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The forelimb of *Tyrannosaurus rex*: a pathetic vestigial organ or an integral part of a fearsome predator? SCOTT A. LEE, University of Toledo, JOSHUA THOMAS, Clarkson University — The function of the forelimb of *Tyrannosaurus rex* remains a controversial topic since it was too short to transfer food directly to the mouth. Since *Tyrannosaurus rex* was bipedal, the forelimb was not involved in locomotion. Suggestions for its possible use include providing an initial push for a laying animal to stand or to hold position during mating. We report numerical calculations performed to determine the moment of inertia of the forearm and the torques generated by the muscles of the arm, based on three-dimensional representations of the forelimb. Our results imply that the forelimb was capable of very high angular accelerations, on the order of 130 radians/s^2. This corresponds to a tangential acceleration of the manus on the order of 90 m/s^2 or about 9g, indicating that the manus could be moved extremely quickly to control a struggling prey animal immediately before the death blow was delivered by the teeth of *Tyrannosaurus rex*. Rather than a pathetic vestigial organ, these calculations suggest that the forelimbs were an integral part of the predation tactics of *Tyrannosaurus rex*.

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