really hexagonal. The outline of the crystal plate then comes to be bounded by curved (not straight) lines which show the hexagonal angles at the place where this average adjustment is most perfect. This curving of the bounding outlines renders the measurements variable and these measurements I regard as untrustworthy. The true hexagonal angle is 60° or 120° and the pseudo-hexagonal (but really monoclinic) angle may be 123° or 124° or its supplement and the influence of this produces its curving. Examples of such curving outlines to these crystals produced by this sort of twinning may be seen in Reichert and Brown "Crystallography of Hemoglobin, etc.," on Plate 3, Figs. 14 and 18, and Plate 4, Fig. 19, and the "regular growth" of the methemoglobin (hexagonal) over the oxyhemoglobin crystals (monoclinic but pseudo-hexagonal) which sufficiently approaches the true hexagonal angles of the methemoglobin to enter into regular growth with this substance is illustrated on Plate 4 in Figs. 20–23 in the case of shad blood. It is this pseudo-symmetry which renders the measurements of such twinned crystals uncertain and inconstant. Fortunately this difficulty does not apply in the case of the orthorhombic crystals of the bloods under consideration, nor indeed in the case of the majority of orthorhombic crystals, although this tendency to mimetic twinning must always be borne in mind. I do not think it need be considered in the case of the orthorhombic crystals of either the donkey, horse or mule, which are the animals under consideration. But the measurements of the *monoclinic* crystals from the blood of these three animals are rendered uncertain and are made variable by this tendency to mimetic twinning. Therefore it is to the orthorhombic crystals that I must turn to formulate any conclusions as to the likenesses or the differences in these bloods. Fortunately in the unoxalated blood that you sent me the production of crystals is easy, and, while their measurement is not easy, I think that you may rely upon the results obtained; at least they are as reliable as I can make them with my present methods. The results from these orthorhombic crystals as compared with those of horse and mule are given below.

	Axial Ratio $a:b:c$	Prism Angle (Normals)	Macrodome Angle (Normals)
Horse.....	0.7467 : 1 : 0.4097	73° 30′	57° 30′
Donkey.....	0.7522 : 1 : 0.4144	73° 54′	57° 42′
Mule[3].....	0.7813 : 1 : 0.4198	76° 00′	56° 30′

[3] Donkey ♂ and horse ♀.

These measurements appear to indicate, as I said at first in this letter, that the crystals of "α-oxyhemoglobin" of the donkey approach more nearly those of the horse than they do those of the mule.

Very sincerely yours,

(Signed) AMOS P. BROWN

It is impossible to utilize these results for or against the idea that species-specificity is a Mendelian character. In view of the bearing on the problem of the inheritance of species-specificity the writer thought that even these negative results might be of some interest.

A further difficulty which besets the solution of this problem is that the terms species and genus are selected on a morphological basis and not according to the protein reactions involved in the phenomena of species-specificity.

JACQUES LOEB

THE ROCKEFELLER INSTITUTE
FOR MEDICAL RESEARCH,
NEW YORK

THE AMERICAN PHYSICAL SOCIETY

THE eighty-sixth meeting of the American Physical Society was held at Columbia University, December 26–29, 1916. Sessions on Tuesday afternoon, Thursday forenoon and afternoon, and Friday forenoon and afternoon were joint sessions with Section B, American Association for the Advancement of Science, and were held at the School of Journalism. The two sessions on Wednesday were joint sessions with Sections B and C and were held in Havemeyer Hall. The following program of papers was presented:

A Proposed New Form of Seismograph. Herbert Bell.

The Velocity of Sound in Gases in Metal Tubes, as a Function of Density. Karl K. Darrow.

Measurements in Frictional Electricity. L. E. Woodman and N. R. French.

The Preparation of Metallic Mirrors, Transparent Metallic Prisms and Films by Distillation. Otto Stuhlman, Jr.

Our Part in the Advancement of World Physical Science. L. A. Bauer.

Some Experiments Concerning Magnet-Photography. L. A. Bauer and W. F. G. Swann.

On Growth of Crystal Structure in Selenium. F. C. Brown.

Experimental Evidence for the Parsons Magneton. L. O. Grondahl.

