and early evening periods of the day. While it may be possible, therefore, that some slight benefit may result from hay cut in the afternoon compared to early morning, this superiority does not appear to approach the 19% gain in dry matter reported by Curtis. Moreover, practical considerations of methods of hay making must be balanced against any advantages of late afternoon cutting before specific recommendations for time of cutting can be made.—T. E. Woodward and J. B. Shepherd, Bureau of Dairy Industry, and H. M. Tysdal, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Dept. of Agriculture.

AFTERNOON VS. MORNING CUTTING OF ALFALFA: COMMENTS ON NOTES BY WOODWARD, SHEPHERD, AND TYSDAL AND BY WILLARD

According to the editorial policy of the Journal, I have had the privilege of seeing two notes which oppose the conclusion presented in my paper1, and I appreciate the opportunity to submit replies to these two papers.

It is true that the dry weight measurements reported by Woodward, Shepherd, and Tysdal do not show any significant differences between morning and afternoon cuttings of alfalfa, and in this respect do not support my findings. But it is obvious from their data in both Tables 1 and 2 that their plots were too variable to show significant differences in total dry weight. The figures they present point to a loss in dry matter during the day and a gain at night, which, of course, is impossible except under the highly improbable situation in which transport and respiration during the day exceeded photosynthesis, and transport from the roots to the tops takes place at night. But the fact that their dry weight findings show no significant differences can hardly be claimed to refute my findings in which 7 out of 12 separate sets showed statistically significant gains during the day and only 2, with highly variable plots, showed a loss comparable to theirs, but this loss during the day, like theirs, was not statistically significant.

Although their dry weight measurements do not show significant differences between morning and afternoon, their data on percentage ash, percentage nitrogen, and percentage carotene, as well as those on nitrogen-free extract, clearly point to a gain in total dry matter and digestible material during the day and loss at night in amounts of the same magnitude that I observed and reported in my paper. Therefore I disagree with their two statements, "... these independent tests... are not in agreement with the results obtained by Curtis..." and "Considering all data, there is no evidence of any increase in yield of dry matter..."

1Curtis, Otis F. The food content of forage crops as influenced by the time of day at which they are cut. Jour. Amer. Soc. Agron., 35:401-416. 1944.