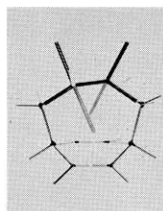
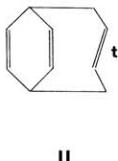
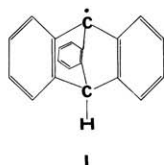


Molecular Models

The utility of Dreiding molecular models is well known to chemists. However, the very rigidity and resistance to certain types of rotation that make this type of model so useful in the study of stereochemistry make it impossible to make models of certain interesting strained or "twisted" species, such as the triptycyl radical (I) and the triene (II) in which the double bond in the eight-membered ring is trans. The combination of stainless steel Dreiding stereomodels (Swissco, available in the U.S. from Rinco Instrument Co., Inc., Greenville, Illinois) with inexpensive plastic Framework Molecular Models (available from Prentice-Hall, Englewood Cliffs, New Jersey) makes it possible to prepare models of strained species such as I and II (see photo). The combination of these two types of models also permits the representation of atomic and molecular orbitals in an unambiguous fashion. The orbitals of the "twisted" *trans*-double bond of II can be represented by colored tubing, with different colors corresponding to the sign of the wave function in different regions of space. (In the model of II in the photograph the tubing representing orbitals is longer than scale to emphasize what would be more obvious in a color photograph.)



The plastic tubing of the plastic models can be cut to scale using the Angstrom scale available with the stainless steel models or the plastic tubing can be used simply as a connector. In cutting to scale allowance should be made for the fact that the tubing will contact the soldered connection of the stainless steel models. In some highly strained molecules it is advisable to wrap the rod of the

stainless steel model with transparent tape; the tube does not require this precaution.

Models of this type are very useful in illustrating the principle of conservation of orbital symmetry (the Woodward-Hoffman rules) recently elaborated by R. B. Woodward and Roald Hoffman [See HOFFMAN, R., AND WOODWARD, R. B., *Accounts of Chemical Research*, **1**, 17 (1968) and the articles cited therein.]

WILMON B. CHIPMAN

BRIDGEWATER STATE COLLEGE
BRIDGEWATER, MASSACHUSETTS 02324