'Some of the Important Results of Recent Chemical Investigations of Plant and Animal Cells,' E. A. de Schweinitz.

'Composition of Ohio Wines,' A. W. Smith and Norman Parks. The ratio of glycerol to alcohol in native wines is usually taken as 7–14 to the 100. From pure wines made by the authors it varies from 3.9 to 11.8 to the 100 with an average of 5.

'The Determination of Turbidity of Water,' W. P. Mason.

'Efficiency of the Elmira Filtering Plant,' W. P. Mason.

Miss Isabel F. Hyams and Mrs. Ellen H. Richards, in presenting their paper, 'On the Composition of *Oscillatoria prolifica* (Greville) *O. rubescens* (de Candolle) and its Relation to the Quality of Water Supplies,' exhibited samples of the blue-green algæ found in Jamaica Pond, Boston, during the months of May, June and July. The algæ seem to be identical with that found in Lake Geneva in 1834–6, and later in Lake Mérat. During the growth of this moss the water assumes a brownish-red appearance, and on a hot, still day it separates out as a cream, which is easily driven by the winds upon the rocks, where it decays, giving off a disagreeable, fetid odor. While numerous substances were extracted from the moss, no ill effect is known which may be attributed to this source.

'The Le Seuer Electrolytic Process for the Production of Caustic Soda and Bleaching Powder,' read by Dr. C. L. Parsons, depends upon iron bars supporting a wire gauze as a diaphragm and the use of platinum-iridium anodes bound up in glass. In another paper, 'A Review of the Electrolytic Processes for the Production of Caustic Soda and Bleaching Powder,' by the same author, it was claimed that the process described would replace the Castner-Kellner and other processes on account of economy and efficiency.

'The Alum Question in Water Purification,' E. G. Smith.

Dr. C. F. Mabery and Mr. K. Landgrebe stated that 'The Effect of an Electrolytic Bath on the Tanning of Leather' was the reduction of the time consumed, and they observed that the percentage of nitrogen was lower in leather so tanned.

'Some Records in the Year's Progress in Applied Chemistry,' Wm. McMurtrie.

'The Progress in Utilization of City Garbage, with Special Reference to the New Plant in Boston,' Bruno Terne.

'On the Removal of Hardness from Water for Boiler Purposes,' C. F. Mabery and E. B. Baltzly. All kinds of hard water have from 90–98 per cent. of the lime present and all suspended matter are precipitated cold by treatment for twenty-four hours with half the calculated amount of sodium aluminate.

'New Process for the Commercial Production of Oxygen and its Industrial Applications," Romyn Hitchcock.

The meeting was most successful in every way.

CHAS. BASKERVILLE,
Secretary.
UNIVERSITY OF NORTH CAROLINA.

PHYSICS AT THE BOSTON MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (I.).

SECTION B of the American Association was organized with Vice-President F. P. Whitman in the Chair. His vice-presidential address, on color-vision, printed in the issue of SCIENCE for September 9th, was well received and constitutes a *résumé* of the subject of great value.

The program of the section included fifty titles of papers, of which forty were read before the section. Many of these papers were of very high order and almost every one of them was creditable and interesting.

The Measurement of Thermal Conductivity in Iron. By Professor E. H. Hall, Cambridge, Mass.

The author pointed out that the method in which thin plates are used is unsatisfactory owing to the difficulty of determining the difference of temperature of the two faces. He obviates this by copper-plating the two faces of his iron plate and by using the copper-iron thermocouples thus formed for determining the temperature difference. He finds that the conductivity of iron increases as the temperature is decreased at the rate of about one per cent. for eight degrees Centigrade.

On the Magnetic Deflection of Diffusely Reflected Cathode Rays. By Professor Ernest Merritt.

On the Electrical Properties of the Vapor from the Arc. By Professor Ernest Merritt and O. M. Stewart.

