F3. Failure of Schottky Theory for the Positive Column of O_2[†] D. S. Burch, G. H. Dunn, R. Geballe, and V. M. Madsen, *University of Washington.*—Measurements of the potential gradient in the uniform positive column of the O_2 glow discharge have been made using cold probes. The results are in agreement with those of Guntherschulze[1] and in the range $0.2 < pR < 2.4$ mm cm lie between 23 and 15 volts/cm mm. The Schottky theory for the uniform positive column has been extended to include electronegative gases. This extension predicts a lower limit to E/p corresponding to a value for which the attachment coefficient and the ionization coefficient are equal. In oxygen, equality occurs for $E/p = 35$,[2] considerably higher than the above measured values. Oscillographic studies of the current and light emission show rapid time variation,[3] implying that the column does not have the uniformity on which the theory is based. N_2 has been subjected to the same observations. Measured fields in this gas do agree with predictions of Schottky theory. No current and light variation is found in N_2 in the range of current and pR for which the theory is valid.

† This work has been supported in part by the U. S. Office of Ordnance Research.
[1] A. Guntherschulze, Z. Physik **42**, 763 (1927).
[2] M. A. Harrison and R. Geballe, Phys. Rev. **91**, 1 (1953).
[3] E.g., T. Donahue and G. H. Dieke, Phys. Rev. **81**, 248 (1951); A. B. Stewart, J. Opt. Soc. Am. **45**, 651 (1955); N. L. Oleson, Phys. Rev. **98**, 559 (1955).

F4. Oscillating Glow Discharge Plasma.* A. B. Stewart and G. E. Owen, *Antioch College.*—The plasma potential, electron temperature, and electron concentration have been measured as functions of both time and position in the positive column of an argon glow discharge with moving striations. Plane circular tungsten probes 0.5 mm in diameter that could be saturated in the electron collecting region were used. The variations of potential, electron temperature, and charge obtained demonstrate that the moving striations in the glow discharge are closely related in their electrical properties to the striations in the argon arc studied by Pupp.[1] In the glow discharge however, in addition to the positive striations, there are weak light flashes that travel with speeds greater than 10^5 m/sec. The plasma potential is observed to drop about 10 volts within $\frac{1}{8}$ of a period after the flash. Although space charge concentrations with maxima approximately 5 times the average concentration in the plasma accompany the positive striations, no increase in concentration was observed at the time of the light flash. The reliability of the probe measurements and the bearing of the results on theories of the moving striations will be discussed.

* Supported by the National Science Foundation.
[1] W. Pupp, Z. Physik **36**, 61 (1935).

F7. Derivation from Boltzmann's Equation of the Similarity Laws for Ionized Gases. T. E. VanZandt, *Sandia Corporation.*—The similarity laws for ionized gases are derived by requiring that the Boltzmann equations for the normalized particle distribution functions of two similar discharges be the same. The results are, in addition to the usual similarity laws, that the product of the magnetic field strength times the characteristic length be the same for both discharges.

ABSTRACTS OF PAPERS TO BE PRESENTED AT THE 1955 THANKSGIVING MEETING AT THE UNIVERSITY OF CHICAGO, CHICAGO, ILLINOIS, NOVEMBER 25 AND 26, 1955*

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Errata Pertaining to Abstracts C6, I5, Q3, V12, V13, and Y6

C6, by J. Joseph. In line 19, instead of "$4\alpha r_0^2 \ln(2\gamma)[\ln(2\gamma)+1]/\gamma$," read "$+\alpha r_0^2 \ln(2\gamma)[\ln(2\gamma)+1]/\gamma$."

I5, by V. E. Pilcher, J. A. Harvey, and K. K. Seth. The daggered reference should read: "Research Collaborator, on leave from Radiation Laboratory, University of Pittsburgh.

Q3, by W. A. Wallenmeyer. In line 12, instead of "41:12:7," read "41:12:57."

V12, by I. C. Gupta, W. Y. Chang, and A. Snyder. In line 7, instead of "66 events," read "64 events." In lines 16 to 17, instead of "31 events have been classified as θ^0 particles, 30 as Λ^0 particles," read "32 have been classified as θ^0 particles, 27 as Λ^0 particles."

V13, by A. Snyder, W. Y. Chang, and I. C. Gupta. In line 4, instead of "31 θ^0 particles," read "32 θ^0 particles"; instead of "30 Λ^0 particles," read "27 Λ^0 particles." In lines 18 to 20, instead of "for the 31 θ^0 particles . . . to be $(1.83{\,}^{+0.35}_{-0.25}) \times 10^{-10}$ sec, and for the 30 Λ^0 particles $(3.47{\,}^{+0.70}_{-0.49}) \times 10^{-10}$ sec," read "for the 32 θ^0 particles . . . to be $(1.4{\,}^{+0.3}_{-0.2}) \times 10^{-10}$ sec, and for the 27 Λ^0 particles, $(3.8{\,}^{+1.0}_{-0.6}) \times 10^{-10}$ sec."

On page 1268 "(R. H. Crane presiding)" should read "(H. R. Crane presiding)."

Y6, by E. D. Courant, R. R. Kassner, E. C. Raka, Lloyd Smith, and J. Spiro. In line 17 instead of "$2\nu_x + \nu_y$" read "$\nu_x + 2\nu_y$."