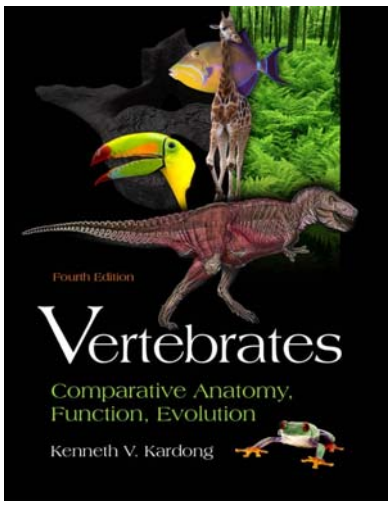



# Tracking the Dinosaurs

**Follow up in Textbook: figure 1.34, Chapter 1**

## A. Objective:

Interpret the behavior of a dinosaur from its tracks

## B. Textbook Reference:

See textbook Figures 1.34 and 3.38 after completing this exercise.

## C. Introduction:

The figure below shows recently discovered, 163 million-year-old (Jurassic) dinosaur tracks from a quarry in Oxfordshire, England. The tracks appear to be from Megalosaurus, a theropod dinosaur from the same group that includes Tyrannosaurus, although this species was slightly smaller.

The figure shows such a theropod dinosaur (A), a photograph of the tracks (B), and a sketch of these continuous tracks (C). A scale bar (2 meters) is included. The left (L) and right (R) tracks are indicated.

## D. Preparation & Procedures:

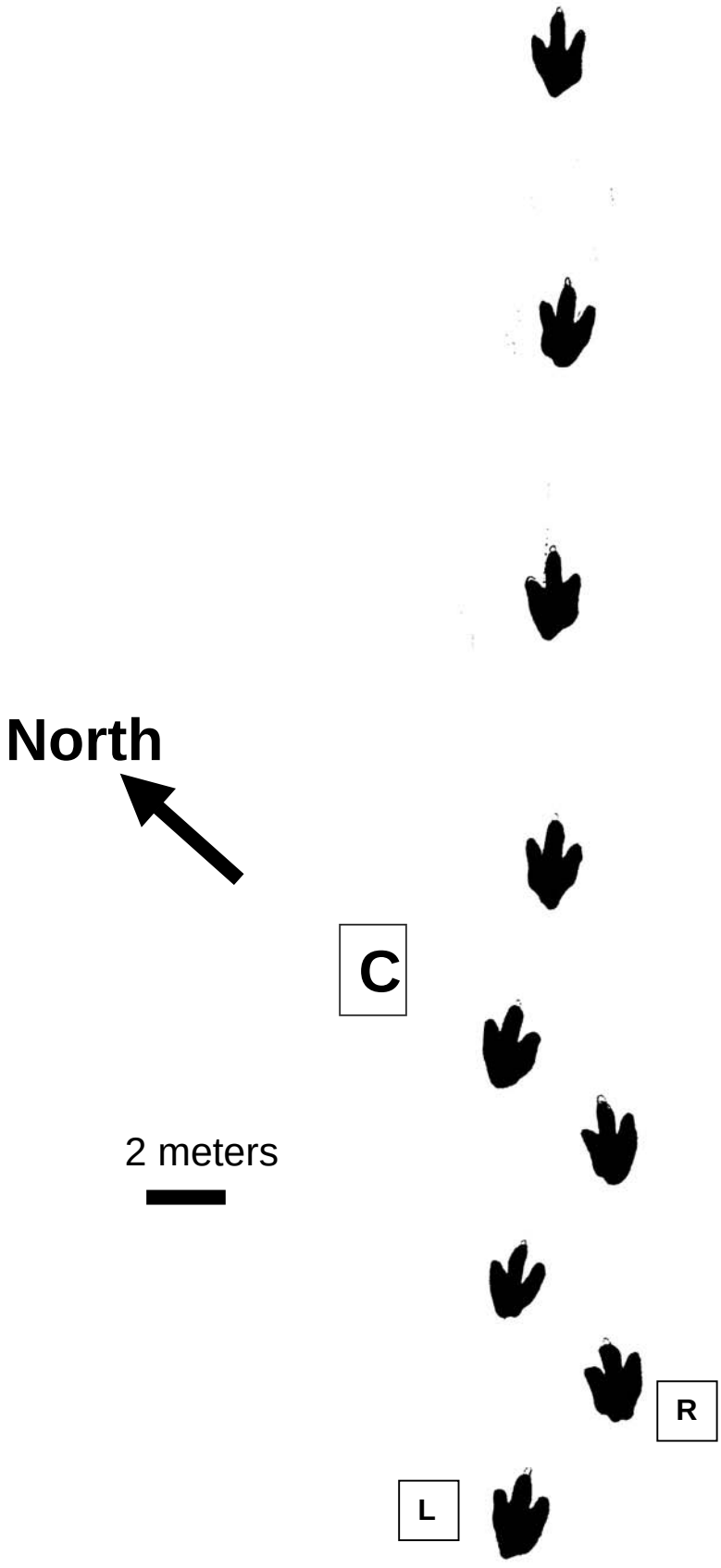
Without textbooks, work in groups of 2-4 to analyze and discuss this trackway.