Professor Merritt finds that diffusely reflected cathode rays are deflected by a magnet to the same extent as the same rays before reflection. Professor Merritt and Mr. Stewart find that the vapors from the electric arc produce electrical discharge in a manner similar to the action of a gas which has been exposed to X-Rays. Vapors from the negative carbon discharge negative charges more readily than positive charges.

In their report on the Velocity of Light in the magnetic field Professors E. W. Morley, H. T. Eddy and D. C. Miller described their interferometer, the two optical paths of which consist of tubes of carbon bisulphide surrounded by very large magnetizing coils. These coils were wound in halves which could be connected differentially or directly at will. It was found that the velocity of light in CS_2 is not altered by one part in sixty millions by a magnetic field of such intensity as to rotate the plane of polarization 180° in 60 cm.

A Study of Galvanic Polarization. By Barry McNutt, South Bethlehem, Pa.

The author finds that the polarization of a $Cu-CuSO_4-Cu$ cell (and the same is true of cells of silver and of zinc) is not zero with infinitesimal (?) current.

A Lecture Room Experiment in Electrostatics. By Professor W. S. Franklin, South Bethlehem, Pa.

The author exhibited an experiment illustrating the instability of electrified liquid films. A brass ladle with a sharp lip is nearly filled with melted rosin; it is then electrified, by joining it with an electrical machine, and tilting until the rosin runs in a thin layer over the lip, when it is blown out in a cloud of silky threads highly electrified.

The Most Efficient Thickness of Transformer Plates. By Professor F. Bedell, R. M. Klein and T. P. Thompson, Ithaca, N. Y.

On plotting the curve showing the relation between the thickness of the plate and the total loss due to hysteresis and eddy currents it is found that the curve has a broad, flat minimum extending from about 10 to 15 thousandths of an inch in thickness of the plate.

Proposed Methods of Determining the Frequency of Alternating Currents. By Karl Kinsley, Falls Church, Va.

Mr. Kinsley advised using a clamped, free bar provided with an adjustable rider and set in vibration by an electro-magnet actuated by the current to be studied.

A New Gas. By Charles F. Brush, Cleveland, Ohio. (Printed in Science for October 14th.)

Polarization and Internal Resistance of the Voltaic Cell. By Dr. Karl E. Guthe, Ann Arbor, Mich.

Graphical Treatment of Mutually Inductive Circuits with Special Reference to the Case of Variable Frequency. By Professor H. T. Eddy, Minneapolis, Minn.

The Hysteresis of Iron and Steel at Ordinary Temperatures and at the Temperature of Solid Carbon Dioxide. By A. M. THIESSEN, Ithaca, N. Y.

IT was found that the hysteresis loss for constant magnetizing fields increases with the temperature if the field is weak, but the opposite is the case when the iron is nearly saturated.

Some Determinations of Dielectric Strength. By PROFESSOR THOMAS GRAY, Terre Haute, Ind.

STEP-UP ring transformers were used and the potential difference was determined by an electrometer. It was found that the dielectric strength for air is the same for alternating currents of ordinary frequency as it is for static charges.

A Study of Standard Meter Scales ruled on Nickel, Silver and Glass. By PROFESSOR D. C. MILLER, Cleveland, Ohio.

AFTER an exhaustive study of scales of various kinds Professor Miller concludes that nickel scales are far superior to those in common use, and indeed as good as platinum iridium, except that they have a somewhat higher coefficient of expansion. His nickel bar, made by the Geneva Society, is very accurately divided, and he has calibrated it throughout by the international method.

An Instrument for Measuring Radiance. By PROFESSOR KNUT ANGSTRÖM.

THE instrument was exhibited by Mr. E. S. Ferry, and consists essentially of two bolometer strips, one of which is heated by the radiance to be measured and the other is heated to the same temperature by an electric current, from which the absolute valve of the radiance may be calculated.

A Redetermination of the Ampere. By GEO. W. PATTERSON and KARL E. GUTHE, Ann Arbor, Mich.

