A revised mathematical model of blast-induced translational effects was discussed, which has two advantages over the earlier models: (1) arbitrary blastwave forms can be used and (2) the effects of ground friction can be included if the translating object is tumbling over smooth, flat ground. For relatively short duration blast waves (such as those produced by HE), the single most important blast-wave parameter needed to predict translation is the dynamic-pressure impulse.

Experiments involving the translational velocities of steel spheres were described, the results of whoch were used to estimate dynamic-pressure impulse by two methods; the first was accomplished by means of the mathematical model and second, simplified technique only required a least-squares analysis of the experimental data. The experimental sphere velocities were compared to the velocities computed with the translation model using the blast waves predicted by various authors, and the discrepancies were discussed.

In order to understand the process of declerative tumbling, a series of "calibration" experiments were performed. Concrete blocks, stones, and animals were dropped form a truck traveling at various speeds, and the distances betweeen bounces and the total displacements were measured. From these experiments an "average ground friction" term was derived and included in the translation model.

The model was tested using data obtained in experiments where dummies and goats were displaced by the wonds from a 500-ton TNT detonation. The computed velocities and displacements were in reasonable agreement with the experimental results except in those cases where anomalous nonradial winds were present. The model could not be adequately tested for the latter cases, since appropriate blast-wave parameters were not available.

In another experiment, the velocity distribution of the larger fragments from a concrete-block wall blown apart by the winds form an 11 kt nuclear shot was reconstructed from the measured displacement of the fragments and the "calibration" experiments. The geometric mean velocity of the fragments was shown to be in good agreement with the predicted velocity for a single loose block situated in free air.

A brief description was given of a mathematical model which was developed to dtudy the mechanisms of decelerative tumbling for stones, blocks, and animals and to permit extrapolation to greater velocities than have heretofore been obtained experimentally. The predictions of the model were shown to be in good agreement with the results of the "calibration" experiments for block translations.

Finally, certain other translational situations were briefly discussed. These were: those involving secondary missilies generated by near-ideal and non-ideal blast waves, translation in and near structures, and crater ejecta.