The Effect of Pressure on the Resistance of Metals and a Possible Theoretical Explanation. P. W. Bridgman.

The Infra-red Absorption Bands of Gases and the Application of the Quantum Theory to Molecular Rotations. Edwin C. Kemble.

A Criticism of the Rutherford-Bohr Atomic Hypothesis, based upon a Theorem of Phase Equilibrium of two Electrons. Albert C. Crehore.

A Physical Conception of the Reason for the Existence of Planck's Constant "h" based upon the Classical Electrodynamics. Albert C. Crehore.

The Magnetization of Iron, Nickel and Cobalt by Rotation and the Nature of the Magnetic Molecule. S. J. Barnett.

The Internal Structure of Atoms. A. W. Hull.

A New Count Method of Determining the Elementary Electrical Charge. Harvey Fletcher.

A Lecture Demonstration of the Capture of Ions by Falling Drops. E. P. Lewis and W. A. Shewhart.

Some Undescribed Disintegration Products of Radioactive Elements. Fanny R. M. Hitchcock.

Recent Progress in Spectroscopy. (Vice-presidential address before Section B). E. P. Lewis.

The Photo-Electric Effect of Radiations in the Extreme Ultra-violet. James Barnes.

Aluminum and Mercury Atoms under an Electric Field. Reinhard A. Wetzel.

Photography of Spectra in Red and Infra-red Regions. William F. Meggers.

A Relationship between Fluorescence and Planck's Radiation Law. E. H. Kennard.

The Infra-red Arc Spectra of the Metals of the Fe Group. H. M. Randall and E. F. Barker.

Some Spectra in the Photographic Infra-red. Charles F. Meyer.

The Effect of Longitudinal Alternating Magnetic Fields Upon the Hysteresis Curves Produced by Slowly Varying Currents in a Series of Iron-Carbon Alloys. C. W. Waggoner and H. M. Freeman.

Experiments with the Electric Furnace on the Anomalous Dispersion of Metallic Vapors. (By title.) Arthur S. King.

The Effect of Oxygen on the Production of Band and Line Spectra in the Electric Furnace. (By title.) Arthur S. King.

A Polarization Flicker Photometer. Herbert E. Ives.

Test of Absorption Screen for Optical Pyrometry. E. P. Hyde, F. E. Cady and W. E. Forsythe.

A New Direct Reading Precision Refractometer with Uniformly Divided Scale. G. W. Moffitt.

The Minimum Potential Required to Excite the Balmer Series of Hydrogen. James Barnes.

Impact of Electrons on Mercury Atoms. C. D. Child.

The Stark Effect. Reinhard A. Wetzel.

A Proposed Method for Measuring Disturbances in the Earth's Magnetic Field. (By title.) Herbert Bell.

The Kathodo-Luminescence Produced by Certain Tribo-Luminescent Salts of Zinc. (By title.) C. W. Waggoner.

Variations in Glow Discharge Produced by a Longitudinal Magnetic Field. R. F. Earhart and C. B. Jolliffe.

A Time-Current Equation for Making Iron Passive. C. McCheyne Gordon.

A Calorimetric Resistance Thermometer. S. Leroy Brown.

A New Design of Mercury-Break Buzzer for Generating Electrical Oscillations, and a Study of the Use of Other Buzzers in Radio Measurements. Chas. Moon.

The Reflectivity of Tungsten. W. Weniger and A. H. Pfund.

A Determination of C_2 of Planck's Radiation Law. (By title.) C. E. Mendenhall.

The Range of Recoil Atoms from Actinium Emanation. L. W. McKeehan.

The Intensity of X-ray Spectra. (By title.) Arthur H. Compton.

The Distribution of the Electrons in Atoms. Arthur H. Compton.

The Effect of Transverse Joints on the Magnetic Induction in Iron and Nickel. S. R. Williams.

A Resonance Method for Measuring the Phase Difference of Condensers of Fixed Capacity and a Comparison of Resonance and Bridge Methods. J. S. Ward.

The Thermophone as a Precision Source of Sound. H. D. Arnold and I. B. Crandall.

A Uniformly Sensitive Instrument for the Absolute Measurement of Sound Intensity. E. C. Wente.

Note on the Ionization Manometer. O. E. Buckley.

