

THE SHEET WEB AS A TRANSDUCER, MODIFYING VIBRATION SIGNALS IN SOCIAL SPIDER COLONIES OF MALLOS GREGALIS. J. W. Burgess\* (SPON: P. N. WITT). North Carolina Mental Health Division, Raleigh, N. C. 27611.

The sheet web of Mallos gregalis tailors vibrations to fit the colony's behavior patterns. In a social context, it is important to locate acceptable prey on the web and differentiate it from other colony members. B. Krafft has identified close-range chemotactic signals inhibiting predation in social spiders (Agelena consociata). Mallos gregalis on three-dimensional sheet-webs in nature and the laboratory orient to struggling prey at distances over 10 cm, but do not orient to web vibrations caused by colony members. Electronically generated vibration transmitted through the web to a magnetic pick-up shows that transmission is limited to a band between 50-500Hz (measured on an oscilloscope), and sine-wave vibration is amplified at peaks within that band. Pure tones introduced on the web over a range of 10-100,000Hz elicit predation behavior (orientation and directional movement) only within the 50-500Hz band, proportional to the web-response curve. Measured on the web, vibration of a trapped housefly is prominent within the web-response band, recorded on a Brüel and Kjaer audio analyzer, while this vibration measured off web is spread over a wide frequency range, from 50-5000Hz. The fly's vibration is modified by the web into a signal to which spiders readily respond, but other spiders moving on the web do not generate measurable vibrations within this band. Since intra-colony predation is not seen, it is suggested that the filter/amplification characteristics of the web act to stimulate fly predation, while inhibiting inter-spider predation. (Supported by NSF Grant GB25274 to P. N. Witt.)