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While there is asymmetry in the nervous system of several invertebrates and asymmetry in CNS-regulated motor behavior, there appears to be little evidence for lateralization, which Webster[1] defines as "preference in use of homologous parts on one lateral half of the body over those on the other: dominance in function of one of a pair of lateral homologous parts." The frequent example in vertebrates is handedness; and there is evidence for developmental changes in ontogeny and evolution. The cross-spider, *Araneus diadematus* Clerck, leaves a daily record of intricately patterned motor behavior in the orb web; the web-geometry is highly independent of experience[2] and it is oval asymmetric in the

FIGURE 1. Web built by an adult female spider (*Araneus diadematus*) in the laboratory.

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North/South as well as the East/West direction (see FIGURE 1, a web built by an adult female [*Araneus diadematus*] in the laboratory, with scale in the upper right corner, indicating gravity, and 20 mm original distance). It has been reported[3] that under weightless conditions in Skylab II a web was built that showed an even distribution of radial angles in all directions. In addition, we have now turned frames containing spider webs once a week horizontally 180°, so that laboratory windows that had been on one side of the web, were now on the other side. The asymmetry of the horizontal hub position changed significantly ($p < 0.01$) when the frames were turned, and did not change measurably during the days webs were rebuilt without turning. Both the Skylab data and the results of the turning experiment are seen as evidence that the motor behavior asymmetry in web construction is a response to asymmetric environmental cues rather than an indication of "handedness" in the spider. Experiments with removal of the right or left first leg and/or second leg of web-building spiders lead to the same conclusion;[4] and central nervous system lesions showed the same results.[5] If one assumes on the basis of the present evidence that while asymmetry is frequent in invertebrates, lateralization does not occur, it becomes interesting to speculate what specific functional requirements formed the basis for lateralization in certain vertebrates.

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