TABLE I.

p_0/mc	$\phi'(\text{cm}^2)$	$g_1=g_2$ $\phi''(\text{cm}^2)$	$\phi(\text{cm}^2)$	$\phi'(\text{cm}^2)$	$g_1=g_2$ $\phi''(\text{cm}^2)$	$\phi(\text{cm}^2)$
1	1.91×10^{-26}	1.91×10^{-26}	1.91×10^{-26}	2.25×10^{-26}	2.25×10^{-26}	2.25×10^{-26}
2	5.38	5.27	5.13	5.20	5.22	5.21
4	2.84	3.11	3.67	2.51	2.55	2.70
6	1.66	2.20	2.48	1.43	1.64	1.98
8	1.14	1.84	1.74	0.96	1.43	1.59

found, however, that our formulae (7) and (16) give angular distributions which do not agree very well with that given by the exact solution. For example, we have for $g_1=g_2$, $p_0/mc=8$,

$$\frac{d\phi'}{d\Omega_f}=0.0096(939+543\cos\theta_{fi})\times10^{-28}, \tag{17}$$

$$\frac{d\phi''}{d\Omega_f}=0.871(939+543\cos\theta_{fi})(0.0543+0.01146\cos\theta_{fi}-0.0493\sin\theta_{fi})\times10^{-28}, \tag{18}$$

which differ considerably from the exact formula

$$\frac{d\phi}{d\Omega_f}=(13.8+13.5\cos\theta_{fi})\times10^{-28}$$

in some directions. In order to get better agreement, it would be necessary to choose some more suitable function for U_{fi} or introduce more parameters.

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Proceedings of the Southeastern Section of the American Physical Society

MINUTES OF THE ATLANTA, GEORGIA, MEETING ON APRIL 6 AND 7, 1945

THE eleventh annual meeting of the Southeastern Section of the American Physical Society was held on a restricted basis in the Atlanta Biltmore Hotel and at the Georgia School of Technology, Atlanta, Georgia, on Friday and Saturday, April 6–7, 1945. Thirty-four out-of-town members and guests attended; local members and guests brought the attendance to approximately fifty persons. Local arrangements were made by a committee headed by E. E. Bortell.

The regular program consisted of ten papers, abstracts for three of which are appended hereto. Abstracts of the other papers will be found in a later issue of the *American Journal of Physics*.

Additional features of the program were: a Symposium on High Polymers (at which the following papers were presented: "The Chemical Characterization of High Polymers," by Kyle Ward, Jr.; "X-Ray Diffraction as Applied to the Study of Semi-Crystalline Materials," R. C. L. Mooney; and "The Relation of Physical Properties to the Molecular Character of High Polymers," Emil Ott); a review of the American Association of Physics Teachers meeting recently held in New York, by D. R. McMillan;

and an informal panel discussion, following the annual dinner, on the general topic of the training of physicists for work in industry.

At the business meeting the election of the following officers for the Section was announced: Chairman, F. L. Brown; Vice-Chairman, R. C. L. Mooney; Secretary, E. Scott Barr; Treasurer, C. B. Crawley; and Member of the Executive Committee, A. E. Ruark.

The time and place for the 1946 meeting are to be announced later.

E. SCOTT BARR, *Secretary*

ABSTRACTS OF CONTRIBUTED PAPERS

1. A Modification of Kavanau's Relation. R. T. LAGEMANN, *Emory University, Emory University, Georgia.*—A recent equation by Kavanau[1] relates interatomic distance and bond multiplicity for a pair of atoms, whether these atoms occur in diatomic or polyatomic molecules. Examination of the constants of that equation shows them to be related to the sum, M, of the atomic weights of the atoms making up the bonded atom pair. If the constant b is set proportional to M and the constant a inversely proportional to M, we have

$$D=\frac{K_1}{M}+K_2M\left(\frac{n_1+n_2-1}{n_1+n_2+1}\right)^N$$

where D is the interatomic distance, N the bond multiplicity, and n_1 and n_2 the principal quantum numbers of the valence electrons. K_1 and K_2 are constant for all pairs of atoms having the same value of n_1 and the same value of n_2. For pairs of atoms where $n_1=n_2=2$ the calculated values of the interatomic distance are given by this new relation with an average deviation of 0.03 angstroms from the observed values.

[1] J. L. Kavanau, J. Chem. Phys. **12**, 467 (1944).

2. Air Resistance Bridge for Measuring Fiber Properties. K. L. HERTEL, *University of Tennessee, Agricultural Experiment Station.*—The ratio of the external surface of a fiber to its volume may be used as a measure of fiber fineness. The resistance offered to air flow by fibers confined in a tube with perforated ends is a function of the tube cross-section, length of fiber wad, air viscosity, fiber orientation, fiber surface per unit volume, and porosity of the fiber wad. A predetermined mass of fibers in a cylindrical tube with perforated ends constitutes one resistance, and three capillary tubes the other resistances of an air "Wheatstone bridge." Air pressure of about two centimeters of water produced by an aspirator bulb and slack bellows provides the potential difference, while an inclined kerosene-filled manometer takes the place of the galvanometer and indicates the balance of the bridge. The fiber wad is compressed first to balance a low standard resistance and then a high standard resistance. The corresponding wad-lengths, along with constants of the instrument, furnish the necessary data to determine the fiber surface per unit volume or per unit mass and the density of the fiber material.

3. Grid Control of X-Ray Tubes. R. PEPINSKY, *Alabama Polytechnic Institute* (on leave at the Radiation Laboratory, Massachusetts Institute of Technology).—Addition of control grids in x-ray tubes provides advantages which have been utilized by Bouwers[1] and others in deep-therapy and radiographic work, and recently by Eisenstein[2] in diffraction investigations. Some properties of grid-controlled operation are considered, and two further applications to diffraction studies are discussed. In the first of these, the grid is biased below cut-off and pulsed to produce bursts of electron current and x-radiation of high peak intensity. The pulses are phased to any desired portion of some cyclic lattice distortion, such as that produced by the mechanical flexing of a material or the oscillations of a piezoelectric crystal, and atomic displacements are observed throughout the cycle. To permit observations at any frequency and phase, the high voltage is rectified and filtered; a storage condenser is provided of capacity proportionate to pulse-duration.

In the second application, grid-control serves to stabilize x-ray output. One beam from a multi-port tube (operated either on direct or pulsating current) is monochromatized and received by a Geiger counter or ionization chamber. The amplifier output is then fed back to the grid in such a manner as to maintain a monochromatized beam of fixed intensity.

[1] A. Bouwers, Arch. d'Elec. Med. **39**, 376 (1931).
[2] A. Eisenstein, Rev. Sci. Inst. **13**, 208 (1942).