An Accurate Method for the Determination of Surface Tension. W. D. Harkins and F. E. Brown.

Surface Tension, Total Surface Energy, Solubil-

ity, Emulsification and Polar Setting in Surfaces. W. D. Harkins.

The Variation of the Mobility of the Negative Ion with Temperature in Air of Constant Density. Henry A. Erikson.

Intensity of Emission of X-rays from Metals. C. S. Brainin.

Extension of Recently Published Work on Ionization Potentials. J. C. McLennan.

The Significance of Certain New Phenomena Recently Observed in Preliminary Experiments on the Temperature Coefficient of Contact Potential. (By title.) A. E. Hennings.

The Energy of Emission of Photo-electrons from Film-coated and Non-homogeneous Surface. A Theoretical Study. (By title.) A. E. Hennings.

The Possibility of a Science of Experimental Meteorology. B. P. Weinburg.

A Proposed Method for the Photometry of Lights of Different Colors. (By title.) Irwin G. Priest.

At the joint sessions on Wednesday with Sections B and C of the American Association for the Advancement of Science, the following papers were presented by invitation.

Radiation and Atomic Structure. (Presidential address before the American Physical Society.) R. A. Millikan.

The Atom and Chemical Valence. G. N. Lewis.

Molecular Resonance and Atomic Structure. Robert W. Wood.

The Evolution of the Elements as Related to the Structure of the Nuclei of Atoms. Wm. D. Harkins.

The Relation of Magnetism to the Structure of the Atom. Wm. J. Humphreys.

The Relations of Magnetism to Molecular Structure. Albert P. Wills.

The Structure of Solids and Liquids, and the Nature of Interatomic Forces. Irving Langmuir.

Electromerism: A Case of Chemical Isomerism Resulting from a Difference in Distribution of Valence Atoms. Lauder W. Jones.

The following responded to invitations to discuss the papers: Wm. Duane, A. C. Crehore and K. G. Falk. Mr. Falk read the discussion of J. M. Nelson. The discussion was then thrown open and participated in by W. F. G. Swann, A. G. Webster, M. I. Pupin and others.

Many physicists attended the addresses Tuesday evening of the retiring president of the American Association for the Advancement of Science, Director W. W. Campbell, of the Lick Observatory, on "The Nebulæ," and the special program of Section D, Friday evening, on "The Inter-relationship of Engineering and Pure Science." This session was held at the Engineering Societies Building and was followed by a reception to visiting members of the A. A. A. S.

At a short business session the result of the mail ballot for the election of officers was announced. R. A. Millikan, H. A. Bumstead, A. D. Cole and J. S. Ames was reelected president, vice-president, secretary and treasurer respectively. H. A. Wilson and G. O. Squier are the new members of the council. F. Bedell is reelected managing editor, and O. M. Stewart, N. E. Dorsey and Wm. Duane are elected on the editorial board of the *Physical Review*. The reports of the treasurer and the managing editor were presented and on motion, accepted. (These will be printed and mailed to all members.) It was announced that the next meeting of the society would probably be in connection with the Midwinter Convention of the American Institute of Electrical Engineers at New York, February 14–16.

The subscription dinner on Thursday evening was attended by about eighty, and was much enjoyed. The exhibit of new apparatus and results in the Commons Building was open from 4 to 6 P.M., daily, and on Friday afternoon the instruction and research laboratories for physics in Fayerweather Hall were on exhibition with members of the teaching staff in attendance. For these courtesies and many others the society is indebted to Director Geo. B. Pegram, who also had charge of the physics portion of the apparatus exhibit.

The attendance at this meeting was record-making, about 325 at the joint sessions on Wednesday and about 200 at most of the ordinary sessions. The number of new members elected at the meeting was forty, which also probably establishes a new record.

A. D. COLE,
Secretary

SOCIETIES AND ACADEMIES

THE BIOLOGICAL SOCIETY OF WASHINGTON

THE 562d regular and the 37th annual meeting of the society was held in the Assembly Hall of the Cosmos Club, Saturday, December 16, 1916, called to order by President Hay at 8 P.M. with 23 persons present.

Annual reports of officers and committees were submitted.

Election of officers for the year 1917 resulted as follows:

President, W. P. Hay.