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RHYTHMIC ACTIVITY OF THE WEB-BUILDING SPIDER, AND ITS DISTURBANCE BY DEXTRO-AMPHETAMINE. Peter N. Witt, Charles F. Reed and Robert R. Jackson. N. C. Department of Mental Health, Research Division, Raleigh, N. C. 27611, USA

Can analysis of drug effects on invertebrate behavior contribute to our knowledge about a drug's way of interfering with central nervous system function? Daily construction of the orb web by the spider Araneus diadematus Cl. can be regarded as a rhythmic process, where the same movement pattern is repeated many times. Early observations (Witt, 1949) had established that webs built by spiders several hours after the oral application of 300 mg/kg d-amphetamine compared to controls had significantly increased irregular central radial angles and spirals. No data have so far been available on the timing which underlies construction of a regular or irregular web. By examining the microscopic structure, amphetamine webs can be shown to possess in addition to many elaborate "normal" thread connections, some connections which are not securely fastened. Time-sequence analysis of the construction process from movies produced for control animals a relatively constant figure for the laying of each spiral section, while spiders after d-amphetamine alternated erratically between rapid and slow periods. This as well as the observation that all probing movements were preserved leads to the conclusion that the drugged spider remains undisturbed in each subprogram of the motor pattern, but is made incapable of properly timing the rhythmic process of repetition. (Supported in part by NSF grant GB-6246.)