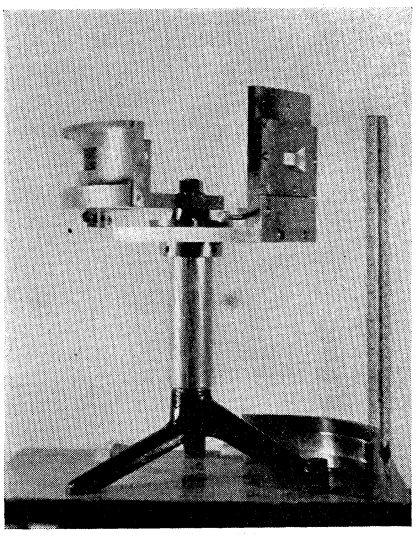

FIG. 1.

Very recently we have cut a slab of quartz parallel to the optic axis, ground it to a thickness of 0.21 mm and given it a radius of curvature of approximately 20 cm. Before bending, the quartz slab was plane and parallel to within 0.01 mm. The curvature was impressed upon this thin sheet of quartz by imprisoning it between two heavy metallic lamina machined to the required radius. The x-rays pass through an aperture (2 cm × 1 cm) cut in this crystal holder.

In addition to the crystal holder the spectrograph (Fig. 1) consists of a film holder and graduated circle which turn on the same vertical axis as the crystal holder. The film holder also consists of two heavy metallic lamina machined to one-half the radius of curvature of the crystal holder in accordance with the focussing condition outlined by Cauchois.[3] The circle is graduated in half degrees and with the help of verniers the positions of the crystal and film holders can be read to one minute of arc.

With molybdenum radiation excited under 40 kv and 15 m.a., a fluorescent spectrum of zirconium (Fig. 2) was obtained in two and a half hours. The secondary radiator was large enough to illuminate the entire crystal aperture for the first and second orders of ZrK. The first order $K\alpha$ doublet is visibly resolved.

The crystal planes which are effective in the reflection of the x-rays are those perpendicular to the optic axis. For these planes the second order reflection is stronger than the first because of the alternate spacing of oxygen and silicon atoms. Thus the effective grating constant, already small, is further reduced. The reflecting planes are approximately perpendicular to the surface of the crystal lamina and hence converge to a point near the center of curvature of the crystal.

The quartz crystal shows promise of being far superior to mica for this purpose. The luminosity of the instrument claimed by Cauchois for mica seems to be retained. In addition because of the good crystalline quality of quartz the spectra are sharp and clear which was not the case with the mica we used. Furthermore, because of the small grating constant of quartz the dispersion and resolution of the spectrograph have been greatly enhanced.

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[1] Y. Cauchois, J. de phys. et le rad. **4**, 61 (1933).
[2] E. Carlsson, Zeits. f. Physik **84**, 806 (1933).
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The Magnetic Moment of Caesium Determined from the Hyperfine Structure of the $6p\ ^2P_{\frac{1}{2}}$ State

The hyperfine structure of the line λ8761.35 ($6d\ ^2D_{3/2} - 6p\ ^2P_{1/2}$) in the arc spectrum of caesium has been investigated with a Fabry-Perot interferometer. This line shows two components which arise from the $P_{1/2}$ state, the splitting of the $D_{3/2}$ state being too small to observe. The separation obtained, corrected for mutual influence of the components is 0.035 ± 0.001 cm^{-1}. On allowing a ratio of 0.0278 between the interval factors of the $D_{3/2}$ and the $P_{1/2}$ states the separation of the $P_{1/2}$ state becomes 0.037 ± 0.001 cm^{-1}. By using this separation and applying Goudsmit's formulas a g value of 0.70 is obtained for caesium.

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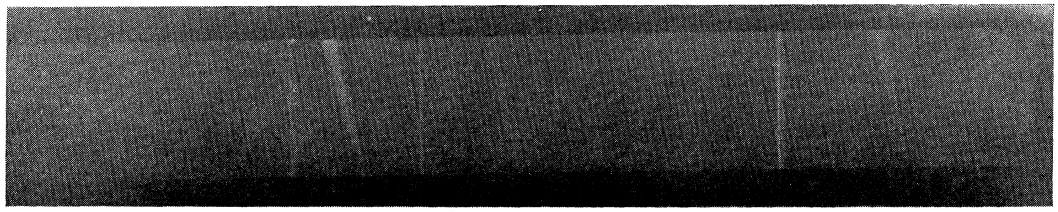

FIG. 2.