metabolic energy passes through energy-rich phosphate bonds; this provides a uniform source of energy which can be used for all-around purposes. Transfer of other active groups (amino, amidine, methyl, acetyl) occur quite generally in cellular metabolism. As in the case of phosphate transfer some of these reactions are reversible, while others are not. In the latter case there occurs a decrease in the group potential.

Sumner's article deals with the chemical nature of catalase. Theories concerning the mechanism of catalase action are discussed, especially the theory of Keilin and Hartree which is based on the claim that catalase has a diminished action on hydrogen peroxide in the absence of molecular oxygen. This observation has not been confirmed by Sumner. He proposes a mechanism in which catalase containing ferric iron forms a peroxide which is decomposed by another molecule of hydrogen peroxide.

There are two articles on photosynthesis, one by Franck and Gaffron and another by Van Niel; the latter deals more specifically with bacterial photosynthesis. Both articles contain a good deal of unpublished material. The quantum efficiency, *i.e.*, the number of light quanta needed for the photochemical reduction of one molecule of carbon dioxide, is discussed at some length. The value of Warburg and Negelein of four quanta per molecule of carbon dioxide has now been superseded by one which is three times as large. The present trend is to interpret photosynthesis in plants and certain bacteria as an oxido-reduction process which may be expressed by the following equations:

Green plants	$4(H_2O + \text{light} \rightarrow H + OH)$
	$4H + CO_2 \rightarrow (CH_2O) + H_2O$
	$2(2OH \rightarrow \text{peroxide} \rightarrow H_2O + O_2)$
Purple bacteria	$4(H_2O + \text{light} \rightarrow H + OH)$
	$4H + CO_2 \rightarrow (CH_2O) + H_2O$
	$2(2OH + H_2A \rightarrow H_2O + A)$

Photosynthesis in purple bacteria occurs without liberation of molecular oxygen. The peroxide mechanism in green plants is here replaced by one in which appropriate hydrogen donors (*e.g.*, hydrogen sulfide) regenerate the system. Van Niel suggests that the photochemical decomposition of water with the aid of chlorophyl and special enzymes is the light reaction, while the actual reduction of carbon dioxide is a dark reaction. This does not imply, however, that carbon dioxide itself is the immediate hydrogen acceptor or that it is necessarily converted to carbohydrates.

In other articles Holzapfel deals with the physical chemistry of virus proteins, Green with enzymes and trace substances, Kurssanov with enzymatic processes in living plants and Vonk with digestion in lower vertebrates. The article by Kurssanov summarizes literature not easily accessible in this country, but contains too few technical details to judge the merit of many of the experiments which are reported.

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SOCIETIES AND MEETINGS

THE EASTERN SECTION OF THE SEISMOLOGICAL SOCIETY OF AMERICA

THE Eastern Section of the Seismological Society of America held its sixteenth annual meeting jointly with the Section of Seismology, American Geophysical Union, on May 2, 1941, at Georgetown University, Washington, D. C. The members were welcomed in the name of the president of the university by the Reverend F. W. Sohon, S.J., director of the Georgetown seismic station. Ralph R. Bodle, of the U. S.

Coast and Geodetic Survey, vice-chairman of the section, presided at the meeting because of the absence of the chairman, the Reverend A. J. Westland, S.J., who was still suffering from the effects of an automobile accident.

Fifteen papers and reports were presented. E. L. Perry extended his previous report on "Methods and Operations" to include important information on recording paper; J. Lynch, S.J., aroused much interest by his paper on "Amateur Seismology"; and the New England group, headed by D. Linehan, S.J., gave their results of an intensive study of the New Hampshire earthquakes of December, 1940. B. Gutenberg kindly repeated the seismological part of his paper on "Tectonic Processes" given on May 1 before the Section of Tectonophysics of the American Geophysical Union.

