It is evident that these considerations will have no bearing on the present problem unless the field strength decreases very rapidly upward in spots. That this probably occurs is shown by the fact that the D-lines of sodium and the b-lines of magnesium are usually but slightly affected in the spot spectrum,[3] and are displaced through a very small distance when the Nicol is rotated. Thus, at the level represented by these lines, which attain elevations in the chromosphere probably not exceeding 5000 miles, the field strength is reduced to a small fraction of its maximum value.

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[3] Except for the strengthening of the wings, which may be produced by some cause other than a magnetic field.

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84. NOTE ON DIRAC'S THEORY OF MAGNETIC POLES

(*Phys. Rev.*, **95**, 1968, 1949)

In a note bearing the above heading, Professor H. A. Wilson[1] has described a simple method for finding out the value of Dirac's free magnetic poles. I may point out that this method was described by me nearly thirteen years ago[2] in a paper "On the origin of mass in neutrons and protons." I may just quote the result:

"It was Dirac who first showed that quantum mechanics demands the existence of free magnetic poles, having the pole strength (or magnetic charge) $ch/4\pi e = e/2\alpha$, where α=Sommerfeld fine-structure constant. Recently, the present author deduced the existence of free magnetic poles from very simple considerations. If we take a point charge e at A and a magnetic pole μ at B, classical electrodynamics tells us that the angular momentum of the system about

$$A \text{——} B$$

the line AB is just $e\mu/c$. Hence following the quantum logic, if we put this$=\frac{1}{2}\cdot h/2\pi$, the fundamental unit of angular momentum, we have $\mu = ch/4\pi e = e/2\alpha$ which is just the result obtained by Dirac."

[1] H. A. Wilson, Phys. Rev. **75**, 308 (1949).
[2] Ind. J. Phys. **10**, 145 (1936).