THE authors used an electrodynamometer the moment of whose coil was balanced by the torsion of a wire of small elastic fatigue. The work seems to have been done with extraordinary care and gives 0.0011192 grams per sec. per ampere for the electrochemical equivalent of silver. This reconciles the difference between Rowland's value for the mechanical equivalent of heat and that obtained by electrical methods. The paper occasioned a great deal of favorable comment.

Progress in the Exploration of the Air with Kites at the Blue Hill Observatory. By A. LAWRENCE ROTCH, Director.

On the Osmotic Pressure of certain Ether Solutions and the Validity of the Boyle-Van't Hoff Law. By PROFESSOR H. M. GOODWIN and GEO. K. BURGESS, Boston, Mass.

IT was shown that the Boyle-Van't Hoff law holds as a first approximation only.

On the Dielectric Constant and Electrical Conductivity of Liquid Ammonia. By PROFESSOR H. M. GOODWIN and MAURICE DE KAY THOMPSON, Boston, Mass.

IT is found that the dielectric constant of liquid ammonia is less than it is for water, while the electrical conductivity of solutions of salts in ammonia is greater than it is for solutions of the same salts in water.

The two reports and five papers following were read in joint session with Section A.

Report on the Recent Progress in the Dynamics of Solids and Fluids. By PROFESSOR ERNEST W. BROWN, of Haverford College, Pa. [To be printed in SCIENCE.]

Report on the Recent Progress in the Mathematical Theory of Electricity and Magnetism. By PROFESSOR ARTHUR G. WEBSTER.

The Mass and Moment of Inertia of the Earth's Atmosphere. By PROFESSOR R. S. WOODWARD, Columbia University, New York.

PROFESSOR WOODWARD pointed out our ignorance of the necessary data and gave the results arrived at by making various hypotheses.

Temperature and Vapor Gradients in the Atmosphere. By Professor F. H. Bigelow, Washington, D. C.

Two New Forms of Apparatus for Measuring the Acceleration of Gravity. By Professor R. S. Woodward.

The author suggested the use of the vibrations of a weight hung from a helical spring. Professor T. C. Mendenhall suggested the use of a flat ring as a pendulum, the only linear measurement required being the external diameter of the ring.

The Structure of Cyclones and Anticyclones. By Professor F. H. Bigelow.

The Gravitation Constant and the Mean Density of the Earth. By Professor R. S. Woodward.

Professor Woodward pointed out a new form of the relation between these two quantities.

On the Relative Brightness of Pigments by Oblique Vision. By Professor F. P. Whitman, Cleveland, Ohio.

Professor Whitman used the flicker photometer and found that the brightness at the red end of the spectrum decreases as the vision becomes more oblique, while the opposite is true (but to a less extent) at the violet end. The brightness of yellow-green is nearly independent of the angle.

A New Instrument for the Measurement of the Intensity of Sound. By Professor A. G. Webster and Mr. B. F. Sharpe.

The method consists in measuring, by means of an interferometer, the amplitude of vibration of a thin glass plate. The interference fringes are photographed on a revolving drum. The constants of the instrument can be experimentally determined and the intensity of the sound can be calculated in absolute terms.

Exhibit of an Automatic Mercurial Air Pump designed by Professor E. W. Morley. By Professor D. C. Miller.

The peculiar advantages of the pump are that it need not be situated near the automatic controller, and that the mercury does not come in contact with rubber. It can be actuated with a water pressure of 20 pounds per square inch and can produce a vacuum of 1-500,000,000 of an atmosphere.

An Apparatus for demonstrating in Alternating Currents the Change of Phase due to either Inductance or Capacity. By Professor Sidney T. Moreland, Lexington, Va.

An Apparatus for determining Coefficients of Induction. By Professor Sidney T. Moreland.

This apparatus consists of two coils at right angles, producing a rotating magnetic field when alternating currents of different phase are sent through the two coils. A copper cylinder is suspended in this rotating field and indicates the phase relations of the two currents.