The following officers were elected unanimously for next year: *Chairman,* R. R. Bodle, of the U. S. Coast and Geodetic Survey; *Vice-Chairman,* E. L. Perry, Williams College; *Secretary,* W. A. Lynch, Fordham University; *Treasurer,* H. Landsberg, Pennsylvania State College; *Fifth Member of the Executive Committee,* A. J. Westland, S.J., Spring Hill College.

Georgetown University acted as host to the section at an excellent luncheon that brought the proceedings to a close.

WILLIAM A. LYNCH,
Secretary

FORDHAM UNIVERSITY

THE SOUTHEASTERN SECTION OF THE BOTANICAL SOCIETY OF AMERICA

THE second annual meeting of the Southeastern Section of the Botanical Society of America was held in Charleston, S. C., from June 13 to 15, with 41 botanists and their guests participating. Registration was at the College of Charleston. Other institutions cooperating included the Charleston Library Society, which arranged a display of rare botanical works, and the Charleston Museum, custodian of the Stephen Elliott Herbarium.

The program featured tours about the vicinity of Charleston. The botanists were shown work in progress at the U. S. Regional Vegetable Breeding Laboratory by Director B. L. Wade. They were received at Middleton Gardens and also at Middleburg Plantation, the seventeenth century home of E. S. Dingle, bird and flower painter. Other trips included the site of Michaux's garden, the Francis Marion National Forest and Bull's Island of the Cape Romain National Wildlife Refuge. Collecting was done in a variety of southern coastal plain environments, including a cypress swamp, a savannah and a barrier island.

The Charleston Museum was host for an evening's entertainment, where by motion pictures and kodaslides the botanists were shown scenes from Cypress Gardens, historical Charleston and some of the local flora and bird life.

The business meeting was held after the dinner on Saturday evening. Dr. H. L. Blomquist, retiring secretary, presided, in place of Dr. W. C. Coker, retiring chairman, who had been unfortunately called home. Dr. J. H. Miller, the new chairman, talked on "The Need for Expanding the Botanical Sciences in the Southeastern States." Director E. Milby Burton, of the Charleston Museum, reported on a project to create a park of the Michaux garden site. A resolution was unanimously voted to the effect that the Southeastern Section of the Botanical Society of America endorsed the project and recommended that the administration of the restored Gardens be vested in the Charleston Museum.

In a discussion of the aims of the section it was emphasized that its object was to increase botanical activity and to strengthen the influence of the Botanical Society of America in the South. In furtherance of this object, it was decided to distribute a list of specialists who could assist the members in their taxonomic problems, and to arrange for a breakfast for the section at the Dallas meetings of the Botanical Society.

KENNETH W. HUNT,
Secretary

THE ELEVENTH ANNUAL FIELD CONFERENCE OF PENNSYLVANIA GEOLOGISTS

THE eleventh annual Field Conference of Pennsylvania Geologists was held at Johnstown, Pa., on May 30, 31 and June 1. The Pennsylvania Topographic and Geologic Survey acted as host. The committee consisted of State Geologist Dr. George H. Ashley, *chairman,* Assistant State Geologist Dr. R. W. Stone and R. M. Foose and M. N. Shaffner. About fifty geologists attended. Most of these were from Pennsylvania, but Maryland, New Jersey, New York, Virginia and West Virginia were represented.

Registration was on Friday morning, May 30, at the Fort Stanwix Hotel. During the afternoon a trip led by Dr. Ashley, R. M. Foose and M. N. Shaffner visited exposures of the Allegheny formation about Johnstown. The annual dinner was held that evening at the Fort Stanwix Hotel. Dr. Stone acted as toastmaster. Mayor John A. Conway welcomed the members of the conference. The principal speaker was Andrew B. Crichton, local mining engineer, who spoke about the economic aspects of coal in the Johnstown basin, and presented interesting statistics he has compiled on coal reserves in the Appalachian field. Other speakers were: Dr. B. L. Miller, of Lehigh University; Dr. Arthur Bevan, state geologist of Virginia; Drs. F.