



MIGRATIONS, GIGANTOTHERMY AND ELEVATED
AEROBIC METABOLISMS--WHICH BEST EXPLAINS
HOW DINOSAURS COPE WITH THE WINTERS OF THE
FAR NORTH?

Gregory S. Paul (Baltimore, Maryland)

Did the dinosaurs of Alaska and the Yukon move away from Arctic winters? If not, then how did they survive the long winter nights? Migrations to find the winter sun required extremely long round trips of up to 9000 km to Montana and back.

Gigantothermic dinosaurs with low aerobic scopes could not have walked fast enough to make such trips feasible. Even the longest migrating animals of the modern Arctic, caribou, remain in the same region year round rather than try to move away from today's severe polar winters. It is unlikely that polar dinosaurs moved further to escape the milder Cretaceous winters. Many Arctic dinosaurs were too large to hibernate, and they were poorly suited for using water as a thermal buffer. Recent computer models show that gigantothermic dinosaurs with low aerobic scopes would not have tolerated the absence of solar heat and chilling storms. Nor did fermentation of gut contents provide adequate internal heat. If dinosaurs had minimal aerobic metabolisms elevated above the reptilian level then they could have easily coped with Cretaceous winter conditions. This means that the hypothesis of tachymetabolic polar dinosaurs best fits the requirements of Ockham's razor, alternate scenarios are needlessly complex. Fat deposits provided energy to help compensate for the scarcity of winter fodder, but mortality rates would have been higher than in other seasons.

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