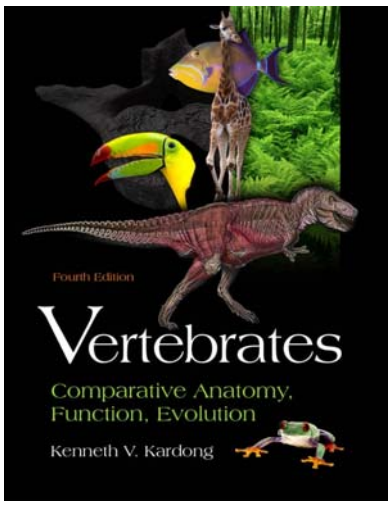
## E. Synthesis:

Imagine yourselves as paleontologists coming to these tracks and seeking an interpretation.

1. What can you reasonably deduce about what this dinosaur was doing the day it made them?

2. What can you deduce about this dinosaur's locomotion?


North
C
2 meters
R
L




# Instructor's Guide

## Tracking the Dinosaurs

**Follow up in Textbook: figure 1.34, Chapter 1**

## A. Background

1. This exercise is a complex analysis of relatively simple data. The simplicity can facilitate team building early in the course.

2. Consider using this exercise to accompany:

   - lectures on animal locomotion and

   - laboratories on skeletal appendages

## B. Materials Preparation

This self-contained exercise requires no preparation of materials. However, you may wish to consider presenting other sets of tracks from dinosaurs or other animals for further analysis. For example, a browser image search of "dinosaur tracks" should generate many options.

This exercise is inspired by:
Day, J. J., D. B. Norman, P. Upchurch, and H. P. Powell. 2002. Dinosaur locomotion from a new trackway. Nature 415:494-495.

BBC featured this research and added more figures, including some of the trackway and of the likely dinosaur that made them. You might like to add this to your in-class use of this exercise:

http://news.bbc.co.uk/1/hi/sci/tech/1791709.stm

## C. Facilitating Tips:

1. This exercise works best if the student teams can mull it over themselves.
2. They should notice some obvious features: Direction of travel, change in footfall pattern.
3. Having compasses and rulers available encourage the teams to move from "impressions" to quantitative measurements—changes in stride length (almost doubles); angle of foot to line of travel.

## D. Assessment - Advice for Evaluating Responses

Student observations might include:

1. Dinosaur was bipedal
2. Travel in a Northeasterly direction
3. Changed from slow to fast movement (about 2 meters per stride to over 4 meters per stride)—walking to running.
4. Footprints from pigeon-toed when walking to more forward orientation.
5. Limbs splayed when walking; more under the body when running.
6. No tail drag

## E. Additional Considerations

Consider asking your students to further analyze and interpret the footprints in this photo.

www.isp.msu.edu/photocontest/2001/faculty/image/J-in-awe-of-d_lar.jpg

Methods to calculate speeds from trackways can be found at:

http://www.bhc.edu/academics/science/harwoodr/Geol101/Labs/DinosaurTracks/