not always an indication of relative transpiration rate. In comparing plants of *Phaseolus vulgaris* transpiration rate parallels stomatal index but does not always parallel stomatal number.

These observations support the view that juvenile leaves may be used to advantage for comparing plants in breeding work dealing with transpiration rate. They also support the view that transpiration rate is associated with stomatal index and not with stomatal number. Stomatal index may be determined from any of the leaves of a young bean plant.

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SOCIETIES AND MEETINGS

THE NEW YORK MEETING OF THE AMERICAN PHYSICAL SOCIETY

THE two hundred and twenty-sixth regular meeting of the American Physical Society was held in New York City on Thursday, Friday and Saturday, February 23, 24 and 25, 1939. All regular sessions of the society devoted to the reading of contributed papers were held in the Pupin Physics Laboratories of Columbia University, while the Saturday morning symposium meeting devoted to television took place in Studio 3A of the National Broadcasting Company in the RCA building at 30 Rockefeller Plaza.

On Thursday morning the Inter-Society Color Council held its business session at 480 Lexington Avenue, and the afternoon was devoted to a technical session on color tolerances, sponsored jointly by the Inter-Society Color Council and the American Psychological Association. Seven papers were presented, dealing with such subjects as the physics of color tolerance, the psychophysics of color tolerance, the representation of color tolerances on the chromaticity diagram, specification of tolerances at the National Bureau of Standards, industrial color tolerances, the ratio method in the review of Munsell colors and color tolerances as affected by changes in composition and intensity of illumination and reflectance of background. At 8:00 o'clock on Thursday evening the council held a popular session on "Parade of Color," including discussions of color in medicine, paper, textiles, industry, lighting, psychology and fashion.

The sessions of the American Physical Society were opened at ten o'clock on Friday morning with a meeting of the council and the presentation of contributed papers. A wide range of subjects was covered, falling into a number of fields. These included reports of studies of field currents at high and low pressures, of field measurements and possible correction of aberrations for magnetic electron lenses, of magnetic susceptibilities in weak fields, studies on the magnetic anisotropy of iron-nickel and copper-nickel alloys, on the theory of paramagnetic relaxation and a new approach to the problem of ferromagnetism. Studies of the structure and properties of metals included papers on the optical and magneto-optical activity of nickel sulfate, α-hexahydrate, in the short infra-red spectrum, on the preparation of single crystals of iron, cobalt, nickel and their alloys, and on the magnetic anisotropy of iron-copper and copper-nickel alloys. In the field of atomic physics there were discussions on the theoretical constitution of metallic barium, on nuclear isomers in radioactive strontium and on the band structure of metallic copper. Discussions of centrifugation and related subjects included papers on a new adaptation of the Beams ultracentrifuge for liquids, on the separation of bromine isotopes by centrifugation and on the formation and properties of unsupported flowing liquid films. Papers were also presented dealing with some physical properties of liquid and solid HD, the lack of "sucking" action by the cathode blast of mercury vapor in a pool rectifier, and the striated luminous glow of the piezoelectric quartz resonator at flexual vibration frequencies. Finally, a paper was presented by Cartwright and Turner on their interesting method of reducing the reflection from glass by deposited multilayer films.

Four contributed papers were read before the Optical Society in its session on Friday morning, which was opened at 9:30 in the Physics Laboratories. They dealt with spectro-radiography with the cathode ray tube, the first spectrum of tin, the behavior of an interferometer in a gravitational field and a calculation of the luminous efficiency of ionized cesium vapor.

A program of eighteen contributed technical papers occupied the Friday afternoon session of the American Physical Society, which was opened at the Physics Laboratory at 2:00 P.M. The program was rendered of unusual interest by discussions by Niels Bohr and Enrico Fermi of the experiments in the disintegration of uranium recently undertaken with the Columbia cyclotron. A number of other fields were treated, including those of cosmic ray studies, with papers on comparisons of counter and electroscope measurements in the stratosphere, on the origin of the rays which produce the bursts of cosmic ray ionization, and on the design and construction of reliable Geiger-Muller counters, of x-rays especially in relation to therapeutics, with papers on a compact pressure-insulated electrostatic x-ray generator for cancer therapy, on some new features in the million-volt x-ray installation at the Memorial Hospital, and de-

