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Complexities in the evolution of birds from predatory dinosaurs: *Archaeopteryx* was a flying dromaeosaur, and some Cretaceous dinosaurs may have been secondarily flightless. GREGORY S. PAUL, 3109 N. Calvert St., Baltimore, MD 21218, USA.---Reanalysis of the remains of *Archaeopteryx* show that it was a small dromaeosaur in many details of the palate, braincase, tail, and pelvis, and had a semi-didactyl foot with a hyper-extendible second toe. The skull was not kinetic in the avian manner, and most or all of its avian characters are also found in other theropods. Both *Archaeopteryx* and terrestrial dromaeosaurs had avian characters that the other lacks--including uncinat processes and a large breastplate in the latter--so it is not clear which group was closer to birds. Many other Cretaceous predatory dinosaurs had additional avian characters that *Archaeopteryx* and dromaeosaurs lacked. Troodonts had a near avian braincase and ankle, and an advanced palate; the skull of oviraptors was nearly avian. Further complicating phylogenetic analyses are flight related characters such as large reflexed coracoids, large furculae, large breastplates, folding arms and modified tails present in protoavian theropods such as dromaeosaurs, troodonts, oviraptors, and therizinosaurs. Mononykians appear to have been basal birds. The exact interrelationships of these dinosaurs and basal birds appears to be complex and in many regards obscure. A proposed scenario of bird evolution starts in the Triassic with the appearance of increasingly aerobically capable predatory dinosaurs, and some possible bird-mimics. An absence of flying bird remains in pterosaur and insect bearing sediments suggests the former were absent or very rare in the Triassic and most of the Jurassic. During the Triassic and/or Jurassic small, semi-arboreal predatory dinosaurs developed inter-branch leaping into flight, and evolved large brains and binocular vision in the process. It is possible that flight arose once or multiple times, and that *Archaeopteryx* is or is not a member of the true avian clade. From the first flying forms evolved short tailed birds, which first appear in the early Cretaceous. At the same time, some of the flying dinosaurs lost flight, resulting in an array of sophisticated, intelligent terrestrial predatory dinosaurs that became common in the Cretaceous.