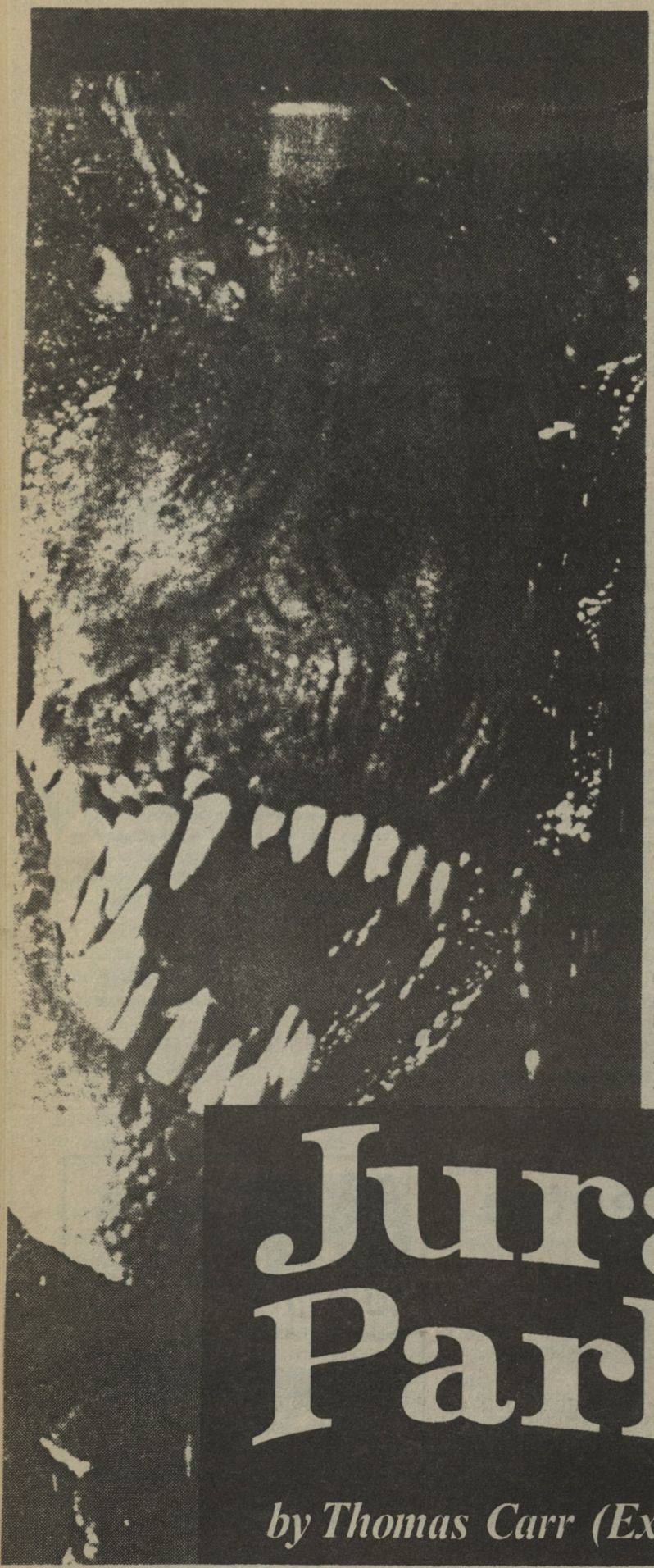

Jurassic Park: Accurate recreation or fiction?

by Thomas Carr (Excalibur)

Steven Spielberg's *Jurassic Park* is an ambitious $65 million film that has turned out to be astonishingly successful in terms of accurately recreating dinosaurs.

The main achievement of *Jurassic Park* is the creation of animals, not monsters. The lifelike result of the dinosaurs derives not only from their anatomical detail, breathing and fluid movements, but also from their behaviour. The dinosaurs interact, exhibit curiosity, vocalize, communicate, herd, flock and organize themselves as animals. Since the dinosaurs in the film are intended to be scientifically accurate, they deserve critical look. And there are a few problems with the science portrayed in the film.

For instance, Brachiosaurus could not rear up as it did in the film, although other sauropods (brontosaurs) could have. Brachiosaurus had an advantage over other sauropods:forearms longer than hind limbs. Normally, the reverse is true for a dinosaur. The longer forearms allowed Brachiosaurus to get out-of-reach branches without having to expend the energy and endure the strain of standing on its hind legs.

Frightening as it was, the Tyrannosaurus rex in the film had some minor anatomical inaccuracies. Actual T. rex skulls do not feature triangular peaks over the lizard king's eyes. The bones around its eyes were rounded; thus, T. rex would have given its prey an emotionless stare, like that of a great white shark or shrike. Ironically, it was the small, docile, plant-eating dinosaurs-the ornithopods-with the "angry" eagle-ridged eyes.

The *Jurassic Park* T. rex exhibited unusual flexibility for a tyrannosaur. The movie rex's tail was too flexible. As a rule, tyrannosaur tails are only flexible at the base, but rigid in the latter half. Lateral movement was prevented by increasingly elongate processes (zygapophyses) that joined vertebra to vertebra further down the tail.

The movie T. rex displayed an unlikely posture derisively termed "The Cossack Dance" wherein the thighs are splayed outwards from the midline of the body. In actual fact, the thigh bones' ball joint rests on an elevated neck, forcing the ends of the thighs slightly outward, away from the midline of the body. As a result, the shins are oriented inward, tucking the feet under the body midline. The muscles attaching the pelvis to the thigh bones prevented gross lateral movement, restricting leg movement to the fore-and-aft.

The *Jurassic Park* rex has a terrible slouch resulting from thighs oriented too horizontally and a nearly horizontal neck. T rex's neck vertebrae articulate in an S-curve, to hold the head well above the backbone. In addition, the arms of the movie rex are too wide apart and spindly. A recent study of T. rex forelimbs indicate that they were well-muscled and exceptionally powerful. I have held the cast of the largest T. rex limb ever found-from a 41-footer-which matched my arms in length. Imagine your arms curling over 200 pounds each!

The only paleoartist to produce accurate T. rex restorations is Toronto's Garfield Minott. His model depicts birdlike eyes without "horns"; stout forelimbs at the front of the chest; thighs in a vertical