scriptions of a portable gamma-ray detector and a measurement of gamma-radiation in roentgens, and of spectroscopy, with papers relating to the effect of pressure on the intensity of the recombination spectrum of mercury, the spectral distribution of energy in the recombination spectrum of mercury and the spectra of SnH and PbH at high pressure. Other discussions of structure included considerations of the binding energy of He^6 and nuclear forces, the theoretical binding energy of He^5, and the energy levels of H^3, He^3 and He^5. Papers were given concerning studies of radioactive Be^7, the self-energy of the electron, and competition between $p-n$ and $p-\gamma$ reaction, and papers were presented on such widely divergent subjects as a study of the Rossi transition curve for small angle showers in layers of iron and an electrophoretic demonstration of patent pores of human skin.

The five papers presented before the afternoon sessions of the Optical Society, which was also held in the Physics Laboratories, dealt with the physiological and psychological aspects of color perception and vision. They included studies of the comparative effect of cobra venom and opiates on acuity and field of vision, facts and theories of color blindness, an experimental determination of the spectral components of psychologically unique red, of hue, saturation and lightness of surface colors with chromatic illumination, and the effect of certain variables on hue, lightness and saturation of samples having identical trilinear coordinates.

On Friday evening a joint dinner of the societies was held at the Columbia University Men's Faculty Club.

On Saturday morning a joint session of the societies, in the form of a symposium and demonstration on television, was held in Studio 3A of the National Broadcasting Company in the R.C.A. building at 30 Rockefeller Plaza, opening at ten o'clock. Both the symposium and demonstration were striking and of great interest. The planned program had included papers by V. K. Zworykin, of the RCA Manufacturing Company, on electron optics as applied in television systems and by P. T. Farnsworth, of Farnsworth Television Incorporated, on the application of electron multipliers to television systems. It was found that Dr. Farnsworth was unable to be present, however, so Dr. Zworykin provided both papers, his first dealing with the historical development of the theory of television, his second devoted to a discussion of the present New York City installation recently completed by R.C.A. The demonstrations which followed were conducted by A. F. Van Dyke, of the Radio Corporation of America, and were of great interest, especially since installations both of the very large experimental projection receiver and of the type of receiver which will shortly be marketed for home use had been included in the studio and were operated simultaneously. The symposium was well attended.

The American Physical Society met in three sections on Saturday afternoon to hear a total of twenty-eight contributed papers. The papers presented before the first section dealt predominantly with scattering and other phenomena in the bombardment of matter by protons and neutrons, including studies of the resonance scattering of protons by lithium, the scattering of neutrons by hydrogen and deuterium molecules, the scattering of $D-D$ neutrons, the elastic scattering of fast neutrons, and the ionization produced in gases by fast neutron irradiation. There were also discussions on the nuclear moments of the rubidium and chlorine isotopes, the electric quadrupole moment of In^{115}, the temperature in white dwarf stars, the self-energy of the electron and general relativity theory and flat space.

The papers of the second group were somewhat miscellaneous and of very wide scope. There were discussions of thermal and stress dependence of elasticity in solids, determination of the nature of a light source from wide-angle interference measurements, the measurement of x-ray production in the range 0.8 to 2.0 million volts, the uniqueness of an x-ray crystal analysis, on a general equation of state with reference to the equations for ammonia and steam, on the probability of K ionization of nickel by cathode rays, the electronic structure of alloys, inertial mass and a discussion of the difference in scope of theoretical physics and pure mathematics.

Four papers in infra-red, ultra-violet and x-ray spectroscopy were presented before the third section on Saturday afternoon. These included studies of the infra-red spectra of the fatty acids, the infra-red absorption spectrum of phenol vapor, the absorption spectrum of heavy benzene at 2730–2205 Å and a description of an apparatus for determining the orientation of crystals by x-rays. There were also papers on a re-evaluation of the atomic constants, the accommodation coefficients of helium *vs.* nickel, an investigation of the gettering powers of various metals for the gases hydrogen, oxygen, nitrogen, CO_2 and air, on the thermal conduction of metallic contacts, and finally on a determination of the radon content of the spring waters of Fairmount Park, the last listed paper of the meetings.

The next meeting of the American Physical Society will be held in Washington, D. C., from April 27 to 29, with a subsequent meeting in June at Stanford University, California, the date of which is still to be determined.

CARYL P. HASKINS

SCHENECTADY, N. Y.