observations to include other latitudes and other elevations above sea level.

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Stewart, John Q.,* Michael Ference,† John J. Slattery,† and Harold A. Zahl.† Radar observations of the Giacobinid meteors.

Report is made of radar observations on U. S. Army equipment made on the night of 9 October 1946 at the peak of meteor activity from the Giacobini-Zinner comet. Observations were made in the vicinity of Belmar, New Jersey; Arco, Idaho; White Sands, New Mexico. Equipment used covered a frequency range of 100 to 10,000 mc. Successful observations of abnormal responses were made at White Sands, New Mexico. Greatest response was obtained in the 100 mc. band. Photographs taken on one radar showed a count of 115 during a 23-minute period with indicated radar ranges varying from 25 to 155 miles. Of the 115, 18 indications showed a persistence of 3 to 27 seconds, while the others are from 1 to 3 seconds in duration. All echoes showed a spread of approximately 2 to 4 miles indicating that reflection is occurring only from a short length of ionized air a few miles long at most. Absence of motion in all series but one indicates that the origin of the echo is not from the cap of the meteor but rather represents a train phenomenon. One case at an indicated radar range of 30 miles shows a change in range of 6 miles in 9 seconds. In other respects this echo looked exactly like all the other echoes. It is assumed, therefore, that this echo is also from the train and not the cap. It is hard to believe so rapid a motion could exist at only 30 miles, suggesting, therefore, that the indication may be on the second radar return, which would correspond, in the particular case, to a range of 340 miles.

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Thomas, R. M. Application of the supersonic concept to astronomy—the solar atmosphere.

Considerations originally aimed at interpreting the "coronal streamers" (Pettit's type VI) in terms of superthermic velocity concepts have led into a discussion of the concept of very high velocity turbulence in the chromosphere. Grave doubts are expressed as to whether any turbulence in which the mean turbulent velocity is in

excess of the mean thermal velocity of the gas atoms and molecules can exist, the doubt arising from physical arguments and terrestrial experience. The theory of chromospheric turbulence is however postulated explicitly upon this superthermic turbulent velocity; and it is therefore suggested that such a theory is erroneous, and the observed Doppler line widths are really thermal widths. It is suggested that the earlier objections to this interpretation are in error by reason of non-discrimination between temperature defined on the basis of radiation measures and on kinetic measures; and that mechanisms such as high velocity jets, or solar eruptions, are likely to have a considerable "transition distance" before thermal motion is transformed into the other degrees of freedom. It is proposed that the introduction of energy and momentum by the conversion of directed mass motion into random thermal motion may contribute largely to the support of the chromosphere. A discussion of an illustration of this transition distance for a jet is presented briefly. It is further suggested that such "eruptive" mechanisms provide a mechanism of rapid energy and momentum transport from lower regions of the star.

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Tousey, Richard, C. V. Strain, F. S. Johnson and J. J. Oberly. The solar ultraviolet spectrum from a V-2 rocket.

As a portion of the upper atmospheric research program in progress at this laboratory, the solar ultraviolet spectrum was photographed from a V-2 rocket. Successful spectrograms were obtained at 35 altitudes ranging from 1 to 88 km. A vacuum spectrograph was designed for the purpose and employed a grating of 40 cm radius and 15,000 lines to the inch. A lithium fluoride sphere of 2 mm diameter was used in place of the slit and the record was made on a 25-foot length of 35 mm film. The resolution was 3 Å or better. At 34 km ozone absorption obscured the spectrum between 2650 Å and 2260 Å, but a definite spectrum was recorded from 2260 to 2100 Å. The spectrum at 55 km was photographed through the entire region hitherto obscured by the Hartley band of ozone. Among prominent features of the spectrum were the strong absorptions at 2800 and 2852 Å due to MgII and MgI, respectively. The preliminary intensity distribution at 55 km, calculated from the densitometer trace with the aid of a carbon arc as standard source, showed