An Improved Method for rating Tuning Forks. By J. O. Reed, Ph.D., Ann Arbor, Mich.

The method is a modification of that used by Professor Michelson, but instead of using an electric spark Dr. Reed employs the flash of light from a mirror rotated by a secondary pendulum, which is in turn compared with the standard clock.

A New Chronograph and a Means of Rating Tuning Forks. By Professor A. G. Webster.

The chronograph is actuated by a small motor regulated by a tuning fork.

A Geometrical Method for Investigating Diffraction by a Circular Aperture. By Professor A. G. Webster.

Professor Webster obtains a kind of 'rachet' Cornu's spiral for this case of diffraction, that is a spiral having Cusps.

Study of Elastic Fatigue by the Time Variation of the Logarithmic Decrement. By Professor J. O. Thompson.

Photographic Studies of the Electric Arc. By N. H. BROWN, Ithaca, N. Y.

On the Efficiency of Condensers. By PROFESSOR E. B. ROSA and ARTHUR W. SMITH, Middletown, Conn.

THE authors give results determined by their resonance method, which was described at the Detroit meeting.

A Calorimetric Determination of the Energy Dissipated in Condensers. By PROFESSOR E. B. ROSA and ARTHUR W. SMITH.

The Effect of Fibrous Structure in Iron on its Change of Length when Magnetized. By E. RHOADS, PH.D., Baltimore, Md.

Notes on the Effect of Silicon on the Magnetic Permeability of Iron. By PROFESSOR F. C. CALDWELL, Columbus, Ohio.

IT was found that the permeability increases with the amount of silicon present in the iron.

On the Measurement of Electrical Oscillations of Short Period and their Absorption by Water. By PROFESSOR A. D. COLE, Granville, Ohio.

THIS is a continuation of the work which was reported by Professor Cole to Section B at Buffalo.

An Acoustical Micrometer. By J. O. REED, PH.D., Ann Arbor, Mich.

ITS principle consists in measuring the amplitude of vibration of a stretched membrane.

Polarization in the $Zn - H_2SO_4$ Cell. By PROFESSOR W. A. ANTHONY, New York City.

AFTER an extended research into the effect of saturating the acid with hydrogen, oxygen and carbon dioxide, Professor Anthony concludes that what is called polarization is not due to the accumulation of hydrogen, but to the fact that the oxygen originally dissolved in the acid and condensed on the plates has been used up.

The Heat of Fusion of Ice Determined in Electrical Units. By PROFESSOR E. L. NICHOLS, Ithaca, N. Y.

The Electrical Resistance of Lead Amalgams at Low Temperatures. By G. W. GRESSMAN, Ithaca, N. Y.

THE most striking fact reported in this paper is the sudden decrease in resistance upon solidification, the resistance of the solid amalgam being sometimes as low as one-fifth of the resistance of the fluid amalgam at its freezing point. If the thermo-electrical explanation—based on heterogeneity—of excessively high resistance of alloys is correct one would expect an increase of resistance upon solidification, for it is then that the alloy becomes heterogeneous.

N. ERNEST DORSEY,
Press Secretary.

THE ADVANCE OF PSYCHOLOGY.*

THE American Association for the Advancement of Science, when it first met fifty years ago, had no place for anthropology nor for psychology. Science has its origin in the practical needs of society. In a new country of great area and rich resources the energies of its people were directed to invention and exploration. The spirit of Franklin led to the development of railways, steamboats and telegraphy, to the building of cities and the search for mines.

But not only in America and in the case of the anthropological sciences have fifty years brought great changes. Science has become a leading factor in modern life by the rapidity rather than by the duration of its growth. Our own revered Dr. Hall might have talked with Herschell, who could almost have touched the hand of Newton. Newton was born the year that Galileo

*Address of the Vice-President of Section H—Anthropology—of the American Association for the Advancement of Science, August, 1898.