0.40 degree (0.28 cm^{-1}) for δ/k. With this value of δ the salt should exhibit a maximum in the specific heat, C, in the region of 0.16°K while in the "high" temperature region, where $C\propto T^{-2}$, C/R is about twice that of chrome alum. Since, moreover, the molar volume is some 2.5 times smaller than that of chrome alum,[7] the heat capacity *per unit volume* (which is the important quantity from the more practical point of view) is 5 times greater.

The theory of Hebb and Purcell[8] as developed for the alums when applied to this salt describes the observed behavior only approximately (as might be expected). The fit is good down to $T^*=0.4°$, below which the entropy falls off more and more rapidly than is predicted by the theory. It is interesting to note, however, that no maximum in the susceptibility was observed down to the lowest entropy obtained in these experiments ($S/R=0.3$).

This work will be continued and extended to other members of the isomorphous series, e.g., $(NH_4)_3FeF_6$, K_3FeF_6, etc. The authors are indebted to Dr. L. S. Singer, then at the Naval Research Laboratory, for originally arousing their interest in the ammonium salt described above and for communicating his paramagnetic resonance results to them prior to publication.

[1] See, for example, E. Ambler and R. P. Hudson, Repts. Progr. Phys. 18, 251 (1955).
[2] J. G. Daunt and W. L. Pillinger, Conférence de Physique des basses températures, Paris, September 2–8, 1955, Commun. No. 18 (Suppl. au Bull. de L'I.I.F, p. 158).
[3] C. V. Heer and C. J. Rauch, Commun. No. 25, p. 218 of reference 2.
[4] L. S. Singer (private communication).
[5] R. P. Hudson, Phys. Rev. 88, 570 (1952).
[6] J. M. Daniels and N. Kurti, Proc. Roy. Soc. (London) A221, 243 (1954).
[7] The structure of this salt is described by R. W. C. Wyckoff, *Crystal Structures* (Interscience Publishers, Inc., New York, 1948), Chap. IX. The chromic ions are situated on a face-centered cubic lattice, $a_0=9.0$ A. In the alums the magnetic ions are similarly placed, with $a_0=12.2$ A. The contribution to the entropy reduction due to dipole-dipole coupling is conveniently expressed in terms of a parameter τ [see J. H. Van Vleck, J. Chem. Phys. 5, 320 (1937), Eqs. (18), (20), and (35)]; we find $\tau=0.05$. The possibility of a significant exchange interaction was discounted for the reason that the salt obeyed the simple Curie Law very closely in the liquid He region.
[8] M. H. Hebb and E. M. Purcell, J. Chem. Phys. 5, 338 (1937).

Ionospheric Effects Produced by Solar Flare Radiation

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(Received February 8, 1956)

WITH reference to a recent paper by Sedra and Hazzaa,[1] there is now overwhelming evidence that ultraviolet radiation from solar flares does not affect the ionic density of the E and $F1$ layers to any marked extent except perhaps in extremely rare cases.[2] The "ion cloud," if such a term may be used, produced by the ultraviolet radiation from a solar flare extends over the entire sunlit hemisphere, and is at a height less than 100 km—not at 200 km as suggested by the authors. The 1929 Maris and Hulbert paper referred to was written at a time when the heights of the ionospheric layers, as well as their ion densities, were not regularly measured, and the solar flare effects on the ionosphere could only be guessed at.

The authors' illustration of a geomagnetic crochet is not typical. The interpretation of the ionospheric record shown in the paper is puzzling in that the "cloud" appearing at a virtual height of 200 km is either transparent (allowing reflections from the $F2$ layer to reach the receiver), or what is more likely, it is a sporadic E cloud located off the zenith at a height of about 100 km giving a recorded slant range of 200 km. In either case, it is probably not possible to determine a critical frequency (or an ion density) for such a "cloud."

Although the paper deals with solar flare radiation, solar observational data are not given. So far as can be determined (it is not clear whether the times listed are local or Greenwich), no solar flares were observed anywhere else on the dates and near the times listed. Further, no magnetic crochets (solar flare effects) are given in the IATME Bulletins[3] for the dates and times listed.

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Paramagnetic Resonance in As-Doped Silicon

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EXPERIMENTS involving long relaxation times in As-doped Si have been previously reported.[1] The experiments had been interpreted as suggesting a large spin polarization of the As donor nuclei. Further studies carried out on an equipment similar to the first, and on the same silicon sample containing 1.3×10^{17} As/cm^3, lead us to believe that most of the effects previously observed, as well as some new effects, can be more satisfactorily explained on the basis of a long electronic relaxation time and accompanying adiabatic rapid passage behavior.

One way in which it was directly established that the 16-second relaxation time, previously attributed to the