time, which results in an intensity-scale H & D curve. The sector becomes inaccurate at small apertures, but the range can be extended by means of an absorbing filter that, if the series of filtered points overlaps the unfiltered ones, need not be calibrated. For routine work, this procedure may be too tedious; probably it would be more convenient to use it as a primary standard to calibrate a line group, either of the iron-bead arc or of lines of the base element of the samples being analyzed.

Many other uses for a constant dc source should be found in the laboratory. For example, it can be used to determine the reciprocity failure of emulsions, the relative speeds of plates, the extent of scattered light in the densitometer, and the intensity of grating ghosts.

New High-Intensity Spectral Source with a Narrow Line Profile

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In absorption measurement techniques a spectral source is desired that has a resonance spectral line of high intensity. This spectral line must have a profile as narrow as possible without self-absorption. Different solutions of the problem in which a hollow cathode is used are given in the literature.1-7

In this note we describe a solution that approaches quite closely the requirements mentioned above. In Fig. 1 a schematic drawing of the electronic circuit of the source tube is given. A positive column dis-
charge occurs in a noble gas at a pressure of a few Torr, between (1), the emitting cathode, and (2) a perforated anode disk. Part of the discharge length is surrounded by a cylindrical probe (3). This probe has a negative potential with respect to the plasma potential. Owing to bombardment of the ions extracted from the plasma, atoms are sputtered from the inner surface of the probe. In that part of the column discharge a vapor density is formed of the desired element depending on the composition and structure of the probe surface. Owing to the narrow glass capillary (4), the vapor density decreases very rapidly outside the probe space. The emission of the resonance light in the direction of the axis of the probe is used for absorption measurements.

There are two advantages in this approach. First, the vapor is contained in a well-defined volume and everywhere in the column, where metal vapor is present, electronic excitation takes place, which minimizes the self-absorption. Secondly, owing to the screening effect of the capillaries, the volume from which the light output originates is situated in the axis of the positive column discharge. In this region of the column the density of the exciting electrons