

Student #3

I was behind IST, on the soccer field.

It was on the 16th of October, around 3:00 p.m.

It was hot, and the grass was pokey.

I observed bugs crawling around. It was hard, but I was trying to see the leg movements. I want to know if their legs move differently when they run, like people do. Do different bugs have different leg movements? Does the number of legs affect their movement patterns? I also want to know how fast they can move.

The leg movement is so much more complex than it looks. In order for the legs to work in a bug's body, everything has to function perfectly. Due to their small size and fragile legs, which are actually very easy to break, it is much harder for them to stay alive.

Though walking is part of many insect behavior patterns, the mechanism of insect walking has received relatively little attention in recent years. As a preliminary step to a later investigation of neuromuscular coordination in insects, the normal pattern of walking movements in cockroaches and other insects has been studied. The results obtained, as well as an account of the functional anatomy of the insect leg, are presented in this paper. The forces involved have not been measured, but a preliminary analysis of the mechanics of walking has been made with the help of stills from cinematographic films. Cinematography greatly facilitates such an investigation.

Borelli (1680), in his *De motu animalium*, did not provide an accurate picture of insect leg movements. However, his suggestion concerning the order of protraction has been substantiated in the present research. In reviewing Borelli's account, Demoer (1890) was very critical of the assumption that it would be advantageous for the three ipsilateral legs of a hexapod to lift in the order: "initium motus fieret a posteriori, cui succederet medius et ultimo anticus." This suggestion was based not on observation but on the theoretical principle that the hind leg should move first in order to propel the center of gravity forward before the other legs were lifted. Demoer maintained that the foreleg of one side is lifted simultaneously with the middle leg of the opposite side, while the ipsilateral hind leg is raised a little later. However, all three legs of the triangle are placed on the ground simultaneously. ([The Co-Ordination of Insect Movements June 1st 1952](#))